Broxtowe Borough COUNCIL

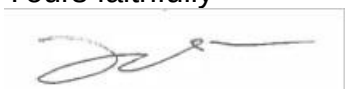
Monday, 13 July 2026

Dear Sir/Madam

A meeting of the Cabinet will be held on Tuesday, 21 July 2026 in the Council Offices, Foster Avenue, Beeston, NG9 1AB, commencing at 6.00 pm.

Should you require advice on declaring an interest in any item on the agenda, please contact the Monitoring Officer at your earliest convenience.

Yours faithfully



Zulfiqar Darr
Chief Executive

To Councillors:

M Radulovic MBE (Chair)	T J Marsh
G Marshall (Vice-Chair)	J W McGrath
G Bunn	S Paterson
T A Cullen	V C Smith
R D MacRae	E Williamson

A G E N D A

1. Apologies

   To receive apologies and to be notified of the attendance of substitutes.

2. Declarations of Interest

   Members are requested to declare the existence and nature of any disclosable pecuniary interest and/or other interest in any item on the agenda.

   Further information can be found at: Member Code of Conduct of Broxtowe Borough Council

3. Minutes (Pages 5 - 12)

   Cabinet is asked to confirm as a correct record the minutes of the meeting held on 30 June 2026.

4. Scrutiny Reviews (Pages 13 - 16)

The purpose of this report is to make members aware of matters proposed for and undergoing scrutiny.

5. Resources and Policy

5.1 Local Government Reorganisation (Pages 17 - 20)

To provide Members with an update on the ongoing preparatory work being undertaken across Nottingham and Nottinghamshire in relation to Local Government Reorganisation.

5.2 Crisis Resilience Fund Policy (Pages 21 - 48)

To consider and recommend the implementation of the Crisis and Resilience Fund Housing Payment Policy to replace the existing Discretionary Housing Payment policy.

5.3 Citizens Advice Nottinghamshire Central and South (Pages 49 - 56)

To provide Cabinet with an update on activity at the Broxtowe Division of Citizens Advice Nottinghamshire Central and South and approve the release of the third year of grant aid funding as approved by Cabinet in July 2024.

5.4 Complaints Reports 2025/26 (Pages 57 - 144)

To provide Members with a summary of complaints made against the Council.

6. Economic Development and Asset Management

6.1 Fire Risk Management Programme - Leaseholder Consultation and Future Charges (Pages 145 - 148)

For Cabinet to consider the next course of action regarding the utilisation of Section 20 consultation with leaseholders for remedial actions within the Fire Risk Management Programme.

6.2 University of Nottingham Retrofit Roadmap (Pages 149 - 522)

To provide Members with an overview of the key findings from the University of Nottingham Housing Decarbonisation Report, Local Area Energy Plan (LAEP) and the East Midlands Combined Counties Retrofit Strategy, and to demonstrate how these reports will collectively support future housing retrofit, decarbonisation and investment decisions across the Borough.

7. Housing

7.1 Additional Housing Complaints Officer (Pages 523 - 526)

To seek Cabinet approval for an additional Housing Complaints Officer

8. Environment and Climate Change

8.1 Parks and Play Strategy (Pages 527 - 728)

To seek approval to undertake a public consultation on the Council's revised Parks and Play Strategy.

9. Leisure and Health

9.1 Review of Disabled Facilities and Additional Grants Policy (Pages 729 - 768)

To review the criteria within the existing Disabled Facilities and Additional Grants Policy (Private Dwellings).

9.2 Fit and Proper Person Policy - Private Sector Housing Licensing (Pages 769 - 792)

To seek approval for a policy to consider whether applicants applying for a licence or involved in the management of a licensed property are considered to be fit and proper.

9.3 Annual Food Safety Service Plan & Occupational Safety Work Programme 2026-2027 (Pages 793 - 818)

To advise Members and seek approval for the annual Food Safety Service Plan and Occupational Safety Work Programme 2026-2027.

9.4 Annual Air Quality Status Report 2026 (Pages 819 - 924)

To advise Members of the latest Air Quality Status Report which has been submitted to the Department of Food Environment and Rural Affairs (DEFRA).

10. Cabinet Work Programme (Pages 925 - 926)

Cabinet is asked to approve its Work Programme, including potential key decisions that will help to achieve the Council's key priorities and associated objectives.

11. Exclusion of Public and Press

The Committee is asked to RESOLVE that, under Section 100A of the Local Government Act, 1972, the public and press be excluded from the meeting for the following item of business on the grounds that it involves the likely disclosure of exempt information as defined in paragraphs 1, 2, and 3 of Schedule 12A of the Act.

12. Cabinet Housing Delivery Update (Pages 927 - 934)

CABINET

TUESDAY, 30 JUNE 2026

Present: Councillor M Radulovic MBE, Chair

Councillors: G Marshall (Vice-Chair)
G Bunn
T A Cullen
T J Marsh
S Paterson
V C Smith
E Williamson

12 APOLOGIES

Apologies for absence were received from Councillors R D MacRae and J W McGrath.

13 DECLARATIONS OF INTEREST

There were no declarations of interest.

14 MINUTES

The minutes of the meeting held on 2 June 2026 were confirmed and signed as a correct record.

15 SCRUTINY REVIEWS

Cabinet noted the matters proposed for and undergoing scrutiny.

16 RESOURCES AND PERSONNEL POLICY

16.1 LOCAL GOVERNMENT REORGANISATION

Cabinet noted the update on the Local Government Reorganisation. It was stated that internal meetings would include other group leaders.

16.2 SENIOR MANAGEMENT RESTRUCTURE

Following the recent appointment of the permanent Chief Executive and the interim Directors, this report recommended the current interim management structure being made permanent. The report also recommended the next steps in appointing permanently to the four interim Chief Officer posts. Cabinet noted the use of the Chief

Executive's delegation powers to re-allocate the delegated powers to the newly appointed interim Directors.

RESOLVED that:

1. **The permanent senior management structure, as outlined in Appendix 1 of the report, be approved.**
2. **The Chief Executive's recommendation to convene a Chief Officers' Appointment Committee to agree the process for making permanent appointments to the four interim Chief Officer posts be approved.**

Reason
This is in accordance with all of the Council's Corporate Priorities.

16.3 PERFORMANCE MANAGEMENT REVIEW OF BUSINESS PLANS - OUTTURN REPORT 2025/26

Cabinet noted a report which outlined progress against outcome targets linked to Corporate Plan priorities and received an update as to the latest financial performance as measured against the budget. Areas of concern were highlighted, and it was stated that there were ambitious targets within the report.

16.4 STATEMENT OF ACCOUNTS UPDATE AND OUTTURN POSITION 2025/26

Cabinet was updated on the revenue and capital outturn position for 2025/26 and provided with an update on progress with the preparation of the draft annual statement of accounts for 2025/26.

The accounts for 2025/26 had been finalised, subject to audit, and showed an underspending on the General Fund revenue account of £2.506m and an overspend on the Housing Revenue Account (HRA) of £276k when compared to the revised estimates. There was praise for the officers who had prepared the report, and it was highlighted that these were difficult times for local government finances.

RESOLVED that:

1. **The accounts summary for the financial year ended 31 March 2026, subject to audit, be approved.**
2. **The revenue budget carry forward requests outlined in the report be approved and included as supplementary revenue estimates in the 2026/27 budget.**
3. **The capital budget carry forward requests outlined in the report be approved and included as supplementary capital estimates in the 2026/27 budget.**

Reason
To be accountable for all activities and actions and to ensure that the Council conforms to all financial regulations. The report summarises the Council's finances at the end of each financial year.

16.5 TREASURY MANAGEMENT AND PRUDENTIAL INDICATORS ANNUAL REPORT FOR THE FINANCIAL YEAR ENDED 31 MARCH 2026

Cabinet noted the Treasury Management and Prudential Indicators Annual Report for the year ended 31 March 2026. The report met the requirements of both the CIPFA Code of Practice on Treasury Management and the CIPFA Prudential Code for Capital Finance in Local Authorities. The Council was required to comply with both Codes through regulations issued under the Local Government Act 2003.

16.6 GRANTS TO VOLUNTARY AND COMMUNITY ORGANISATIONS, CHARITABLE BODIES AND INDIVIDUALS INVOLVED IN SPORTS, THE ARTS AND DISABILITY MATTERS 2026/27

Cabinet considered a request for grant aid in accordance with the provisions of the Council's Grant Aid Policy.

RESOLVED that The Pythian Club be awarded £1,500.

Reason
The Council was empowered to make grants to voluntary organisations by virtue of Section 48 Local Government Act 1985 (as well as other legislation). Having an approved process in line the legislation and the Council's Grant Aid Policy will ensure the Council's compliance with its legal duties.

16.7 SEXUAL HARASSMENT POLICY

A new Sexual Harassment Policy had been introduced as a result of The Worker Protection (Amendment of the Equality Act 2010) Act. This Act placed a legal duty for employers to proactively take reasonable steps to prevent sexual harassment in the workplace. Under the new Act, organisations were required not only to respond to incidents of harassment but to take proactive measures to prevent such incidents from occurring in the first place.

RESOLVED that the new Sexual Harassment Policy be approved.

Reason
The policy has been updated in line with ACAS best practice and where relevant legal/statutory requirements.

16.8 EMPLOYEE DOMESTIC ABUSE POLICY

Members were informed that the Policy clarifies who falls within its remit and the definition of Domestic Abuse had been tightened to align with legislation. Additional employee support was outlined, such as Occupational Health and the Council's Employee Assistance Programme. Detailed recording had been tightened and home safety is now reference.

RESOLVED that the Employee Domestic Abuse Policy be approved.

Reason
There are a number of legislative requirements placed on the Council both as a local authority and employer to meet various safeguarding obligations. This policy and its implementation will assist the Council in approaching its safeguarding obligations towards its employees in relation to domestic violence.

16.9 REGULATION OF INVESTIGATORY POWERS ACT (RIPA) 2000 POLICY

Cabinet considered a report which sought approval for the Regulation of Investigatory Powers Act 2000 (RIPA) Policy and informed Members that none of the RIPA powers have been used in 2025. The RIPA Policy document should be reviewed at least once a year by Members to ensure it remains fit for purpose.

RESOLVED that the Policy for ensuring compliance with RIPA is appropriate and remains fit for purpose and notes that there has been no use of the RIPA powers in 2025.

Reason
This relates to the Council's Corporate Plan Priority for the Community Safety priority: to make Broxtowe a safe place for everyone.

17 HOUSING

17.1 HOUSING SERVICE IMPROVEMENT PLAN UPDATE

The Council continued to implement actions within the refreshed Housing and Asset Management Service Improvement Plan following the inspection from the Regulator for Social Housing in October 2025. Progress continued to be made to meet the Regulator requirements and improve service delivery. Cabinet noted the report and the key activities aligned to the revised Housing Service Improvement Plan.

17.2 ALLOCATIONS POLICY

The Allocations Policy set out who could apply for social housing; how priority was given to different applicants; and how the housing register was maintained. The draft Allocations Policy was considered by the Tenants Influence Panel, and a workshop was held with Housing employees who used the Policy prior to being submitted to the Policy Overview Working Group for consideration.

RESOLVED that the updated Allocations Policy be approved.

Reason
This ensures there is a robust structure in place for the allocation of social housing.

18 ENVIRONMENT AND CLIMATE CHANGE

18.1 BRAMCOTE QUARRY CONSULTATION

In July 2025, Broxtowe Borough Council formally adopted the former Biffa sand quarry and landfill site at Bramcote. The site now formed an important area of young woodland, grassland and biodiversity-rich habitats, located alongside an established residential community. With funding secured for improvement works, the Council had begun to implement initial enhancements, including measures to improve site accessibility, and was progressing the statutory process to designate the area as a Local Nature Reserve. Members received an update on the Bramcote Quarry consultation results and to seek agreement on the proposed name for the site.

RESOLVED that the site be named the Bramcote Quarry Nature Reserve.

Reason
This is in accordance with the Council's corporate priority to protect the environment for future generations

18.2 D.H. LAWRENCE WALKING ROUTE

The Council was proposing the development of an enhanced D.H. Lawrence walking route to strengthen connectivity between key heritage assets and green infrastructure across the Borough. The proposal builds on the existing D.H. Lawrence Walk, which currently provides a circular route centered on Eastwood and incorporates several important literary and historic locations, including the Birthplace Museum, Beauvale School and Colliers Wood.

RESOLVED that the proposed D.H. Lawrence walking route be approved, with an additional budget of £5,000 being provided for this purpose to be funded from available General Fund Revenue Contingency in 2026/27.

Reason
This is in accordance with the Council's corporate priority to protect the environment for future generations.

18.3 GLYPHOSATE UPDATE

Members received an update on pesticide usage across the Borough and to seek approval to implement a targeted trial of reduced pesticide use, including alternative management approaches, within selected parks and open spaces.

RESOLVED that:

1. **The development of a Pesticide Usage Policy be approved.**
2. **The implementation of a trial to cease pesticide use in selected parks and open spaces be approved.**

Reasons
1. Council will develop a formal Pesticide Usage Policy, setting out a clear framework for the use, reduction and management of pesticides across all service areas.

2. To inform the development of this policy and provide an evidence base for future decision-making, it is proposed to introduce a targeted trial of reduced pesticide use. The trial will apply across selected Council-managed parks and open spaces, with particular emphasis on high-use areas, including major parks and those with children's play facilities.

19 CABINET WORK PROGRAMME

Members considered the Work Programme and it was stated that the next meeting would receive a report to consider the Housing New Build Programme. Furthermore, it was stated that the Hate Crime Strategy would be submitted to a later meeting of the Cabinet.

RESOLVED that the Cabinet Work Programme, as amended, be approved.

Reason
The items included in the Work Programme will help to achieve the Council's key priorities and associated objectives.

20 EXCLUSION OF PUBLIC AND PRESS

RESOLVED that, under Section 100A of the Local Government Act, 1972, the public and press be excluded from the meeting for the following items of business on the grounds that they involve the likely disclosure of exempt information as defined in paragraphs 1, 2, and 3 of Schedule 12A of the Act.

20.1 HOUSING REPAIRS RESTRUCTURE

RESOLVED that:

1. **The proposed new structure for the Housing Repairs and Compliance service, as outlined in the report, be approved.**
2. **The proposed establishment changes include the redesignation of the Repairs and Compliance Manager to the Head of Repairs and Compliance; the creation of two Compliance Assurance Officer posts and a Compliance Co-ordinator post; the deletion of the Disrepair Inspector post and two Multi-Skilled Operatives posts; and the regrade of the Customer Services Manager and the Compliance Manager in line with the outcome of job evaluation.**
3. **The overall net increase in costs, which is partially offset by removing a temporary interim role within the Capital Works team, will be met by the Housing Revenue Account, either directly or, where appropriate, capitalised through a recharge to the Capital Programme.**

Reason
This will ensure that compliance is effectively managed and regulatory requirements are met.

21 PLANNING STAFFING RESTRUCTURE

RESOLVED that:

1. **The establishment structure changes to the Planning department, as set out, which includes the creation of a new Senior Planning Officer (Local Plan) post and a new GIS and Planning Policy Assistant post, be approved.**
2. **The establishment structure changes to Economic Development department, as set out, which include the appointment of a new permanent Economic Development Delivery Manager from April 2027, be approved.**
3. **The overall net increase in costs be met from earmarked external grant funding received, with the balance being funded from General Fund Reserves, utilising previously recognised savings from updated senior management arrangements.**

Reason
This will provide resources required for both Planning and Economic Development over the next two years.

21.1 ENVIRONMENT: ENHANCING CAPACITY TO SUPPORT PROJECT DELIVERY

RESOLVED that the establishment structure changes to the Environment department, as set out, which includes the creation of a new Grounds Maintenance Senior Team Leader, a new Tree Inspector and a new Waste and Recycling Projects Officer, be approved. The overall net increase in costs will be met from earmarked Extended Producer Responsibility (EPR) funding, with any remaining balance funded from General Fund reserves, utilising previously identified savings from the revised senior management arrangements. The cost associated with the additional Tree Inspector post will be met separately through a virement of the existing tree survey revenue budget, which is already in place. This will be transferred into the establishment budget.

Reason
This will support the delivery of key environmental projects and waste service priorities.

21.2 ADDITIONAL PRIVATE SECTOR HOUSING OFFICER

RESOLVED that an additional permanent Private Sector Housing Officer post at Grade 10 be approved, with the cost in the first year being fully met from an allocation of New Burdens Funding.

Reason
It is suggested that there should be a minimum of one Private Sector Housing Enforcement Officer per 800 private rented properties. This will provide additional officer resources are required for House in Multiple Occupation licensing, Disabled Facilities Grants, resettlement scheme inspections and empty homes.

22 WATER SUPPLY WORKS AT FACTORY LANE INDUSTRIAL ESTATE

RESOLVED that the proposed water supply works at the Factory Lane Industrial Estate be approved and that the cost of up to £23,100 be added to the Capital Programme and funded from General Fund Capital Contingencies in 2026/27.

Reason
This will create the required budgetary provision to carry out works at Factory Lane Industrial Estate in Chilwell.

23 VIADUCT ENTERPRISE PARK - BUDGET ALLOCATIONS

RESOLVED that a budget for works relating to site and equipment security at the Viaduct Enterprise Park be approved, with the budget for the combined cost of £52,000 being added to the Capital Programme 2026/27 and funded from prudential borrowing.

Reason
This will provide the capital budget for site and equipment security works at the new Viaduct Enterprise Park.

Cabinet **21 July 2026**

Report of the Monitoring Officer

Scrutiny Reviews

1. Purpose of Report

The purpose of this report is to make Members aware of matters proposed for and undergoing scrutiny. This is in accordance with all the Council's priorities.

2. Recommendation

Cabinet is asked to NOTE the report.

3. Detail

Cabinet will receive updates at each future meeting as to the progress of the Overview and Scrutiny Committee's Work Programme as contained in the attached **Appendix** and is asked to consider the future programme and decision-making with knowledge of the forthcoming scrutiny agenda. The Work Programme also enables Cabinet to suggest topics for future scrutiny.

At the Overview and Scrutiny Committee meeting held on 18 June 2026 the Committee considered the items of Lime Bikes and Missed Bins. Working Groups have commenced their reviews into the into the subjects and will continue to meet.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

The comments from the Interim Deputy Chief Executive were as follows:

There are no direct financial implications arising from this report.

7. Legal Implications

   The comments from the Monitoring Officer / Head of Legal Services were as follows:

   Whilst there are no legal implications arising from the report, under Section 9F of the Local Government Act 2000, Overview and Scrutiny Committee has the power to make reports or recommendations to Cabinet on matters which affect the Council's area or the inhabitant of its area.

8. Human Resources Implications

   Not applicable.

9. Union Comments

   Not applicable

10. Climate Change Implications

    The climate change implications are contained within the report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    Not required.

13. Background Papers

    Nil.

Appendix

1. Topics Agreed by the Overview and Scrutiny Committee

	Topic	**Topic suggested by**
1.	Lime Bikes	Councillor B C Carr
2.	Missed Bins	Assistant Director of Environment

2. Update Reviews

	Topic	**Topic suggested by**	**Proposed Date to Overview and Scrutiny Committee**
1.	Cemetery Memorials	Cabinet	18 June 2026
2.	D.H. Lawrence Museum	Overview and Scrutiny Committee	24 September 2026
3.	Equality, Diversity and Inclusion at the Council.	Councillor S Dannheimer	24 September 2026

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Cabinet **21 July 2026**

Report of the Chief Executive

Local Government Reorganisation

1. Purpose of Report

To provide Members with an update on the ongoing preparatory work being undertaken across Nottingham and Nottinghamshire in relation to Local Government Reorganisation.

2. Recommendation

Cabinet is asked to NOTE the report.

3. Detail

Members will be aware that work continues across Nottinghamshire in preparation for Local Government Reorganisation (LGR).

Recruitment to the Central Programme Management Office (PMO) team, hosted by Nottinghamshire County Council, is progressing. At the time of writing, the shortlisting process has been completed, and interviews are scheduled to take place during July for all 15 positions identified in wave one of the process. These opportunities were made available to staff across all Nottinghamshire councils, which has been reflected in the applications received.

Since the previous update, Nottinghamshire County Council's LGR Director has submitted their notice and will be leaving the organisation. In response, partners across Nottinghamshire have put additional arrangements in place to ensure continuity of leadership and programme delivery whilst recruitment is undertaken to fill the vacant position.

Alongside this activity, work is being undertaken to develop the governance arrangements that will be required following the Secretary of State's decision on the future structure of local government in Nottinghamshire. This includes the development of an appropriate programme governance framework, together with the identification of key work themes and workstreams that will support implementation. These proposals are currently being refined and will be presented to Chief Executive Officers in the near future for consideration and agreement.

At the time of writing, the Council has not received notification of the Secretary of State’s decision regarding their preferred LGR proposal for Nottinghamshire. A decision is anticipated before the Parliament Summer Recess on 17 July 2026. Should an announcement be made prior to Cabinet, a verbal update will be provided to Members at the meeting.

Officers will continue to engage with partners across Nottinghamshire and will provide further updates to Members as the programme progresses and additional information becomes available.

4. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

The Interim Deputy Chief Executive and Section 151 Officer continues to work with the Nottinghamshire Finance Officers Association (NFOA) on LGR matters, having previously supported the NFOA with the financial aspects of the options submitted in November 2025. The earlier work was completed in conjunction with the consultants, PwC, and supported by CIPFA. The assumptions made by PwC were challenged and reasonable assurances have been provided as to transition costs and potential financial savings that could be achieved by LGR.

5. Legal Implications

The comments from the Head of Legal Services and Deputy Monitoring Officer were as follows:

The approval of any proposal under the Act is an executive function in accordance with the Local Government Act 2000 Section 9D(2). The Executive will, therefore, be required to make a final decision on approving the Council's proposal for submission, taking into consideration the recommendations of the Council, which is a consultee in relation to this matter.

6. Human Resources Implications

There were no comments from the Human Resources Manager.

7. Union Comments

The Union comments were as follows:

It is probably too early at this stage to make any firm comments until the situation affecting members of staff are fully known. Regular engagement with staff to make them aware of progress and to seek their views on these important proposals is essential to maintaining good staff morale moving forward. We do accept that as the LGR progresses then the implications on staff will be clearer and then we feel that relevant feedback from Unison will thus be provided.

8. Climate Change Implications

Not applicable.

9. Data Protection Compliance Implications

   This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

10. Equality Impact Assessment

    Not applicable.

11. Background Papers

    Nil.

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Resources and Personnel Policy

Crisis Resilience Fund Policy

1. Purpose of Report

To approve the implementation of the Crisis and Resilience Fund Housing Payment Policy to replace the existing Discretionary Housing Payment policy following consideration at Policy Overview and Working Group.

2. Recommendation

Cabinet is asked to APPROVE the Crisis and Resilience Fund Housing Payment Policy and recommend the implementation to Cabinet.

3. Detail

Policy Overview and Working Group considered the Policy on 9 July 2026 making recommendations relating to the inclusion of member involvement in any reconsideration process and identifying appropriate portfolio holders to be included in the decision-making process.

The Council has historically administered discretionary financial assistance through its Discretionary Housing Payment (DHP) policy. The scheme has provided short-term support to residents facing housing-related financial difficulties, where Housing Benefit or Universal Credit Housing Costs have not fully met rental liabilities.

The DHP scheme has played an important role in:

- Preventing homelessness
- Supporting vulnerable households
- Assisting residents affected by welfare reform
- Enabling residents to sustain accommodation where there is a realistic prospect of improved financial stability.

Over recent years, the demand profile for discretionary support has evolved. Increasing financial pressures with the cost-of-living and price inflation, rising energy costs, and broader economic uncertainty have resulted in residents requiring support for a wider range of financial difficulties extending beyond traditional housing-related hardship. In response, the government created the Household Support Fund (HSF), which has been administered by Nottinghamshire County Council.

As part of an evaluation of the schemes, it was initially proposed to bring both the DHP and HSF into one manageable fund. However, during the interim period prior to Local Government Reorganisation, the government has now

provided two Crisis Resilience Funds (CRF), one to district councils and one to county councils, both replacing the previous DHP and HSF funds respectively.

The County Council's CRF framework focuses on supporting residents experiencing immediate financial hardship and aims to provide preventative support that reduces escalation into more significant social crises.

It is proposed to provide the CRF fund in an almost identical manner to the DHP policy to ensure clear and consistent approaches for residents.

Each application will continue to be assessed on its individual merits, taking account of household circumstances, income, expenditure, vulnerabilities, and the potential impact of refusing support.

The proposed Crisis and Resilience Fund Housing Payment Policy, including a breakdown of proposed changes, can be found in **Appendix 1**.

An Equalities Impact Assessment has been undertaken and is detailed in **Appendix 2**.

In addition to the CRF Policy, the Council will explore the development of a supplementary financial support scheme to assist members of the community who do not qualify for assistance through either the Council's CRF or Nottinghamshire County Council's CRF, but who are assessed as being on a low income.

4. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

The proposed Crisis and Resilience Fund Housing Payment Policy does not create a new financial assistance scheme but instead repositions and reframes the Council's existing discretionary support arrangements. As such, the Council will continue to receive funding from the government in line with previous DHP arrangements, anticipated to be in the region of £83,000 for 2026/27.

As with the previous policy, the Council will continue to monitor expenditure levels, demand trends, and award outcomes to ensure that available funding is targeted effectively and remains sustainable within existing budget allocations.

5. Legal Implications

The comments from the Head of Legal Services were as follows:

The Crisis Resilience Fund remains a discretionary scheme administered by the Council within the relevant legislative and policy framework governing welfare assistance and local authority discretionary support. The Council can support

this type of local welfare provision under the “Local authority’s general power of competence”, as set out in S.1 of the Localism Act 2011

The policy has been designed to ensure consistency, fairness, and transparency in decision-making which is consistent with relevant public law principles.

6. Human Resources Implications

Not applicable.

7. Union Comments

Not applicable.

8. Climate Change Implications

Not applicable.

9. Data Protection Compliance Implications

This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

10. Equality Impact Assessment

As this is a change to policy / a new policy an equality impact assessment is included in the appendix to this report.

11. Background Papers

Nil.

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CRISIS AND RESILIENCE FUND HOUSING PAYMENT POLICY

Document title	Crisis and Resilience Fund Housing Payment Policy
Document version	1
Department	Deputy Chief Executive
Title of Author	Assistant Director Revenues, Benefits and Customer Services
Date document approved	
Review cycle	Every 2 years
Date of next review	April 2028

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1.0 Scope

The Crisis and Resilience Fund (CRF) has been made available to the Council to support low-income households who encounter financial hardship and to support activities that build individual and community financial resilience. This includes specified funding for housing support, called the Housing Payment element and replaces the Discretionary Housing Payment (DHP).

Each year, the Department for Work and Pensions (DWP) allocate funding to County Councils for the Crisis and Resilience Fund (CRF) scheme, which consists of four strands and the County Council then distributes funding to Local Authorities who are responsible for the CRF Housing payment strand to enable awards to be paid.

The Housing payment will closely replicate existing DHP guidelines and will adopt a phased transition over the 3-year funding period. Broxtowe Borough Council's policy will therefore remain the same and has been rebranded to reflect the new arrangements.

Following the abolition of Council Tax Benefit from April 2013, Discretionary Housing Payments (DHPs) could no longer be made towards Council Tax Liability. A customer who is receiving Council Tax Support, with no rental liability (e.g. an owner occupier) is not eligible to apply for a Housing Payment.

A separate 'Council Tax – Section 13a (1) (c) Council Tax Reductions Discretionary Discount Scheme' exists, and applications can be considered for this scheme.

Every claimant who is entitled to the minimum amount of Housing Benefit or Universal Credit Housing Element and who has a shortfall is eligible to make a claim for help. There is no entitlement to a Housing Payment. Each application will be considered on its individual merits. The purpose of the scheme is to provide additional financial support to benefit recipients who are suffering from financial hardship and are unable to meet their housing costs.

Housing costs are not defined in the regulations, and this gives Broxtowe Borough Council a broad discretion to interpret the term as it wishes. In general, housing costs mean rental liability.

2.0 Purpose

The purpose of this policy is to specify how Broxtowe Borough Council's Revenues, Benefits and Customer Services department will operate the scheme and to indicate some factors that will be considered when deciding if a Housing Payment award can be made.

Each case will be treated on its individual merits, and all customers will be treated equally and fairly when the scheme is administered.

The Revenues, Benefits and Customer Services department is committed to working with the local voluntary sector, social landlords and other interested parties within the

district to maximise entitlement to all available state benefits and this will be reflected in the administration of the scheme.

3.0 Aims and Objectives

The Revenues, Benefits and Customer Services department will consider making a payment of a Housing Payment to claimants who meet the qualifying criteria. Before making an award, the authority must be satisfied that the customer is entitled to:

- Housing Benefit, or
- Universal Credit Housing Element, and
- has a rental liability; and
- requires further financial assistance with housing costs.

This policy is not intended to define the specific situations of when we will or will not make a discretionary payment; to do so would make the policy too rigid and may prevent payments from being made where there are exceptional or unusual circumstances. Payments are expected to be made to meet current needs rather than past debts.

The Revenues, Benefits and Customer Services department will oversee the operation of this policy to:

- Alleviate poverty.
- Encourage and sustain the Authorities residents in employment.
- Help those who are trying to help themselves.
- Keep families together.
- Prevent child poverty.
- Support the vulnerable in the local community.
- Help customers through a personal crisis / difficult event.
- Support households that are returning to work after a period of unemployment and aid in managing their finances during the transition from coming off benefits, receiving wages and securing UC entitlement.
- Support those who are in affordable housing but at risk of becoming homeless due to being unable to meet their full rent liability due to severe financial difficulties from the effects of the current economic climate.
- To support foster carers who have a spare room for a potential foster child
- To consider disabled people living in accommodation that has been substantially adapted for their needs.

The main objectives of Broxtowe Borough Council's Housing Payment Scheme reflect the objectives outlined in the Department for Work and Pensions (DWP) guidance for Local Authorities. The main objectives are aimed at:

- Preventing homelessness
- Keeping families together
- Supporting the vulnerable and elderly in sustaining tenancies
- Enabling people to secure new sustainable tenancies
- Providing financial respite for people in short-term difficulty
- Incentivising people into and maintaining work
- Supporting people in education

3.1 The main features of the scheme are:

- The scheme is purely discretionary; a claimant does not have a statutory right to a payment.
- The amount that can be paid out by an Authority in any financial year is cash-limited by the Secretary of State.
- The administration of the scheme is for the Revenues, Benefits and Customer Services department to determine.
- Housing Payments are not a payment of Housing Benefit or Universal Credit Element. However, the minimum amount of Housing Benefit or Universal Credit must be paid in the benefit week that a Housing Payment is awarded for.

3.2 Housing Payments can be provided for:

- Rent officer restrictions such as Local Reference Rents (LRR), Single Room Rent (SRR) size criteria or when the Local Housing Allowance (LHA) does not meet the rent.
- Reductions in Housing Benefit or Universal Credit Housing Element entitlement following changes to the LHA rates.
- Non-dependant deductions.
- Income tapers.
- Prevention of loss of tenancy due to hardship - consideration can be given to backdating of the award if the customer has demonstrated good cause. This will require evidence to be provided by the tenant, where necessary
- Help to secure a new sustainable tenancy

3.3 Securing new sustainable tenancies:

This category intends to provide awards (normally one-off) to enable people to secure new sustainable tenancies either in or out of the Broxtowe area. Awards would only be considered where, at present, the Housing Benefit / Universal Credit Housing Element payable does not cover the individual's liability for reasons such as under-occupancy.

The awards within this category are made up as follows:

- **Removal costs**:
  The reasonable costs of moving to a more suitable-sized accommodation can be met by a Housing Payment. Removal costs would be paid to the customer following proof of removal costs by way of receipt or invoice.
- **Deposits**:
  Deposits are paid in order to help individuals secure new sustainable tenancies. This would be a maximum of one month's rent and would only be payable if this payment enabled the tenant to move to sustainable accommodation (correct number of bedrooms for household composition).
- **Rent in advance**:
  Some tenancies require one month's rent in advance (sometimes 4 weeks rent) on top of a deposit. A maximum of one month's rent in advance could be paid by Housing Payment in order to help an individual secure a new sustainable tenancy in a smaller property (correct number of bedrooms for household composition).

Rent deposits and rent upfront will be paid as a lump sum directly to the new Landlord / Agent.

In exceptional circumstances, payment of Housing payments for rent deposits and rent in advance can be made even where it has not been possible for the tenant to move into the most affordable accommodation, for example, when someone is fleeing their home due to domestic violence and needs to seek a place of safety, such as a refuge.

3.4 Support on 2 homes:

The regulations permit a person to receive help through an award for the rent due on a property they have moved into when treated as temporarily absent from their home, where the claimant has moved due to domestic violence. If the customer is liable for the rent on both properties and in both cases, there is a shortfall, an award could be awarded in respect of both properties, subject to the weekly limit on each property.

- If the claimant is liable for payments on one dwelling but is having to pay rent on 2, a weekly award could be made to assist with the temporary accommodation up to the level of the weekly eligible rent on the dwelling from which they are temporarily absent.

- Rent shortfalls to prevent a household from becoming homeless whilst the Housing Section explores alternative options.
- Foster carers, including those between placements.
- Disabled people subject to under-occupancy living in accommodation that has been substantially adapted for their needs.

In addition to the above, Housing Payments can be used to provide support to customers affected by some of the key welfare reforms, including:

- Reductions in Housing Benefit or Universal Credit Housing Element where the benefit cap has been applied.
- Reductions in Housing Benefit or Universal Credit Housing Element for under-occupation in the social rented sector.
- Reductions in Housing Benefit or Universal Credit Housing Element because of LHA restrictions to the shared room rate for those customers who have not reached 35 years.

Housing Payments cannot be used for help with:

- Ineligible service charges.
- Increases in rent due to outstanding rent arrears
- Shortfalls in Council Tax Support.
- Rent, when the person is getting Council Tax support but not HB or help with housing costs in UC.
- Certain sanctions and reductions in benefits.
- Benefit suspensions

Shortfalls caused by overpayment recovery.

4.0 Regulatory Code and Legal Framework

This policy should be read in conjunction with the following:

- The legislation governing CRFHP is delivered under national Crisis & Resilience Fund guidance (2026–2029).
- Section 31 of the Local Government Act 2003
- National CRF guidance
- Housing Act 1996
- Homelessness Reduction Act 2017
- Equality Act 2010
- Welfare Reform Act 2012
- Housing Benefit Regulations 2006
- Universal Credit Regulations 2013
- Data Protection Act 2018 / UK GDPR
- Human Rights Act 1998

5.0 Policy Outline

5.1 Claiming a Housing Payment

In most cases, the resident who claims a Housing payment will be the person entitled to Housing Benefit or Universal Credit Housing Element. The Council may also accept claims from appointees or another person acting on the resident's behalf, such as a relative or social worker. The applicant should countersign the claim whenever this is reasonably possible.

Claims must be submitted to Broxtowe Borough Council using an application form. This form can be accessed via the Broxtowe Borough Council website or requested from the Customer Services section, who can arrange for a paper copy to be posted.

The Revenues, Benefits and Customer Services department may request any reasonable evidence in support of an application for a Housing payment. The claimant will be asked to provide the evidence within one month of such a request, although this will be extended in appropriate circumstances. Sufficient evidence will need to be obtained to enable the decision-maker to compare income against expenses to identify where there is a shortfall.

The department also reserves the right to verify any information or evidence provided by the claimant, where appropriate. If the claimant does not provide the required evidence within the specified timescale, the application will be withdrawn.

5.2 Awarding a Housing Payment

All applications will initially be assessed by an officer within the Revenues, Benefits and Customer Services department, typically based on the household's income and expenditure.

Essentially, the Council will compare the household income and expenditure to see whether the customer needs further financial assistance to meet their housing costs. Each decision reached is "discretionary" and is not governed by strict regulations, although the Council will ensure that all decisions made are impartial and reasonable.

Please note that the regulations regarding the treatment of income in Housing Benefit and Universal Credit claims do not apply in the decision-making process. Therefore, we may decide to count income into a calculation that might have been disregarded in the Housing Benefit or Universal Credit assessment e.g., Child Benefit, Maintenance payments and Disability Allowance received by any member of the household (as any additional expenditure associated with their disability will have been considered in their outgoings).

Similarly, we can use our discretion when determining if the expenses are reasonable. Any decisions made about a person's expenditure will be made on an individual basis and may require some additional clarification.

In deciding whether to award a Housing payment, the Revenues, Benefits and Customer Services department will consider:

- The shortfall between Housing Benefit or Universal Credit Housing Element and the rental liability.
- Any steps taken by the claimant to reduce their rental liability.
- The medical circumstances of the claimant, their partner and any dependents and any other occupants of the same household. Disability related benefits are intended to be used to help pay for the extra costs of disability, and as such, money might already be committed to other liability such a Mobility schemes, provision of care, etc.
- The income and expenditure of the claimant, their partner and any dependents or other occupants of the claimant's home.
- Any savings or capital that might be held by the claimant or their family.
- The level of indebtedness of the claimant and their family's circumstances.
- The amount available in the budget at the time of the application.
- The possible impact on the Council of not making such an award, e.g. pressure on priority homeless accommodation.
- Any other special circumstances brought to the attention of the Revenues, Benefits and Customer Services department.

5.3 Period of Award

The Crisis and Resilience Fund Housing Payment scheme should be seen as a short-term fund to assist with financial hardship. It is not and should not be considered as a way around any current or future entitlement reductions set out within legislation.

In all cases, the Revenues, Benefits and Customer Services department will decide the length of time for which a Housing payment will be awarded on the basis of the evidence supplied and the facts known. The Council reserves the right to suspend or cease awards where the available budget has been exhausted.

5.4 Start date of an Award

The start date of an award will normally be:

i. The Monday after the written claim form for a Housing payment is received or the initial request made to the Benefits Department; or

ii. The date on which entitlement to Housing Benefit or Universal Credit Housing Element commenced (providing the application form is received within one calendar month of the claim for Housing Benefit or Universal Credit Housing Element being decided), whichever is the most appropriate.

The Revenues, Benefits and Customer Services department cannot award a Housing payment for any period outside an existing Housing Benefit or Universal

Credit Housing Element period granted under the Housing Benefit or Universal Credit statutory schemes.

- The minimum period for which the Revenues, Benefits and Customer Services department will allow an award is one week.
- The Revenues, Benefits and Customer Services department will consider any reasonable request for backdating an award of a Housing payment, but such consideration will usually be limited to the current financial year.

5.5 Backdating an Award

The Revenues, Benefits and Customer Services department will look at each claim on its own merits when deciding whether or not to backdate a claim, but such consideration will usually be limited to the current financial year. Unlike Housing Benefit or Universal Credit Housing Element, there are no rules on backdating, but the Revenues, Benefits and Customer Services department will act consistently when considering requests for backdating.

5.6 Capital

Where the customer holds capital, the officer must use their discretion to decide whether the level of capital warrants refusing the customer's application. However, consideration should be given to the fact that the capital may be reserved for a reasonable future expense, such as a bond or rent in advance in respect of cheaper accommodation.

5.7 Turning down affordable accommodation

Under normal circumstances, where a customer has previously refused the allocation of more suitable, affordable accommodation, an award will not be paid.

5.8 Expenditure

When considering expenditure, the Revenues, Benefits and Customer Services department will consider ‘expenditure of luxury items’. These Items should be considered on an individual case basis; the customer may not be able to dispose of a luxury item quickly, or they may have a good reason for requiring the item. However, where an item is clearly unnecessary, we should not include it as part of the customer’s expenditure.

When awarding a Housing payment to assist the customer with securing a new tenancy, the authority will consider the following:

- The authority will include information about the legal obligations for landlords to protect any deposit paid in a government-approved tenancy deposit protection scheme. Compliance with this requirement will help reduce the need for future help with deposits.

- Establish if the customer is due to have a deposit in respect of their existing tenancy returned to them.
- Making payment to the landlord rather than the customer, where applicable.

The Revenues, Benefits and Customer Services department will decide how much to award based on all of the customer's circumstances. This may be an amount below the difference between the rent liability and the Housing Benefit or Universal Credit Housing Element payment. An award of a Housing payment does not guarantee that a further award will be made at a later date, even if the claimant's circumstances have not changed.

Careful consideration may be required to determine how best to target the funding to priority groups, whilst ensuring that each case will be considered on its individual merits.

- Families with children at a critical point in their education.
- Young people leaving local authority care.
- Foster carers, including those between placements: foster children are not included in the Housing Benefit assessment, but neither is the income from foster allowances, as the Government values the work done by foster carers. Whilst some carers may be able to make up the shortfall using some of their allowance, or by other means, some thought should be given to supporting foster carers who are deemed to be under-occupying their accommodation because they have rooms occupied by foster children, or being kept available for future placements.
  The Council should bear in mind that foster carers should not be financially penalised because of their foster care role.
- People going through the approval process to become foster carers may need to show that they have a spare room to be approved.
  If a Housing payment was awarded on this basis, it would be up to the claimant to inform the Revenues, Benefits and Customer Services department of a change of circumstances if, for example, they were not subsequently approved.
- Families with kinship care arrangements.
  Children who go into the care of family and friends are often extremely vulnerable and will usually benefit from the stability of remaining in a familiar area and continuing to attend their local school.
- Families with a child temporarily in care, but who is expected to return home.
- What constitutes temporary will be at the authority's discretion.
- Families with a social services intervention, for example, highly dependent adults, children at risk or involvement in a family intervention project.
- People who have had to flee domestic violence or have moved because of the threat of violence in another area.

- Where someone in the household is expecting a baby (including those currently in shared accommodation or subject to an under-occupation reduction).
- Ex-homeless people are being supported to settle in the community.
- People with health or medical problems who need access to local medical services or support that might not be available elsewhere.
- People with disabilities who need, or have had, significant adaptations made to their property, or who are living in a property particularly suited to their needs.
- Where the claimant or someone in the household has a disability which requires them to have a larger property than would usually be the case for the size of their household, due to, for example, a medical condition or where a child has a particular disability that might mean they are unable to share a bedroom.
- People with disabilities who receive informal care and support in their current neighbourhood from family and friends, which would not be available in a new area.
  In this respect, the authority may also consider families who have a child with a disability who relies heavily on local support networks.
- Households with disabled children who require an overnight carer.
- The elderly who have lived in the area for a long period of time and would find it difficult to establish support networks in a new area.
- People who need to live near their jobs because they work unsociable hours or split shifts, or where moving home may mean living in an area where public transport would be inadequate to enable them to sustain their current job.

5.9 Changes in circumstances

If there is a change in circumstances during the period of an award, the award may be revised or terminated. In such cases, a new application may be required to reflect the updated circumstances, and a fresh decision will be made accordingly.

5.10 Method of payment

The Revenues, Benefits and Customer Services department will decide the most appropriate person to pay based on the circumstances of each case. This could include paying:

- The claimant
- Their partner
- An appointee.
- Their landlord (or an agent of the landlord)

- Any third party to whom it might be most appropriate to make payment.

The Revenues, Benefits and Customer Services department will pay an award by the most appropriate means available in each case.

- By electronic transfer (e.g. BACS)
- By crediting the claimant's rent account if renting from the Council.

Payment frequency will normally be made in line with how the customer's Housing Benefit or Universal Credit Housing Element is paid to them.

Weekly payments would only apply where Universal Credit Housing Element payments are paid directly to a Council Tenant's rent account.

5.11 Notification

The Revenues, Benefits and Customer Services department will inform the claimant of the outcome of their application within 14 days of receipt of all of the information required being received.

Where the application is unsuccessful, the Revenues, Benefits and Customer Services department will set out the reasons why this decision was made and explain the right of review. Where the application is successful, the Revenues, Benefits and Customer Services department will advise:

- The weekly amount of Housing Payment awarded.
- The period of the award.
- How, when, and to whom the award will be paid.
- The requirement to report a change in circumstances.

Where customers are identified as experiencing difficulty in managing their financial affairs, they will be signposted to Citizens Advice for independent support and guidance.

Where customers are experiencing a shortfall in their housing costs as a result of welfare reform measures or restrictions associated with their accommodation, they will be advised to contact the Council's Housing Section for further assistance and advice.

5.12 Refused Housing Payment

Where a request for a Housing Payment has been refused, repeat applications will not normally be considered unless the customer can demonstrate a significant change in their circumstances or that a reasonable period of time has elapsed since the previous decision.

5.13 The right to seek a review

Housing payments are not payments of Housing Benefit or Universal Credit Housing Element and therefore are not subject to the statutory appeals mechanism.

The Revenues, Benefits and Customer Services department will operate the following process for dealing with a decision about a refusal to award a Housing payment, a decision to award a reduced amount of Housing payment, a decision not to backdate a Housing payment or a decision that there has been an overpayment of a Housing payment.

- A claimant (or their appointee) who disagrees with a decision may dispute the decision. A request must be made in writing to the Revenues, Benefits and Customer Services department within one calendar month of the written decision about the Housing payment being issued to the claimant.
- A Senior Officer will then review the decision and all the evidence held and revise the decision if appropriate. If the decision is not revised, then they will make a recommendation to the Assistant Director Revenues, Benefits and Customer Services and provide all appropriate information surrounding the recommendation.
- The case will be reviewed by the Assistant Director for Revenues, Benefits and Customer Services, in consultation with the Portfolio Holder for Resources and Personnel. Where the Portfolio Holder for Resources and Personnel is unavailable or has a conflict of interest, the Portfolio Holder for Housing will act as the appropriate Deputy. Where a recommendation to refuse a Housing Payment is upheld, the Senior Officer will notify the claimant in writing, clearly outlining the reasons for the decision
- This decision is final and binding and may only be challenged via the judicial review process or by complaint to the Local Government Ombudsman if there is an allegation of maladministration.
- In exceptional circumstances, the above time period may be extended.
- Complaints about the administration of the scheme can be made through the Council's corporate complaints procedure.

5.14 Overpaid Housing Payments

Housing payments may be recovered either fraudulently or otherwise. An award is also recoverable if it was paid as a result of an error made when the claim was determined.

The Revenues, Benefits and Customer Services department cannot recover Housing payments from ongoing Housing Benefit or Universal Credit Housing Element entitlement. Therefore, the only method of recovery if a Housing payment is overpaid is to request repayment of the debt from the customer by invoice.

5.15 Fraud

The Revenues, Benefits and Customer Services department is committed to the fight against fraud in all its forms.

A claimant who tried to fraudulently claim a Housing Payment by falsely declaring their circumstances, providing a false statement or evidence in support of their application, may have committed an offence under the Theft Act 1968.

Where the Revenues, Benefits and Customer Services department suspects that such a fraud may have occurred, the matter will be investigated as appropriate, and this may lead to criminal proceedings being instigated.

The Council also reserves the right to use any details submitted by person (s) to check against national records and databases to highlight any potentially fraudulent activity.

6.0 Related Policies, Procedures and Guidelines

The Crisis and Resilience Fund is a consolidated revenue grant that will be delivered through the Local Government Finance Settlement from the financial year ending March 2027. The Ministry of Housing, Communities and Local Government is providing funding to Authorities under Section 31 of the Local Government Act 2003, to administer The Fund. Authorities have discretion on exactly how this funding is used within the scope set out in this guidance and the Grant Determination Letter.

The Policy has been developed in conjunction with the related government guidance.

7.0 Review

The policy should be reviewed every two years.

8.0 Appendices

8.1 Policy Change Table

Policy Section	Suggested Change	Reason for Change
1.0	Amend terminology to reflect the replacement of Discretionary Housing Payments with the Crisis and Resilience Fund	The Discretionary Housing Payment scheme has ended and been replaced by the Crisis and Resilience Fund
5.13	Outlines the officers responsible for both initial decision-making and the review of decisions relating to Crisis and Resilience Fund Housing Payments, including the Portfolio Holder for Resources and Personnel. Where the Portfolio Holder for Resources and Personnel is unavailable or has a conflict of interest, the Portfolio Holder for Housing will act as the appropriate Deputy.	To ensure an appropriate level of delegated authority within the Council's Scheme of Delegation, while enabling timely decision-making in response to the urgent nature of such applications
7.0	Reviewing the Policy every two years	Ensure that the policy is reviewed in a timely manner.

Equality Impact Assessment

The Equality Act 2010 replaces the previous anti-discrimination laws with a single Act. It simplifies the law, removing inconsistencies and making it easier for people to understand and comply with it. It also strengthens the law in important ways, to help tackle discrimination and equality. The majority of the Act came into force on 1 October 2010.

Public bodies are required in it to have due regard to the need to:

- eliminate unlawful discrimination, harassment, victimisation and any other conduct prohibited under the Act
- advance equality of opportunity between people who share a protected characteristic and people who do not share it, and
- foster good relations between people who share a protected characteristic and people who do not share it.

The public sector Equality Duty came into force on 5 April 2011. The duty ensures that all public bodies play their part in making society fairer by tackling discrimination and providing equality of opportunity for all. It ensures that public bodies consider the needs of all individuals in their day to day work – in shaping policy, delivering services and in relation to their own employees.

The Equality Duty encourages public bodies to understand how different people will be affected by their activities so that policies and services are appropriate and accessible to all and meet different people's needs. By understanding the effect of their activities on different people, and how inclusive public services can support and open up people's opportunities, public bodies are better placed to deliver policies and services that are efficient and effective.

The new equality duty replaces the three previous public sector equality duties, for race, disability and gender. The new equality duty covers the following protected characteristics:

- age
- disability
- gender reassignment
- pregnancy and maternity
- race – this includes ethnic or national origins, colour or nationality
- religion or belief – including lack of belief
- sex
- sexual orientation.

It also applies to marriage and civil partnership, but only in respect of the requirement to have due regard to the need to eliminate discrimination.

The Council has also decided to treat people who have care experience as if they had a protected characteristic under the law.

Having due regard means consciously thinking about the three aims of the equality duty as part of the process of decision-making. This means that consideration of

equality issues must influence the decisions reached by public bodies, including how they act as employers, how they develop, evaluate and review policies, how they design, deliver and evaluate services, and how they commission and procure from others.

Having due regard to the need to advance equality of opportunity involves considering the need to:

- remove or minimise disadvantages suffered by people due to their protected characteristics
- meet the needs of people with protected characteristics, and
- encourage people with protected characteristics to participate in public life or in other activities where their participation is low.

Fostering good relations involves tackling prejudice and promoting understanding between people who share a protected characteristic and others.

Complying with the equality duty may involve treating some people better than others, as far as this is allowed by discrimination law. For example, it may involve making use of an exception or the positive action provisions in order to provide a service in a way which is appropriate for people who share a protected characteristic.

The Equality Duty also explicitly recognises that disabled people's needs may be different from those of non-disabled people. Public bodies should therefore take account of disabled people's impairments when making decisions about policies or services. This might mean making reasonable adjustments or treating disabled people better than non-disabled people in order to meet their needs.

There is no explicit requirement to refer to the Equality Duty in recording the process of consideration but it is good practice to do so. Keeping a record of how decisions were reached will help public bodies demonstrate that they considered the aims of the Equality Duty. Keeping a record of how decisions were reached will help public bodies show how they considered the Equality Duty. Producing an Equality Impact Assessment after a decision has been reached will not achieve compliance with the Equality Duty.

It is recommended that assessments are carried out in respect of new or revised policies and that a copy of the assessment is included as an appendix to the report provided to the decision makers at the relevant Cabinet, Committee or Scrutiny meeting.

Where it is clear from initial consideration that a policy will not have any effect on equality for any of the protected characteristics, no further analysis or action is necessary.

Public bodies should take a proportionate approach when complying with the Equality Duty. In practice, this means giving greater consideration to the Equality Duty where a policy or function has the potential to have a discriminatory effect or impact on equality of opportunity, and less consideration where the potential effect on equality is

slight. The Equality Duty requires public bodies to think about people's different needs and how these can be met.

EQUALITY IMPACT ASSESSMENT (EIA)

Directorate:	Deputy Chief Executive	Title of the Lead Officer responsible for EIA	Assistant Director Revenues, Benefits and Customer Services
Name of the policy or function to be assessed:		Crisis and Resilience Fund Housing Payment Scheme	
Title of the Officer undertaking the assessment:		Assistant Director Revenues, Benefits and Customer Services	
Is this a new or an existing policy or function?		Existing Policy	

1. What are the aims and objectives of the policy or function?

The aim of the Crisis and Resilience Fund Housing Payment Scheme is to provide short-term financial assistance to residents experiencing financial hardship, with a particular focus on preventing homelessness and supporting individuals and families to sustain their housing.

The scheme seeks to:

- Provide emergency and discretionary financial support for housing-related costs, including rent arrears, deposits, and other essential housing expenses
- Support vulnerable households facing crisis situations, helping to stabilise their circumstances
- Reduce the risk of homelessness and reliance on statutory homelessness services
- Ensure that support is administered in a fair, consistent, and transparent manner
- Target limited resources to those most in need while ensuring appropriate stewardship of public funds

The scheme operates as part of the Council's wider commitment to supporting residents through financial hardship and promoting long-term resilience.

2. What outcomes do you want to achieve from the policy or function?

The key outcomes are:

Directorate:	Deputy Chief Executive	Title of the Lead Officer responsible for EIA	Assistant Director Revenues, Benefits and Customer Services

- Prevention of homelessness and housing instability
- Improved financial resilience among vulnerable households
- Timely access to emergency financial assistance
- Reduced demand on crisis and statutory services
- Fair and consistent decision-making aligned with need

The Council aims to ensure that residents facing hardship are supported effectively, enabling them to maintain safe and stable housing.

3. Who is intended to benefit from the policy or function?

The scheme is intended to benefit:

- Low-income households within the Borough
- Individuals and families experiencing financial crisis
- Residents at risk of homelessness or housing instability
- Vulnerable groups, including those with disabilities, long-term health conditions, or caring responsibilities

4. Who are the main stakeholders in relation to the policy or function?

- Residents applying for support
- Housing Benefit recipients
- Private and social landlords
- Homelessness and housing services
- Advice agencies and support organisations
- Council services involved in financial inclusion and welfare support

5. What baseline quantitative data do you have about the policy or function relating to the different equality strands?

At present, baseline data is limited as this is a new scheme. However, demand for financial assistance is highest among low-income and vulnerable groups. Monitoring arrangements will be put in place to collect data on applications and awards across equality strands.

Directorate:	Deputy Chief Executive	Title of the Lead Officer responsible for EIA	Assistant Director Revenues, Benefits and Customer Services

6. What baseline qualitative data do you have about the policy or function relating to the different equality strands?

Qualitative evidence from existing services indicates that:

- Financial hardship disproportionately affects vulnerable groups, including disabled people, single parents, and minority ethnic communities
- Barriers to accessing support may include digital exclusion, language barriers, and lack of awareness
- Crisis situations often arise suddenly, requiring flexible and responsive support

7. What has stakeholder consultation, if carried out, revealed about the nature of the impact?

No formal external consultation has been conducted. However, insight from internal services and partner organisations indicates that:

- There is a clear need for accessible emergency financial support
- Early intervention can prevent escalation into homelessness
- Flexible discretionary schemes are effective in supporting vulnerable households

8. From the evidence available does the policy or function affect or have the potential to affect different equality groups in different ways? In assessing whether the policy or function adversely affects any particular group or presents an opportunity for promoting equality, consider the questions below in relation to each equality group:

Does the policy or function target or exclude a specific equality group or community? Does it affect some equality groups or communities differently? If yes, can this be justified?

The scheme does not intentionally exclude any protected group, but is targeted at those in financial hardship, who are more likely to include individuals with protected characteristics

Some groups may face greater barriers to access, including disabled people, older residents and people with language or literacy barriers. The scheme is designed to be accessible and responsive, mitigating these risks

- **Is the policy or function likely to be equally accessed by all equality groups or communities? If no, can this be justified?**

Yes. Application processes will be designed to be inclusive. The scheme has the potential to reduce inequalities by supporting those most in need, improve housing stability for vulnerable groups and promote social inclusion and wellbeing

- **Are there barriers that might make access difficult or stop different equality groups or communities from accessing the policy or function?**

Alternative methods of application/support will be available where needed.

- **Could the policy or function promote or contribute to equality and good relations between different groups? If so, how?**

The scheme promotes equality by targeting financial assistance towards those in greatest need, including vulnerable groups who are more likely to experience hardship. It supports housing stability and reduces the risk of homelessness, helping to improve wellbeing and social inclusion across diverse communities. By ensuring fair, accessible, and responsive support, it also builds trust in services and fosters positive relations between different groups.

- **What further evidence is needed to understand the impact on equality?**

Monitoring data will be collected to assess take-up across equality groups, and feedback from applicants and stakeholders will inform future improvements

9. On the basis of the analysis above what actions, if any, will you need to take in respect of each of the equality strands?

Age: Ensure accessibility for older residents, including non-digital access routes

Disability: Provide reasonable adjustments, including assisted applications and accessible formats

Gender: Not Applicable

Gender Reassignment: Not Applicable
Marriage and Civil Partnership: Not Applicable
Pregnancy and Maternity: Recognise increased financial vulnerability; prioritisation may be appropriate in crisis situations.
Race: Ensure information is accessible; consider translation or support where required
Religion and Belief: Not Applicable
Sexual Orientation: Not Applicable
Care Experience: Care-experienced individuals may be particularly vulnerable; ensure awareness and access to support.

I am satisfied with the results of this EIA. I undertake to review and monitor progress against the actions proposed in response to this impact assessment.

Signature: 

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Resources and Personnel Policy

Citizens Advice Nottinghamshire Central and South

1. Purpose of Report

To provide Cabinet with an update on activity at the Broxtowe Division of Citizens Advice Nottinghamshire Central and South and approve the release of the third year of grant aid funding as approved by Cabinet in July 2024.

2. Recommendation

Cabinet is asked to note the report from Citizens Advice Nottinghamshire Central and South and RESOLVE to release the third year grant aid funding of £73,750 for 2026/27 accordingly.

3. Detail

In July 2024, Cabinet approved grant aid of £73,750 to the Broxtowe Division of Citizens Advice Nottinghamshire Central and South ("CANCAS Broxtowe", previously known as Citizens Advice Central Nottinghamshire), which included £10,000 towards the annual rental of accommodation in the Council Offices. The resolution included a commitment to award grant aid at this level in both 2025/26 and 2026/27, subject to a suitable Service Level Agreement and monitoring being in place. This three-year funding settlement was seen to provide some much-needed stability for CANCAS Broxtowe and give it a platform to lever in additional funds from other sources.

Under the terms of the funding settlement and the Service Level Agreement, CANCAS Broxtowe has submitted its update report for 2025/26. This is presented in the **Appendix** for consideration.

The overall budget for grants to voluntary organisations in 2026/27 is £168,800. An amount of £73,750 has been earmarked from the overall grant aid budget towards CANCAS Broxtowe.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

   The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

   The overall budget for grants to voluntary organisations in 2026/27 includes an amount of £73,750 which has been earmarked for CANCAS Broxtowe. This includes £10,000 towards the rental obligation for the office accommodation at the Council Offices in Beeston.

7. Legal Implications

   The comments from the Monitoring Officer / Head of Legal Services were as follows:

   The Council is empowered to make grants to voluntary organisations by virtue of Section 48 Local Government Act 1985 (as well as other legislation). Having an approved process in line the legislation and the Council's Grant Aid Policy will ensure the Council's compliance with its legal duties.

8. Human Resources Implications

   Not applicable.

9. Union Comments

   Not applicable.

10. Climate Change Implications

    No climate change implications have been identified in relation to this report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    As this is not a change to policy an equality impact assessment is not required.

13. Background Papers

    Nil.

Appendix

Citizens Advice Nottinghamshire Central and South, Broxtowe Division

Citizens Advice Nottinghamshire Central and South ("CANCAS Broxtowe", previously known as Citizens Advice Central Nottinghamshire), has provided the following information in accordance with the terms of the grant awarded by Cabinet in July 2024 and the Service Level Agreement for 2024/2027. Members will recall that CANCAS Broxtowe was formed in 2024 from three previously existing Citizens Advice Local Offices, one of which was the former Citizens Advice Broxtowe. All figures in this report relate to Broxtowe only, with the funding provided by this Council being ring-fenced for the benefit of Broxtowe residents.

1. Summary

In the last 12 months (April 2025 to March 2026), CANCAS Broxtowe has helped 7,509 clients on a wide range of enquiries. CANCAS Broxtowe has provided a summary analysis of the 19,056 enquiries that were handled during the financial year of 2025/26. Most of these contacts related to benefits and housing matters (66%), with the remaining enquiries being classified as debt, utilities, employment, signposting, legal, relationships, financial, consumer, health, tax. CANCAS Broxtowe has also assisted clients in accessing £4.99m of additional benefits, which makes a huge difference to their wellbeing as well as supporting the local economy.

Housing enquiries have now overtaken debt as CANCAS Broxtowe's second largest enquiry area, with changes to legislation and landlords selling properties leading to an increase as well as other factors such as negative budgets making private rented property unaffordable (see campaign areas). Utilities enquiries has now overtaken relationship enquiries and is now CANCAS Broxtowe's fifth largest enquiry area. Debts worth £480k have been written off for Broxtowe households.

Over the last three years, CANCAS Broxtowe has worked hard to create new partnerships. The UKSPF project for financial resilience work has resulted in a new partnership with 'Futures' coming into the offices to aid residents to get economically active once CANCAS Broxtowe has removed the barriers to work. This is coming to an end, so further funds are being sought through channels such as East Midlands Combined County Authority.

The Mediation service is being gradually closed down for other housing priority areas and loss of funding.

2. Staffing

CANCAS Broxtowe currently employs 29 paid staff in Broxtowe (across the whole Central Nottinghamshire area its 57). In the first half of this year CANCAS Broxtowe recruited 10 new volunteers to its establishment and is currently grateful to the support of 56 volunteers including eight Trustees.

3. Volunteers

The volunteers give their time freely and all work from offices in Eastwood and Beeston carrying out a mixture of face to face, telephone and email enquiries. In addition, around 60% of volunteers move onto paid work, partly as a result of the skills and confidence gained as a volunteer. Many volunteers take up paid roles within the organisation where appropriate as it is difficult to recruit staff already trained in the advice field.

Schedule A – Output Measures 2025/2026

	Outcome Measure	**Total**
6.1	Number of new issues (problems) dealt with	19,056
6.2	Number of clients receiving support	7,509
6.3	Average amount of debt handled per client seeking debt advice	£13,317
6.4	Estimated amount of benefits gained for clients seeking advice	£4,991,928
6.5	Please list the top five advice needs and the number of new social policy issues recorded for each: ● Benefits ● Housing ● Debt ● Employment ● Utilities	 9,262 3,301 1,545 696 691
6.6	Number of staff employed as at 31 March 2026	29
6.7	Number of volunteers available as at 31 March 2026	56
6.8	Number of new volunteers recruited in 2025/26 (12 months)	10
6.9	Number of volunteer hours worked in 2025/26 (12 months)	11,853
6.10	Value of volunteer hours given 2025/26 (12 months)	£441,992
6.11	Please provide a summary analysis to indicate the extent to which the services of CANCAS have benefited clients.	See below

4. Research and Campaigns

Research and campaigns is one of the twin aims of our service – to improve the policies and practices that affect people's lives. This work is led by the experiences of our clients. We gather evidence through collecting and analysing client statistics and advice issue trends through our case recording system

(Casebook). We also use evidence of client's stories recorded by our advisers and caseworkers on evidence forms.

As a service, we have a huge amount of insight and data about the problems our clients and their wider communities face. Through research and campaigns, we use this insight to:

- help us research issues further
- campaign to get decision makers to change policies and practices
- influence decision makers to change policies and practices

We focussed on three campaigns in 2025/2026:

- Cost of Living Crisis: local focus to a national campaign, looking at deficit budgets in particular

- Private Rented Sector Housing issues

- Digital Exclusion: through our pressure and FOI requests Nottinghamshire County Council have re-introduced a telephone application form for Blue Badge applications for those struggling with using digital means. The topic of Digital Exclusion will continue to be a major focus this year. It affects clients in many areas as significant numbers of organisations are becoming more digital, including only offering their best deals online.

5. Case Studies (note that all names in the following case studies are fictitious)

Housing

Sarah came to the drop in at Eastwood as recommended by a friend. Sarah is a single woman, unemployed due to long-term illness and an assured tenant in a Housing Association property. Sarah is under-occupying by one bedroom and is threatened homeless due to rent arrears with court action commenced.

Our Housing Advisers funded by Broxtowe Borough Council assisted with completion of defence paperwork with a proposal of payment and an explanation of how the arrears accrued. We referred Sarah to Nottingham Law Centre for representation and assisted in claiming additional benefits due to Sarah's ill health.

A discretionary Housing payment was awarded and backdated under exceptional circumstances clearing the arrears in full as requested. Update sent to Nottingham Law Centre for the next hearing.

In total we were able to claim additional household income for Sarah of £18,499. No outstanding debt and the threat of homelessness is alleviated. Sarah was relieved that she isn't going to lose her home.

She told the adviser ' you are an angel and I can't thank you enough'.

Financial Resilience

Jodie initially attended for support regarding a benefits appeal, but has also agreed for us to run through a benefit check. This identified several benefit entitlements she has not been claiming. She has recently separated from her partner, but remains in the marital home with her two children.

Jodie is named not on the mortgage and has not contributed financially to the home. She has long term health conditions; we discussed Personal Independent Payments with her, as she has never made a claim. We also identified Disability Living Allowance for her youngest, who has had physical health conditions since birth.

Our benefit check has also identified a partial Council Tax Reduction for her portion of the bill. We discussed Child Benefit as Jodie never received this due to her partners income being too high. Now they are separated we discussed making this application now.

She also queried whether there was any support with moving, as she is now wanting to leave the property. Discussed Homechoice and she was willing to make this application.

Over £15,000 estimated annual additional income for a mum and her children as they go through a time of transition into a single parent household.

Mediation

The following case study illustrates how mediation can help residents address neighbour disputes constructively and reach practical agreements that work for both parties.

The case involved a dispute between neighbouring households relating to the use of a shared driveway and concerns about trees affecting light to a property. One neighbour wished to use part of the shared driveway area as a turning space for their vehicle, while the neighbouring household had concerns about trees on the property boundary which they felt were blocking light from entering their home.

Due to personal circumstances, one of the parties was unable to travel to attend an in-person mediation session. In response to this, the mediation was conducted via telephone, allowing both parties to participate in a way that was accessible and comfortable for them.

Through the support of a trained volunteer mediator, both parties were able to discuss their concerns and explore possible solutions. During the mediation, an agreement was reached allowing part of the shared driveway to be used as a turning circle. At the same time, both parties agreed that the trees would not be removed entirely but would instead be reduced to a manageable height by a qualified tree surgeon.

To prevent future concerns, the parties also agreed that the trees would be maintained regularly to ensure that light into the neighbouring property would not be affected. Both residents expressed satisfaction with the outcome and appreciation for the mediator's support.

Impact: This case demonstrates how mediation can support neighbours to find practical and mutually beneficial solutions, helping to prevent disputes from escalating further while maintaining positive neighbour relationships.

6. Financial Monitoring Information

In accordance with the Service Level Agreement, CANCAS Broxtowe accounts ringfence their core funding to ensure it is used for the benefit of Broxtowe residents. CANCAS Broxtowe has provided the Council with financial monitoring information. The outturn for the year ended 31 March 2026 is as follows:

	Actual £	**Budget £**	**Variance £**
Income			
Benefit in Kind	10,000	10,000	-
Grant (Broxtowe BC)	63,750	63,750	-
Other Income and Donations	21,519	18,000	3,519
Total Income	**95,269**	**91,750**	**3,519**
Expenditure			
Salaries etc.	102,496	105,194	(2,698)
Staff and Volunteer Costs	3,999	4,820	(821)
Office Costs	3,577	-	3,577
Premises	365	-	365
Other Overheads (inc. cross charges)	38,935	54,710	(15,775)
Total Expenditure	**149,372**	**164,724**	**(15,352)**

Note: Figures above are from our Management Accounts. Full audited accounts for 2025/26 are still to be completed. Our audit with the accountants commences in August 2026.

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Resources and Personnel Policy

Complaints Reports 2025/26

1. Purpose of Report

To provide Members with a summary of complaints made against the Council.

2. Recommendation

The Committee is asked to NOTE the report.

3. Detail

This report outlines the performance of the Council in dealing with complaints, including, at stage 1 those managed by the service areas, at stage 2, managed by the Complaints and Compliments Officer and at stage three passed to the Local Government Ombudsman (LGO) or Housing Ombudsman (HO).

- **Appendix 1** provides a trend analysis of complaints upheld at stage 2.
- **Appendix 2** provides a summary of the Council's internal complaints statistics.
- **Appendix 3** provides a summary of the complaints investigated by the Council formally under stage two of the Council's formal complaint procedure.
- **Appendix 4** provides a summary of the complaints determined by the Ombudsman.

In 2025/26, of the 552 stage 1 complaints received overall, 102 were investigated under the stage 2 complaints procedure and 12 were investigated by the LGO. Under the stage 2 complaints procedure, 57 complaints (56%) were not upheld, 42 complaints (41%) were upheld and one was withdrawn (3%).

Further details can be found in **Appendix 2** and **Appendix 3**. The HO investigated 12 complaints made against the Council. Seven complaints were recorded as not upheld, resulting in no further action being required by the Council, five complaints were upheld. Further details can be found in **Appendix 4**.

Appendix 1 includes a trend analysis of the stage 2 complaints received that were upheld. Particular emphasis has been placed on identifying issues and reoccurring themes where a complaint is upheld. Over the course of 2026/27, the Complaints team will further monitor these areas by service to embed learning and improve the Council's processes and practices.

In 2024/25, for comparative data, 429 stage 1 complaints were received overall, 81 were investigated under the stage 2 complaints procedure and seven were investigated by the LGO. Under the stage 2 complaints procedure, 39 complaints (48%) were not upheld, 41 complaints (50%) were upheld and one was withdrawn (2%).

4. Key Decision

Not applicable.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

The cost of compensation is charged either directly to the service or recognised in a central corporate budget. There are no additional financial implications associated with this report. Any significant additional budgets required, above virement limits, would require approval by Cabinet.

7. Legal Implications

The comments from the Head of Legal Services were as follows:

Whilst there are no direct legal implications arising from this report, it is important to note that the Council's approach to handling complaints is within the parameters of the following key pieces of legislation: Part III of the Local Government Act 1974 and Chapter 6 of the Localism Act 2011 (for Housing Services complaints).

8. Human Resources Implications

Not applicable.

9. Union Comments

Not applicable.

10. Climate Change Implications

Not applicable.

11. Data Protection Compliance Implications

This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    Not applicable.

13. Background Papers

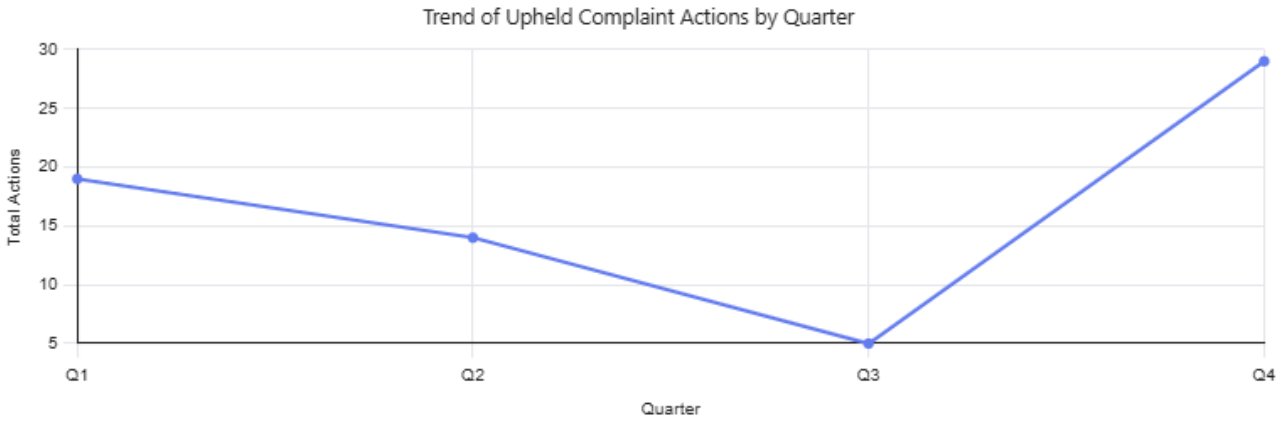
    Nil.

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Trend Analysis (Upheld Complaint Actions)

The total number of upheld complaint actions per quarter is:

- **Quarter 1 (Q1):** 19
- **Quarter 2 (Q2):** 14
- **Quarter 3 (Q3):** 5
- **Quarter 4 (Q4):** 29



Key Insights

There is a steady reduction from 19 (Q1) to 5 (Q3).

This indicates short-term improvement or reduced reporting/resolution actions in early to mid-year.

However this increases to 29 in Q4.

This could reflect:

- Increased complaint volumes
- Improved identification/reporting of issues
- Seasonal pressures (e.g winter-related repairs/damp issues)

This shows a decline in upheld complaints followed by a strong rebound. It should be noted that this suggests reactive rather than sustained improvement measures.

Q1 – Q3 shows a period of corrective actions taking effect (training, reminders, process adjustments).

The increase in Q4 may suggest:

- Issues re-emerging
- Capacity/resource pressures
- More rigorous complaint review processes

Key Pattern (across all quarters)

The Housing Repairs Team, as highlighted above, forms the majority of complaints and upheld complaints every quarter. Other teams appear sporadically and at low volume.

Team	Q1	Q2	Q3	Q4	Trend
Housing Repairs	High	High	Moderate	**Very High**	Increasing long-term
Capital Works	0	0	Low	Moderate	Emerging issue
Housing Allocations	Low	0	0	0	Reduced
Tenancy Services	Low	0	0	0	Reduced
Other teams	Scattered	Minimal	Minimal	Small increase	Stable

The Housing Repairs Team accounts for the majority of upheld actions across all quarters, making it the primary driver of the overall trend spike in Q4.

Q3 dip reflects fewer actions overall, but not a structural shift, just reduced activity in complaints being upheld.

Q4 increase is concentrated in:

- Repairs
- Capital Works (growing contributor)

Root Cause / Theme Analysis

1. Communication Failures (Most frequent across all quarters)

    - Poor updates to residents
    - Lack of contact during delays
    - Leaseholder communication gaps

These issues appear consistently in Q1, Q2, and heavily in Q4.

2. Delays and Timeliness

    - Repairs not booked promptly
    - Delays not escalated
    - Missed timescales

These issues appear consistently in Q1, Q2, and heavily in Q4.

3. Process & Case Management Issues

    - Poor complaint escalation
    - Failure to follow complaint policy
    - Weak monitoring of ongoing actions

These issues appear consistently in Q1 and Q4.

4. Data Quality / Record Keeping

- Inaccurate complaint responses
- Opinion-based or incorrect information recorded

This is mostly present in Q1 and Q2, less so om Q3 and Q4 (suggesting improvement).

5. Pre-tenancy/Property Standards (Emerging Issue)

- Failure to check properties before letting
- Damp and mould identification gaps

This is mostly present in Q2 and Q3. This later evolves into Q4 damp/mould and survey issues.

6. Follow-up & Accountability

- Monitoring repairs
- Reviewing surveys
- Ensuring completion of actions

This becomes significantly more prominent in Q4.

Theme Trend Over Time

Theme	**Q1**	**Q2**	**Q3**	**Q4**	**Direction**
Communication	High	High	Moderate	**Very High**	Persistent issue
Delays	High	High	Moderate	**Very High**	Worsening
Process failures	Moderate	Low	Low	Moderate	Returns in Q4
Data quality	Moderate	Moderate	Low	Low	Improving
Property standards	Low	Moderate	Moderate	High	Growing risk
Follow-up/monitoring	Moderate	High	Low	**High**	Re-emerging

Communication and delays are highlighted as the primary failure pattern

These two issues appear in most upheld complaints, especially:

- Residents are not informed of delays
- Repairs are delayed and are poorly communicated to the resident

The increase in Q4 indicates that learning is not being embedded within the appropriate Teams when complaints are upheld.

Actions for 2026/27

Complaints Team (Democratic Services)

During the course of the 2026/27, the Complaints Team will undertake the following actions to further understand and improve the issues with complaint handling within the Council:

- Review complaints by team (especially Housing Repairs Team, which forms the majority of complaints)
- Categorise themes (communication, delays, repairs, data handling)
- Compare with complaint volumes (to understand if this is rate-driven or volume-driven)
- Introduce quarterly controls to stabilise performance.

Housing Repairs/Capital Works

Further works have been undertaken to improve the coordination between Housing Repairs and Capital Work Teams. This work will be more achievable as the two Teams are now part of the same directorate.

An extra Housing Complaint Officer is currently being considered by Cabinet to assist the existing post with stage 1 complaints, capturing lessons learned and monitoring actions identified as part of the learning.

Having two posts will allow the Housing Department to proactively monitor follow up works identified as part of the complaints process.

A restructure of the Housing Repairs Team, including recruitment to the Housing Repairs Manager, is currently underway. The Housing Repairs Manager will have responsibility for all of the Council's Repairs Operatives to increase oversight of the works being scheduled and undertaken.

A specific Damp and Mould Team will form part of this restructure with a dedicated inspector and clear management responsibility of the Team.

Monthly meetings are taking place between the Housing Complaints Team and Democratic Services Teams to ensure compliance with Housing Ombudsman's Complaint Handling Code and to identify any emerging and resource issues.

The Housing Department are currently undertaking a refresh of the tenant complaint panel, with a new terms of reference and a dedicate membership. As part of this refresh, particular emphasis on will be placed on recommended improvements and compliance with the Housing Ombudsman's Complaint Handling Code.

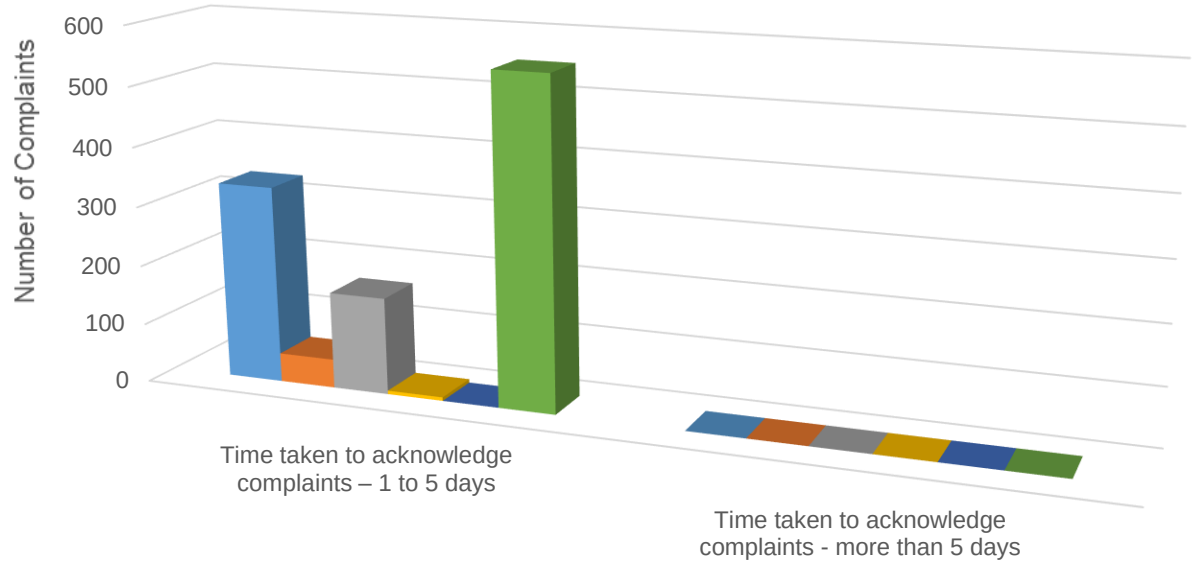
Appendix 2

Complaints received

The table below shows the figures for the overall complaints received in 2025/26 and the previous 2024/25 figures are shown in brackets for comparison.

	Total	**Chief Executive**	**Deputy Chief Executive**	**Executive Director**	**Monitoring Officer**	**Liberty Leisure Ltd**
Number of Stage 1 complaints	552 **(429)**	333	49	164	0	6
No. of complaints investigated under Stage 2	102 **(81)**	85	7	10	0	0
No. of complaints determined by the Ombudsman	12 **(7)**	11	0	1	0	0

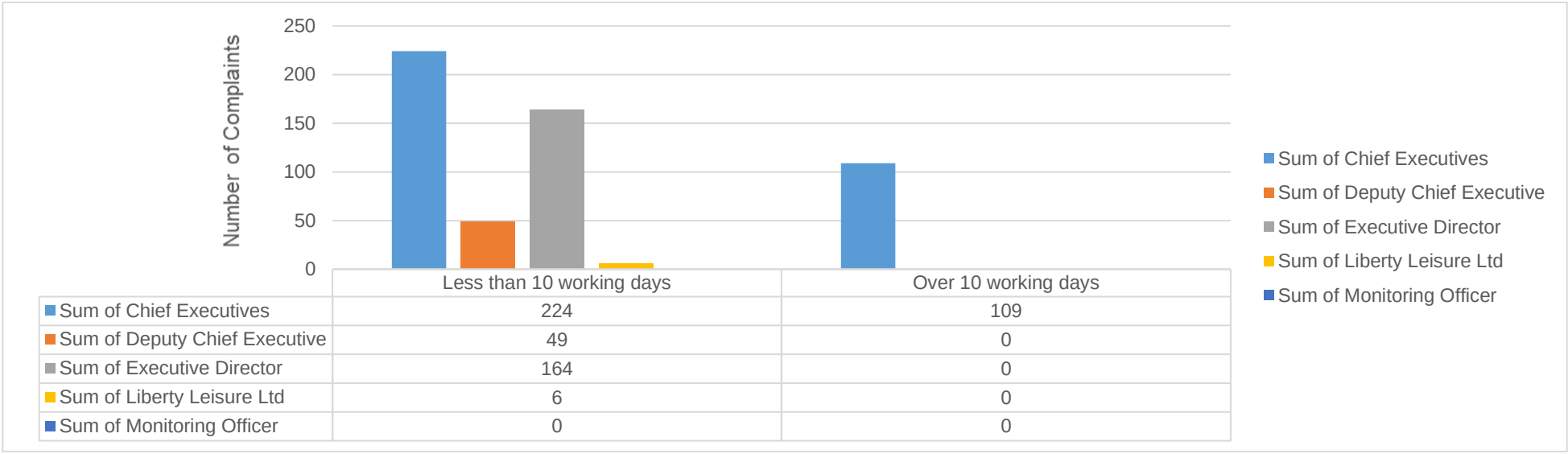
Time taken to acknowledge receipt of stage one complaints (5 working day target)





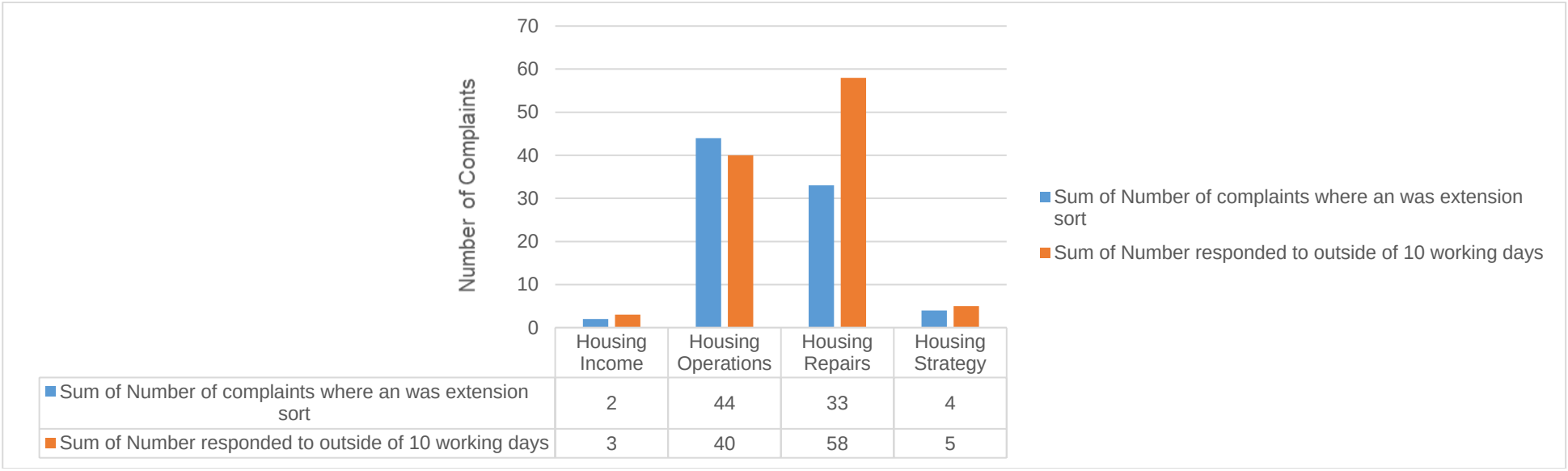
	Time taken to acknowledge complaints – 1 to 5 days	Time taken to acknowledge complaints - more than 5 days
Sum of Chief Executive	333	0
Sum of Deputy Chief Executive	49	0
Sum of Executive Director	164	0
Sum of Liberty Leisure	6	0
Sum of Monitoring Officer	0	0
Sum of Total	552	0

Time taken to respond to stage 1 Complaints (10 working day target)



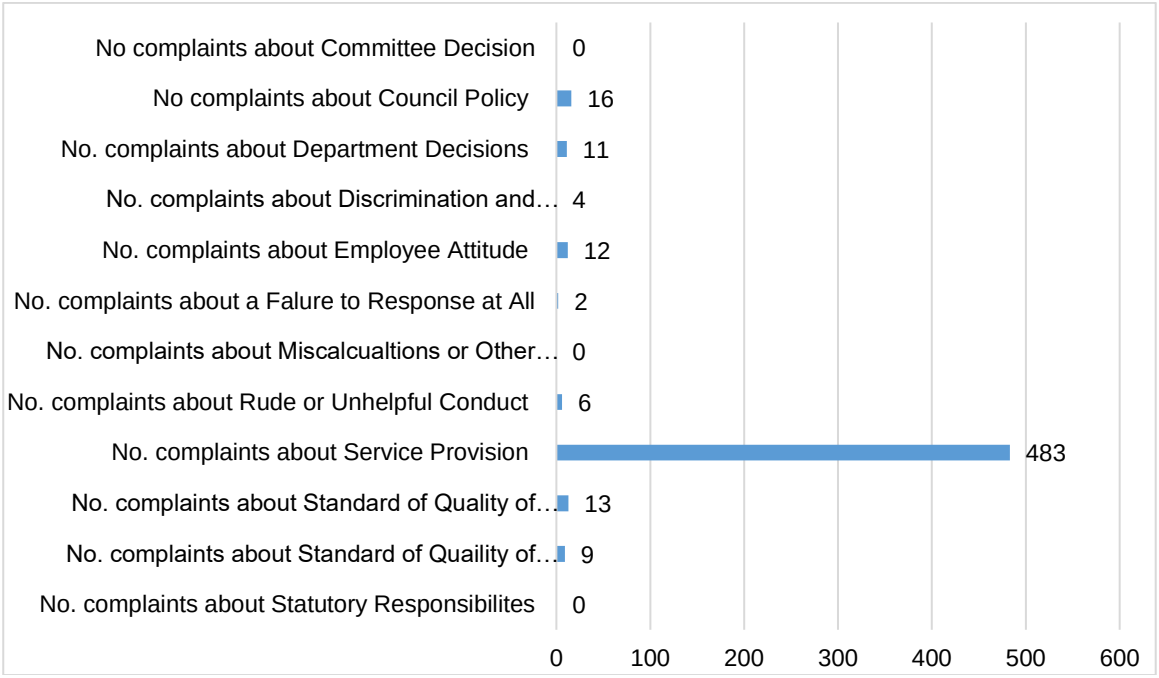
	Less than 10 working days	Over 10 working days
Sum of Chief Executives	224	109
Sum of Deputy Chief Executive	49	0
Sum of Executive Director	164	0
Sum of Liberty Leisure Ltd	6	0
Sum of Monitoring Officer	0	0

Number of complaints that were extended

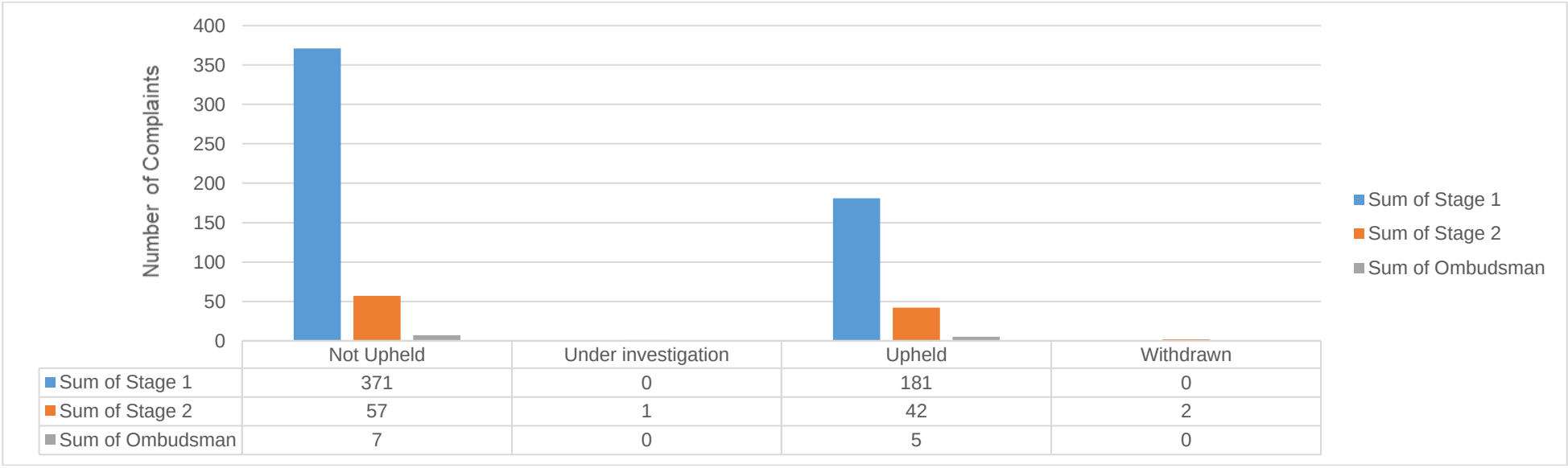


	Housing Income	Housing Operations	Housing Repairs	Housing Strategy
Sum of Number of complaints where an was extension sort	2	44	33	4
Sum of Number responded to outside of 10 working days	3	40	58	5

What the complaints were about



Complaints upheld



	Not Upheld	Under investigation	Upheld	Withdrawn
Sum of Stage 1	371	0	181	0
Sum of Stage 2	57	1	42	2
Sum of Ombudsman	7	0	5	0

Number of stage 2 complaints

	Total	Chief Executive	Deputy Chief Executive	Executive Director	Monitoring Officer	Liberty Leisure
Number of Stage 2 complaints	**102**	85	7	10	0	0

Time taken to acknowledge to stage 2 complaints (5 working day target)

	Total	Chief Executive	Deputy Chief Executive	Executive Director	Monitoring Officer	Liberty Leisure
Acknowledged within 5 working days	**102**	85	7	10	0	0

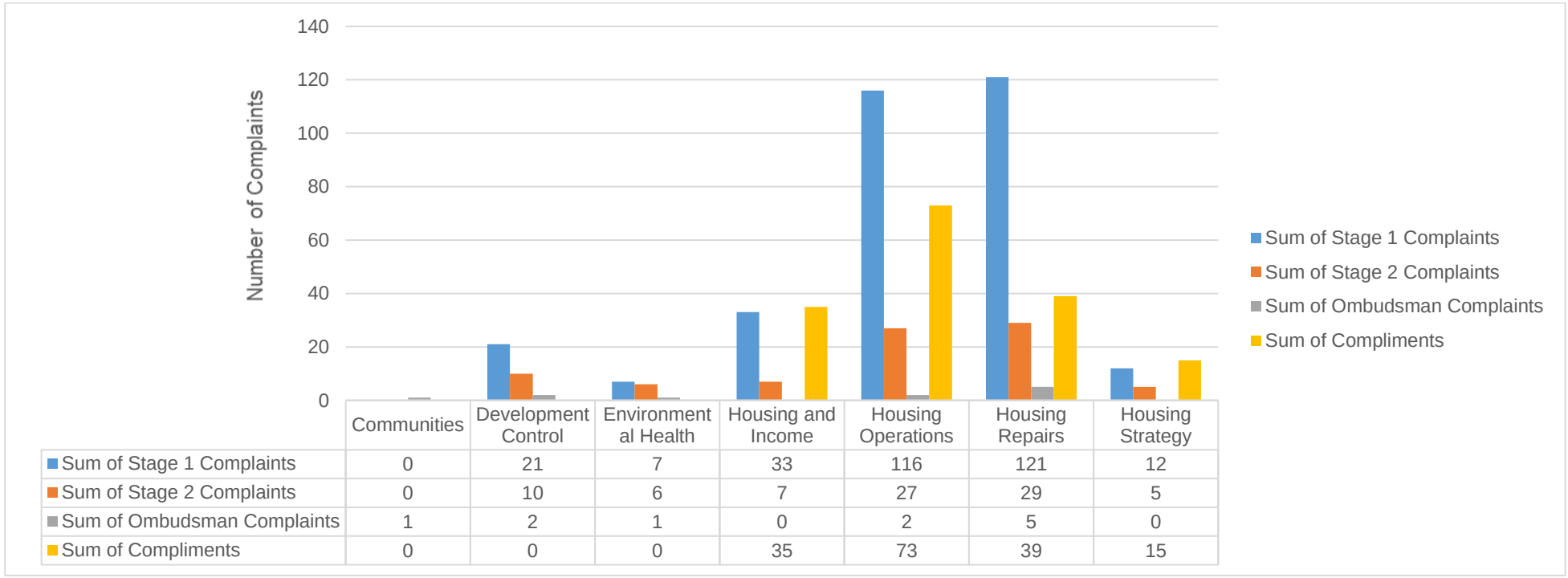
Time taken to respond to stage 2 complaints (20 working day target)



	Less than 20 working days	Over 20 working days
Sum of Chief Executives	85	0
Sum of Deputy Chief Executive	7	0
Sum of Executive Director	10	0
Sum of Monitoring Officer	0	0
Sum of Liberty Leisure Ltd	0	0
Sum of Total	102	0

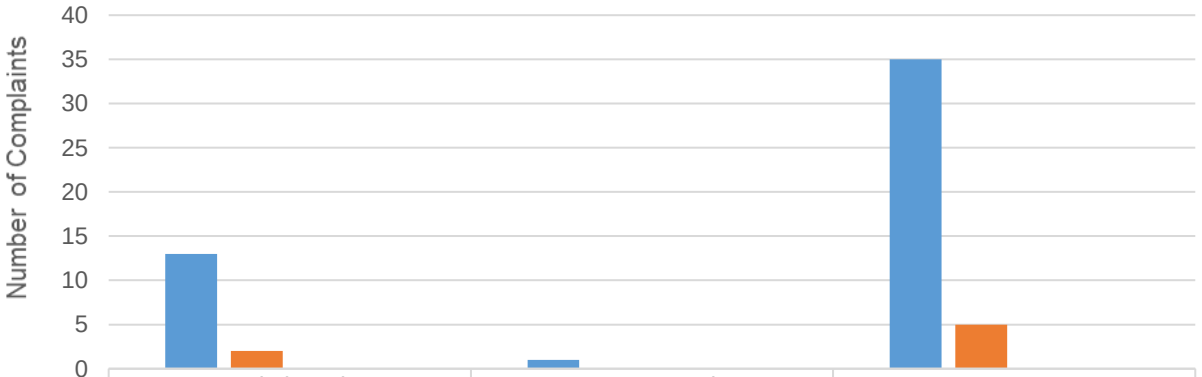
Breakdown of Complaints and Compliments by Department and Section

Chief Executive's Department



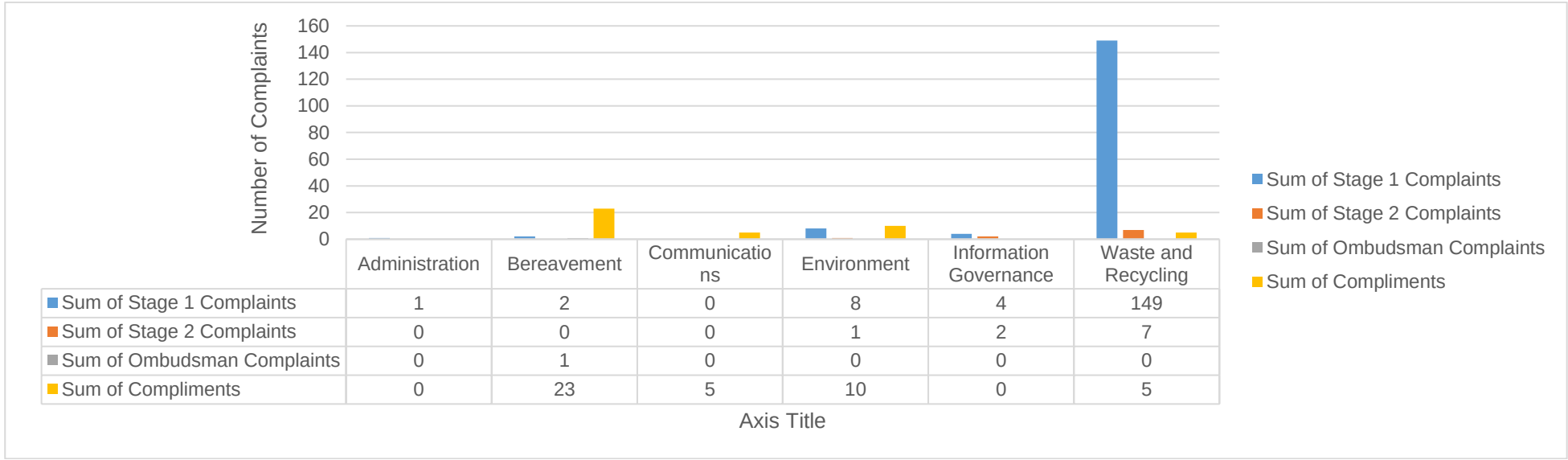
	Communities	Development Control	Environmental Health	Housing and Income	Housing Operations	Housing Repairs	Housing Strategy
Sum of Stage 1 Complaints	0	21	7	33	116	121	12
Sum of Stage 2 Complaints	0	10	6	7	27	29	5
Sum of Ombudsman Complaints	1	2	1	0	2	5	0
Sum of Compliments	0	0	0	35	73	39	15

Deputy Chief Executive's Department



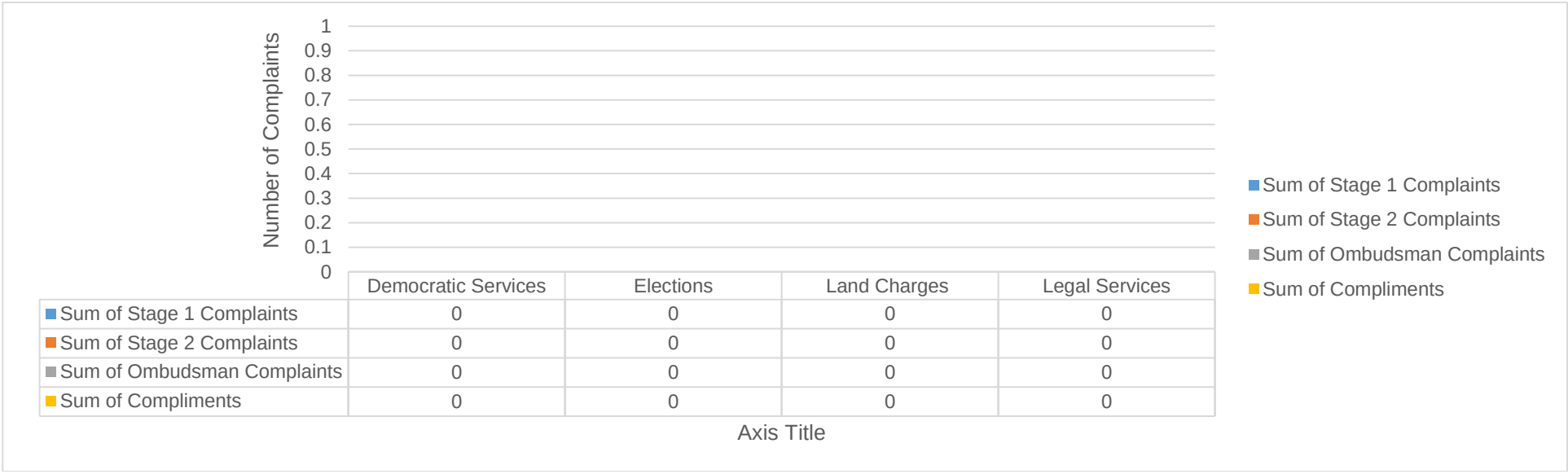
	Capital Works	Customer Services	Revenues
Sum of Stage 1 Complaints	13	1	35
Sum of Stage 2 Complaints	2	0	5
Sum of Ombudsman Complaints	0	0	0
Sum of Compliments	0	0	0

Executive Director's Department



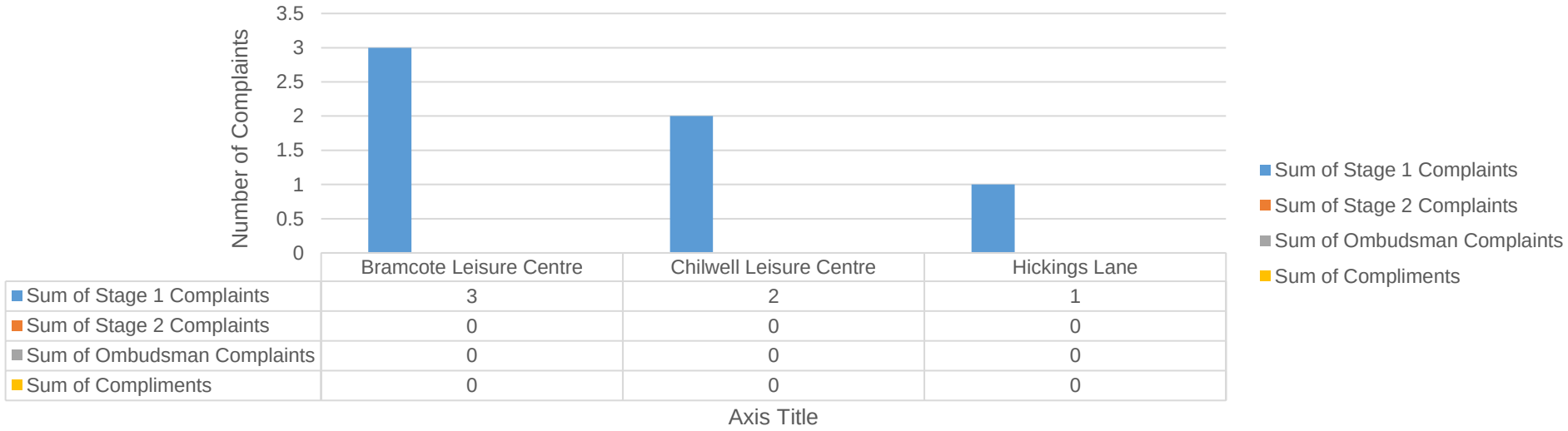
	Administration	Bereavement	Communications	Environment	Information Governance	Waste and Recycling
Sum of Stage 1 Complaints	1	2	0	8	4	149
Sum of Stage 2 Complaints	0	0	0	1	2	7
Sum of Ombudsman Complaints	0	1	0	0	0	0
Sum of Compliments	0	23	5	10	0	5

Monitoring Officer's Department



	Democratic Services	Elections	Land Charges	Legal Services
Sum of Stage 1 Complaints	0	0	0	0
Sum of Stage 2 Complaints	0	0	0	0
Sum of Ombudsman Complaints	0	0	0	0
Sum of Compliments	0	0	0	0

Liberty Leisure Ltd



Financial Settlements

	Total	Chief Execs	Deputy Chief Execs
Stage 1	66 (3)	£24,685 (£3,100)	0
Stage 2	21 (20)	£20,800 (£22,756)	(£314)
Ombudsman	4 (5)	£1,000 (£4,400)	0
TOTAL	91 (28)	£46,485 (£30,256)	(£314)

Stage 2 – Formal Complaints

The complaints provided below have been summarised in order to prevent identification of individuals.

1. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team were incorrectly calculating the number of Houses in Multiple Occupation in a certain area and incorrectly provided this information to the Planning Inspectorate.

Council's response

It was determined that an appropriate level of service was provided as the Planning Team have provided the necessary information to the Planning Inspectorate when required. The Planning Inspectorate had ultimately made a judgement based on their interpretation of this information.

The Planning Team correctly used the Supplementary Planning Document (SPD) to calculate Houses in Multiple Occupation (HMO) density.

Assistant Director Comments

The Planning Team had correctly assessed the number of HMOs in the area based on the SPD. This was provided to the Planning Inspectorate when required.

2. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team incorrectly approved a change in a planning application under Section 73 and 96a of the Town and Country Planning Act.

Council's response

It was determined that an appropriate level of service was provided as the Planning Team had appropriately considered the revised application in line with Section 73 and 96a of the Town and Country Planning Act.

The revised application and changes to construction materials were correctly regularised by the amended applications.

The Planning Committee further reviewed this amended application and determined that it was appropriate. This was subsequently formally approved by the Committee.

Assistant Director Comments

The Planning Team had correctly assessed the application. This was ultimately approved by the Council's Planning Committee.

3. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team had not correctly enforced a Tennis Club's operating hours.

Council's response

It was determined that an appropriate level of service was provided as the Planning Team had correctly investigated the concerns raised about the tennis club and the increased running time.

As the tennis club does not have a restrictive condition on the length of the club activities there has been no breach in planning conditions. Therefore, the Council was unable to take any further action.

Assistant Director Comments

The Planning Team had correctly assessed the operating hours of the tennis club.

4. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team had incorrectly authorised a massage business under Class E.

Council's response

It was determined that an appropriate level of service was provided as the Planning Team had appropriately used Government Guidance in designating the massage business under Class E.

Class E allows for a premises to be changed from offering a professional service to one that offers medical or health services.

Assistant Director Comments

The Planning Team had correctly applied Government Guidance when designating the massage business.

5. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team had not correctly investigated a breach of their right of way to their property.

Council's response

It was determined that an appropriate level of service was provided as the Planning Team had appropriately investigated the alleged breach.

The works undertaken have occurred on private land and would not require planning permission. Therefore, no further action could be undertaken.

Assistant Director Comments

The Planning Team had correctly investigated the issued. This remains a civil dispute between two private land owners.

6. Complaint against Planning

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained regarding the erection of a fences at a neighbouring property which were considered to be a breach of planning, and the subsequent lack of any response to their emails by the Planning Enforcement Team.

Council's response

It was determined that there had been delays in communication and a lack of response being issued to the complainant regarding the planning enforcement case. Furthermore, the Council recognised that there had been a delay in the Planning Enforcement Team concluding the planning enforcement case.

The Planning Enforcement Team determined that a section of the fence was a breach of planning regulations. This section of fence was removed, at the request of the Planning Enforcement Team, and no further action is now required.

An apology was offered to the complainant.

Assistant Director Comments

It is recognised that an appropriate level of service was not provided. The Planning Team recognises the importance of good communication especially when delays are likely.

7. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team did not provide the Planning Committee with all the relevant information to determine a planning application.

Council's response

It was determined that all the relevant information was included in the report which was subsequently reviewed by the Planning Committee.

Furthermore, the Planning Committee visited the proposed development and determined that the original plans did not protect the complainant's amenity enough. This was subsequently altered at the Planning Committee to impose a condition to erect screening to protect their privacy. This condition was approved and the screening has since been erected.

The complainant addressed the Planning Committee under the Council's public speaking to raise their concerns regarding the application.

The Planning Committee considered this information, the information provided as part of the report and site visit and determined that the application was acceptable subject to condition to erect a screen to protect their privacy.

Assistant Director Comments

The Planning Team had correctly including all the relevant information in the reports.

8. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Enforcement Team had not correctly undertaken enforcement against a takeaway sign.

Council's response

It was determined that the Planning Enforcement Team had correctly assessed the signage at the takeaway restaurant.

The Planning Enforcement Team and Planning management had determined that the signage was not expedient to pursue the matter further.

There was no information to suggest that this decision had been undertaken incorrectly.

Assistant Director Comments

The correct decision was undertaken not pursue the matter further as the likely outcome would not be favourable.

9. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Planning Team did not consider the loss of neighbour amenity when determining a planning application.

Council's response

It was determined that the Planning Team had correctly assessed the application and the potential loss of neighbour amenity.

It was determined that there was minimal impact on neighbour amenity to justify conditions that required the side windows to be obscurely glazed.

However, the Council recognises that the submitted and approved plans, while not specifically annotated, showed the side windows drawn with the same effect as the obscurely glazed bathroom window.

While the plans showed the side windows to be drawn with the same effect as the bathroom window there was no obligation for these windows to be obscurely glazed.

Assistant Director Comments

The Planning Team had correctly assessed the application.

10. Complaint against Planning

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that enforcement action has not been taken against a bin store.

Council's response

It was determined that the Planning Enforcement Team had acted correctly in assessing the developments at the front of the complainant's property.

It has been determined that the development had been in place for four years and had since become immune to enforcement action.

Assistant Director Comments

The Planning Enforcement Team correctly assessed the development in line with Planning Legislation.

Housing Repairs

1. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not correctly notify them, as a leaseholder, of the works that where required to a block of flats and that access was required to their garden. Additionally, the complainant's complaint was not escalated correctly by the Housing Repairs Team.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not inform the complainant of the necessity to access their garden to complete works for a Council Tenant.

The Housing Repairs Contractor entered the garden, without permission or notification, to install a drain on the communal land to prevent a damp issue at a Council property. The Housing Repairs Team did not comply with Clause 3 (g) of the complainant's leasehold to provide them with three days' notice before the works were undertaken.

The Council also recognises that the complainant's stage 2 complaint request was not correctly progressed by the Housing Repairs Team. Due to an administrative error, the complaint was not correctly passed to the Complaint Team which resulted in a 6-month delay in the complaint being escalated.

An apology and £500 compensation was offered and accepted.

Assistant Director Comments

It is recognised that the Housing Repairs Team did not correctly comply with the clauses of the Leaseholders lease. Furthermore, the Housing Repairs Team did not escalate the complainant's complaint correctly.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded of their responsibility to notify Leaseholders as per the Clauses set out in their leases.
- The Housing Repairs Team has been reminded of their responsibility to affectively communicate with Leaseholders where access and works are required.
- The Housing Repairs Team has been reminded of the importance of escalating complaints in a timely manner and to avoid delays in line with the Complaints Policy and Complaint Code.

2. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team have not dealt with a damp and mould issue which had left them unable to reside at their property.

Council's response

It was determined that an appropriate level of service was provided as the Housing Repairs Team had appropriately provided remedies to the issues identified relating to the damp and mould during previous complaint investigations.

Furthermore, there was no evidence that suggested that the complainant had been unable to live at their property. While works had been undertaken at the property, these works did not require the complainant to move out.

Assistant Director Comments

All works to remove the damp and mould had been completed. There has been no further reports of this returning and no evidence that suggested that they were unable to live at the property.

3. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with a damp and mould issue at their property, which included repairing the loft space.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not proactively monitor the requirement for the loft works to be rescheduled.

Furthermore, the Housing Repairs Team used incorrect information in the response of the stage 1 complaint by stating that delays occurred in the damp inspection due to access issues.

The Council records highlight that the works to remove the damp and mould from the bathroom have been undertaken in a timely manner.

The Council had appropriately removed the mould from the complainant's bathroom when reported. When it was indicated that this had returned, a full damp inspection was performed by the Council's specialist damp and mould contract. It had been reported that condensation is causing the mould to grow in your bathroom.

The Housing Repairs appropriately inspected the roof and undertook the necessary repairs. However, they were unable to check the loft space as recommended by the specialist damp and mould contractor as the complainant had to leave the property.

A additional inspection was not booked by the Housing Repairs Team which caused delays. The remaining works were booked and undertaken by the Housing Repairs Team.

An apology and £250 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not correctly monitoring the necessity to rebook the loft works.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded of their responsibility to proactively book repairs that cannot be completed on the same day and to monitor these actions until their completion.
- The Housing Repairs Team has been reminded of their responsibility to ensure that they are using accurate information when compiling complaint responses.

4. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with an issue of water hammer in timely manner.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not proactively book an inspection to review the water hammer when this was registered as part of the stage 1 complaint.

Furthermore, the Council's record keeping has been substandard as there is an instance in which the records do not indicate that an inspection took place.

An apology and £750 compensation was offered and accepted. All further works to the water hammer were booked and undertaken.

Assistant Director Comments

The Council recognises the inconvenience caused by not correctly monitoring the necessity to review the water hammer.

Complaint Team Recommendations/actions

The Housing Repairs Team has been reminded of their responsibility to resolve repairs in the first visit. Where this cannot be undertaken, the Housing Repairs Team have been reminded of their responsibility to proactively book and track the repairs until their completion.

5. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with an issue of damp and mould at their property by removing their loft vents. Additionally, a damp survey was undertaken at the property but the results were not shared with the complainant.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team had not recorded the reason for the complainant's loft vents being removed in the first instance.

As these vents had been removed, this may have been affecting the damp and mould at the property. These vents were correctly reinstalled. Furthermore, the Council recognises that by not providing the complainant with the outcomes of the damp surveys the complainant was unable to make an informed decision regarding the condensation at the property and how to treat this.

An apology and £2,000 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not sharing the results of the damp surveys and not recording the reasoning for initially removing the vents at the property.

Complaint Team Recommendations/actions

The Housing Repairs Team has been reminded of their responsibility to provide individuals with the outcome of damp surveys to ensure that they are fully informed of issues identified. This would allow individuals to make informed decisions on how damp and mould can be maintained.

6. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with a faulty hot water system in timely manner.

Council's response

It was determined that an appropriate level of service was not provided as there had been protracted delays in Housing Repairs Team repairing the issue with the heating and hot water.

While works had been undertaken to the heating and hot water, these works had failed, and the operatives did not fully repair the issue for a 3-month period. Furthermore, the Housing Repairs Team did not proactively book or monitor the works required to the heating and hot water which further exacerbated the delays in the full repair being undertaken.

The Council recognises that by not repairing the issues in the first instance, this caused significant delays in the heating and hot water working correctly.

An apology and £1,500 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not repairing the hot water system in the first instance.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded of their responsibility to:
- Resolve repairs in the first visit. Where this cannot be undertaken, the Housing Repairs Team have been reminded of their responsibility to proactively book and track the repairs until their completion.
- Ensure that works are booked in a timely manner to ensure that these are completed promptly.

7. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not repair the window locks at their property in a timely manner.

Council's response

This complaint could not be investigated as the complainant had an active disrepair claim open regarding the same issue. The Council's Complaints Policy states:

"A complaints policy must set out the circumstances in which a matter will not be considered as a complaint or escalated, and these circumstances must be fair and reasonable to residents. Acceptable exclusions include:

- The issue giving rise to the complaint occurred over twelve months ago.
- Legal proceedings have started. This is defined as details of the claim, such as the Claim Form and Particulars of Claim, having been filed at court.
- Matters that have previously been considered under the complaints policy."

8. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with a returning leak in timely manner.

Council's response

It was determined that an appropriate level of service was provided as the Housing Repairs Team had attended the complainant's property and neighbour's property in a timely manner to repair the leaks.

There was no evidence to suggest that the Housing Repairs Team had acted inappropriately when responding to the leaks. The leaks had been repaired on the same day or the following day of reporting and remedial works had been undertaken in a timely manner.

While the Council had taken action to work with the tenant regarding the leaks and the issues had been referred to the relevant safeguarding teams, the Council were unable to provide the exact works or outcomes of these actions due to data protection with the complainant.

Assistant Director Comments

The Housing Repairs Team act promptly when the repairs were reported. Additional support was being provided to the tenant and their property where the leaks occurred.

9. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team did not deal with an issue of damp and mould at their property correctly. Furthermore, the decant property offered to them while the damp works were undertaken was not appropriate.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not offer the complainant an appropriate decant property.

Furthermore, the Housing Repairs Team only offered one option for the decant property despite it not being suitable for the complainant's needs and no further action was taken. This caused the complainant to obtain an alternative arrangement.
The Council recognised that the issue of damp and mould has been persisting at the property for a number of years and it had taken an extended time to resolve this.

While works had been undertaken, follow up actions were required to fully resolve the issues.

An apology and £2,500 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not offering an appropriate decant property in the first instance. Furthermore, the damp and mould issue should not have been delayed in its repair.

Complaint Team Recommendations/actions

The Housing Repairs Team has been reminded of their responsibility to offer appropriate temporary accommodation in the first instance. Where this cannot be met, the Housing Repairs Team have been reminded to proactively look for alternative arrangements.

10. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs Team escalated their gas safety checks to the Legal Department following several access issues.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Teams did not correctly explain the legal letter that was issued to the complainant due to requiring access to their property to ensure it was compliant with gas safety.

While the Council were obligated to issue the letter to ensure that the property was compliant with gas safety, the process and the legal letter could have been explained more clearly by the Housing Repairs Team.

An apology was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by correctly explaining the legal process and the distress this may have caused.

11. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not correctly schedule a damp survey with a specialist contractor in a timely manner.

While the Housing Repairs Team had inspected the property and the damp, by not booking a survey with the specialist damp contractor this further extended the period in which the complainant had reside in the property with a damp issue.

Furthermore, the Housing Repairs Team incorrectly booked a treatment for the damp that would not tackle the root cause of this problem.

The correct survey was booked and the works were undertaken to remove the damp and mould from the property.

An apology and £2,000 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not correctly booking the works to remove the damp and mould at the property.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded of their responsibility to effectively communicate with individuals.
- The Housing Repairs Team has been reminded of their responsibility to correctly identify and book works, especially where specialist contractor involvement is required, in a timely manner.
- The Housing Repairs Team has been reminded of the necessity to identify any damp issue before the commencement of an individual's tenancy.

12. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that they were not notified of works to the communal lighting that caused them disruption.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not notify the complainant of the works to replace the communal lighting at the Whiteley Close flats.

The responsibility of informing residents of the need to replace this lighting was passed to the contractor. However, the Housing Repairs Team did not monitor this communication and subsequently the complainant was not informed of the works taking place.

An apology and £250 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not communicating with resident correctly.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of their responsibility to notify Leaseholders as per the clauses set out in their leases.
- The Housing Repairs Team have been reminded of their responsibility to effectively communicate with Leaseholders where access and works are required.
- The Housing Repairs Team have been instructed to continue to review their communication methods in order to ensure that this service improves.

13. Complaint against Housing Repairs

Response – 20 working days
Withdrawn

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

This complaint was withdrawn during the course of the investigation.

14. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that an issue of a crack at the their property had not been correctly investigated.

Council's response

It was determined that an appropriate level of service was provided as the Housing Repairs Team had promptly investigated the issue of cracking at the complainant's home.

The Housing Repairs Team had attended the property and reviewed the cracks. These cracks were cross-referenced with the previous inspection and it was noted that they had not gotten any worse.

Assistant Director Comments

The correct actions were undertaken to review the cracks. The property remains structurally sound and no further action is required.

15. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that their property was in a state of disrepair when let.

Council's response

It was determined that an appropriate level of service was provided the Housing Repairs Team has appropriately actioned the cleaning and repairs to the property.

The Housing Repairs Team had completed all major works and cleaning of the property before it was let to the complainant.

The Council's records show that the cleaning was completed to a satisfactory standard.

Furthermore, additional works were identified during the viewing of the property were completed in a timely manner following the signing of the tenancy. The Council's records indicate that the complainant agreed that these works would be completed once they had signed the tenancy and moved into the property. The works were subsequently completed in a timely manner following the signing of the tenancy.

Assistant Director Comments

All works were completed in a timely manner and to an acceptable standard.

16. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs did not repair a sewage leak in a timely manner.

Council's response

It was determined that while the Housing Repairs Team had acknowledged the complaint in the correct timeframe, the response exceeded the 10 working day timeframe.

It was noted that as part of the stage 1 complaint, the complainant was offered £250 compensation in recognition of the delays in the complaint response being issued.

There was no evidence to suggest that the Housing Repairs Team acted inappropriately when dealing with the drain blockage.

The Housing Repairs Team attended and cleared the blockage on the same day it was reported. It had been identified that the blockage was the responsibility of Severn Trent by two external contractors. However, the works were completed by the Housing Repairs Team despite this.

The Housing Repairs Team acted appropriately to clear the blockage, cleaned the complainant's property and offer them alternative accommodation while the works were undertaken.

The £250 compensation was re-offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by not responding to the complaint in a timely manner.

All works were correctly undertaken to remove the blockage and leak.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded of their responsibility to effectively communicate with individuals where complaints are delayed.
- The Housing Repairs Team has been reminded to their responsibility to effectively deal with complaints within the correct timeframes.

17. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that their property was let to them in a poor standard.

Council's response

It was determined that an appropriate level of service was not provided as the property was let in a sub-standard condition.

While works were completed before the property was let, the works were not completed to an acceptable standard.

This resulted in the property having several outstanding repairs and substandard decorating.

The works to repair the property and bring it up to standard have since been completed.

An apology and £500 compensation was offered and accepted.

Assistant Director Comments

The Council recognises the inconvenience caused by letting the property in a poor standard. All subsequent works have since been completed to a satisfactory standard.

Complaint Team Recommendations/actions

- The Housing Repairs Team has been reminded to appropriately review properties before they let.
- The Housing Repairs Team has been reminded to book and complete all necessary works before the properties are let.

18. Complaint against Housing Repairs

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

It was determined that an appropriate level of service was provided as the Housing Repairs Team correctly removed the damp and mould when reported.

The Council recognises that delays occurred in the damp and mould being identified at the property in 2023. This issue had previously been concluded and compensation was awarded at this stage.

The current damp and mould issues the complainant was encountering was caused by condensation at the property. This had been identified by two separate specialist contractors.

As part of the complainant's disrepair claim, the contractor identified that the damp and mould was caused by condensation. This was identified as the Council as being not liable for this issue.

All works relating to the damp and mould had been undertaken promptly. However, access could not be gained to the property to complete a mould wash.

Following further reports of damp and mould, the Council arranged for a contractor to review the issues at the property.

It was identified that an internal wall required a damp proof course. However, this works is not linked to the condensation at the property due to the location of the wall and areas that are affected by the condensation.

The work to install a damp proof course has not been scheduled at the complainant's request as they requested the works to be completed after the holiday period.

Assistant Director Comments

The Housing Repairs Team take all reports of damp and mould seriously. All works were completed in a timely manner when reported and have been reviewed by specialist contractors.

19. Complaint against Housing Repairs/Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of a crack at the their property had not been correctly investigated.

Council's response

It was determined that an appropriate level of service was not provided as the Council had failed to undertake a survey at the property to review any potential structural issues.

While this work was passed to the appropriate Department within the Council, due to an oversight, this survey had not taken place.

The survey was booked and subsequently undertaken.

An apology and £250 compensation was offered and accepted.

Assistant Director Comments

It is recognised that distress has been caused by the survey not being booked correctly. This was subsequently prioritised and regular communication is being issued to the complainant.

Complaint Team Recommendations/actions

The Capital Works Team have been reminded to book works in an appropriate timeframe. Where these cannot met, the Capital Works Team have been reminded to communicate with residents to ensure that delays are fully explained.

20. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of a sink leak causing damage to their flooring was not correctly handled.

Council's response

It was determined that an appropriate level of service was not provided as the repairs to kitchen plinths following the leak was not undertaken correctly.

As the plinths were not repaired correctly in the first instance this delayed the overall repair.

An apology was offered for this issue.

The Housing Repairs Team attended the leak in a timely manner and repairs were undertaken on the same day.

There was no information to suggest that the Council has acted inappropriately when repairing the leak. It was understood that this leak may have occurred for a period of time in which the flooring had been damaged.

As the Housing Repairs Team were unaware of the leak, repairs could not be undertaken to prevent further damage to the flooring until it was reported.

Furthermore, the flooring is none standard and would not be repaired by the Housing Repairs Team.

The complainant was advised to make an insurance claim either through their own insurer or the Council's.

Assistant Director Comments

It is recognised that the distress has been caused by not repairing the plinths correctly in the first instance. However, the leak was repaired on the same day when reported.

21. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that a vermin issue had not been correctly dealt with.

Council's response

It was determined that an appropriate level of service was not provided as the repairs to the roof to stop the ingress of vermin was not undertaken correctly.

The Housing Repairs Team had delayed the erection of scaffolding at the property to complete the works to prevent vermin entering the loft space.

The scaffolding erection was delayed by 12 months

Furthermore, by delaying this work, the Council recognises that the preventative measures originally undertaken were not effective.

An apology and £500 compensation was offered and accepted.

Assistant Director Comments

The Council recognises that this delay is unacceptable and caused significant distress.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded for the necessity to complete works in a timely manner.
- Were delays are expected, the Housing Repairs Team have been reminded to contact individuals and informed them of these delays.

22. Complaint against Housing Repairs/Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Repairs/Capital Works Team delayed a survey at the property to determine the source of damp and mould.

Council's response

It was determined that the Council's communication with the complainant had been poor and there had been delays in surveys being booked and an incorrect survey was undertaken.

The Council recognised that an agreed date for communication had not been met.

Furthermore, the Council recognised that the initial survey booked by the Capital Works Team was not correct.

Furthermore, by not booking the correct survey in the first instance this had delayed the conclusion of any potential issues at the property.

An apology and £250 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by delaying the survey to the property.

Complaint Team Recommendations/actions

- The Housing Repairs Team and Capital Works Team have been reminded of the necessity to communicate effectively with individuals.
- Where delays are expected, the Housing Repairs Team and Capital Works Team have been instructed to contact individuals to notify of them of any delays and remain in regular contact until a conclusion is reached.

23. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Out of Hours service was unavailable during an emergency loss of power.

Council's response

It was determined that an appropriate level of service was not provided as the Out of Hours Services was unavailable when the complainant experienced the loss of power at their home.

The Council recognised that this caused distress and inconvenience, especially due to complainant's vulnerabilities.

This matter had been raised with the Out of Hours service provider to review call handling arrangements during this period and to seek assurance that appropriate staffing and escalation arrangements are in place.

However, the loss of power was resolved by the Housing Repairs Team on the same day.

The Housing Repairs Operative that attended the property restored the power and confirmed that the electrics were safe to use.

Assistant Director Comments

The Council recognises the inconvenience caused by the Out of Hours Service being unavailable. Reviews are currently being undertaken in to this service.

24. Complaint against Housing Repairs/Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team/Capital Works Team delayed the inspections and works to the property to remove the damp and mould.

While the Housing Repairs Team undertook several inspections and mould washes, the Council's records indicate that several of the works to remove the damp and mould were not undertaken.

Furthermore, by not correctly undertaking the appropriate works, opportunities were missed to determine the root cause of the damp and mould.

Additionally, the Council failed to undertake the appropriate works to repair a leak at the property, which may have contributed to the damp and mould.

The Council had since identified that there are structural issues at the property and major works are required. These are currently being undertaken and monitored by the Council's Capital Works Team.

The Council recognised that further efforts should have been undertaken to determine the root cause of the issues at the property sooner. As this had not been undertaken, there had been a protracted delay in the repair of the property.

An apology and £4,500 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by delaying the survey to the property.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of the necessity to communicate effectively with individuals.
- Where delays are expected, the Housing Repairs Team been instructed to contact individuals to notify of them of any delays and remain in regular contact until a conclusion is reached.
- The Housing Repairs Team has been reminded of their responsibility to appropriately book damp and mould surveys.
- Where these surveys have been booked, the Housing Repairs Team have been instructed to review these thoroughly to determine if they are fit for purpose.

25. Complaint against Housing Repairs/Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team delayed the inspections and works to the property to remove the damp and mould.

While the Housing Repairs Team undertook several inspections and mould washes, opportunities were missed to undertake a full survey at the property to determine the root cause of the damp and mould.

Furthermore, the Housing Repairs Team did not correctly book a full inspection of the property, at the complainant's request on 20 November 2025, due to an administrative error. This further delayed the works being undertaken to the property to remove the damp and mould.

Additionally, the initial inspection undertaken by the Council's contractor, Baggaley and Jenkins, was deemed that it was not sufficient enough to determine the root cause of the damp and mould at the property.

A follow up survey was undertaken and further works were identified.

An apology and £3,000 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by delaying the survey to the property.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of the necessity to communicate effectively with individuals.
- Where delays are expected, the Housing Repairs Team been instructed to contact individuals to notify of them of any delays and remain in regular contact until a conclusion is reached.
- The Housing Repairs Team has been reminded of their responsibility to appropriately book damp and mould surveys.
- Where these surveys have been booked, the Housing Repairs Team have been instructed to review these thoroughly to determine if they are fit for purpose.

26. Complaint against Housing Repairs

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of rodents entering the property was not dealt with effectively.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team did not correctly follow up the blocking of the entry points at the property in the first instance that resulted in a delay in the pest issue being resolved.

While the Housing Repairs Team correctly undertook the initial works through a contractor to remove the pest issue at the property in January 2026, the follow up works to block the entry points was not scheduled.

The Housing Repairs Team were initially unable to undertake the works to block the entry points until the results of the asbestos survey were received and the pest control treatment was completed. However, this survey was undertaken as a urgent priority and was received a week after the reporting of the pests at the property.

Despite this, the Housing Repairs Team had failed to book the blocking of the entry points at the property until complainant had reported that the initial pest control treatment had failed and further treatments were required in March 2026.

An apology and £500 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by delaying the follow up works and not proactively monitoring this.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of the necessity to proactively monitor and book follow up repairs in a timely manner.

- A review of the procedure of pest control has been undertaken. It has been emphasised that the follow up works are undertaken in a timely manner once the pest control treatments have been completed.

27. Complaint against Housing Repairs

Under investigation.

Complaint

The complainant contacted the Council and complained that their property was left a mess following damp and mould works.

Council's response

This has been put on hold while the complainant gathers further information.

28. Complaint against Housing Repairs

Under investigation.

Complaint

The complainant contacted the Council and complained that an issue of rodents entering the property was not dealt with effectively.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team had delayed the removal of pests at the property.

While initial works were undertaken to cut back trees from the property to stop pests entering the loft space, there was a delay in the Housing Repairs Team booking a pest control service to review the issue.

Furthermore, there was no information to suggest that any further entry points at the property were identified and filled to stop this.

The Council recognises that there was a delay in the stage 1 complaint being registered.

Despite the complaint being raised by a neighbour in January 2026, this was not sent to the Complaint Team until March 2026.

£850 compensation and an apology was offered and accepted.

Assistant Director Comments

It is recognised that the Housing Repairs Team provided a poor service by delaying the works to the remove the rodents. A review of the pest control service is currently being undertaken to determine it effectiveness.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of the necessity to proactively monitor and book follow up repairs in a timely manner.
- A review of the procedure of pest control has been undertaken. It has been emphasised that the follow up works are undertaken in a timely manner once the pest control treatments have been completed.
- The Housing Department has been reminded of their responsibility to comply with the Council's Complaint Policy and the Housing Ombudsman Complaint Handling Code.

29. Complaint against Housing Repairs/Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that an issue of damp and mould had not been rectified at their property.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Repairs Team/Capital Works Team had significantly delayed the repairs to the property.

While some works were completed over the course of 2019-2025, it was evident that the underlying cause of water ingress and damp was not effectively diagnosed or resolved in a timely manner.

The repeated inability to access the 3rd storey loft space significantly hindered proper investigation, and this should have been addressed much earlier. In addition, communication with the complainant fell below the standard expected, and they were left to repeatedly chase updates.

An apology and £3,500 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by delaying the survey to the property.

Complaint Team Recommendations/actions

- The Housing Repairs Team have been reminded of the necessity to proactively monitor and book follow up repairs in a timely manner.
- The Housing Repairs Team have been reminded of the necessity to effectively communicate with residents.

- The Housing Repairs Team have been reminded of their responsibilities regarding complaint handling.
- The Housing Repairs Team have been reminded of their responsibilities to book the appropriate repairs in the first instance.

Housing Income

1. Complaint against Housing Income

Response – 20 working days
Withdrawn

Complaint

The complainant contacted the Council and complained that the Housing Income Team were inappropriately contacting them about their rent account.

Council's response

This complaint was withdrawn during the course of the investigation.

2. Complaint against Housing Income

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that they had not received a response to their enquiry over a bedroom size. Furthermore, they believed the bedroom was too small to qualify for the spare room subsidy they were paying.

Council's response

It was determined that an appropriate level of service was not provided as the outcome of the review of the spare bedroom was not provided in an appropriate amount of time.

The full response was subsequently provided as part of the stage 1 complaint response.

The spare bedroom meets the minimum required standard as set by the Houses in Multiple Occupation guidance.

While the complainant lives in a Council property, these standards are applied to the Council's housing stock.

As the spare bedroom exceeds the standard bedroom size as set out by the Houses in Multiple Occupation guidance it is considered that this room is acceptable and is not exempt from spare room subsidy.

An apology was offered for the delayed communication.

Assistant Director Comments

The Council recognises the inconvenience of not providing the response to the enquiry in a timely manner.

3. Complaint against Housing Income

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had requested that they remove their belongings from the communal areas.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had appropriately requested that the complainant remove their items from the communal areas following a fire safety assessment.

Council undertook this action to ensure that residents are safe in their homes by reducing fire risks.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

4. Complaint against Housing Income

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council contacted them excessively regarding rent arrears.

Council's response

It was determined that an appropriate level of service was provided as the Income Collection Team appropriately contacted the complainant regarding their rent arrears.

The Income Collection Team are obligated to contact individuals with rent arrears. There was no information to suggest that this contact has been inappropriate or harassing in nature.

Assistant Director Comments

The Council had acted appropriately when contacting the complainant regarding their rent arrears.

5. Complaint against Housing Income

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Independent Living Team are required to test their pull cords.

Council's response

It was determined that an appropriate level of service was not provided as the complainant was allowed to enter into an agreement that allowed you to test your own pull cord.

This should not have been offered in the first place and is not standard procedure for the testing of pull cords.

The Independent Living Team subsequently provided the correct information regarding the pull cord testing.

The Council are obligated to test this equipment to ensure that it is working correctly and free of any damage or faults.

The Council will continue to test the pull cord equipment.

This is undertaken to ensure that residents are safe within their homes.

Assistant Director Comments

The Council recognises that this has caused confusion and inconvenience.

6. Complaint against Housing Income

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had issued a tenancy warning to them due to unauthorised alterations to their property.

Council's response

It was determined that an appropriate level of service was provided as the Independent Living Team had correctly applied the terms of the tenancy agreement.

As alterations had been made to the property without permission, the Independent Living Team had appropriately issued the tenancy warnings.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

7. Complaint against Housing Income

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council would not provide a refund for their rent in advance despite only residing at the property for a week.

Council's response

It was determined that an appropriate level of service was provided as the Housing Income Team had correctly advised that a refund of the rent paid in advance cannot be undertaken.

As part of the Council's Tenancy Agreement, new tenants are required to pay rent in advance. As the complainant had signed the Tenancy Agreement, they are obligated to pay the first month's rent despite not residing at the property for the full month.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

Housing Operations

1. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team did not correctly investigate their complaints of Anti-Social Behaviour and opened cases against them.

Council's response

It was determined that an appropriate level of service was provided as the Housing Operations Team are obligated to investigate issues of Anti-Social Behaviour when they are raised.

On the occasion that complaints had been raised against the complainant, the Council were required to investigate these issues. There was no evidence to suggest the Housing Operations Team have acted inappropriately when opening Anti-Social Behaviour cases against the complainant.

The issues the complainant had raised had been appropriately investigated. However, due to the lack of evidence, these issues could not be progressed.

Assistant Director Comments

The Council had acted appropriately and inline with Policies to investigate the Anti-Social Behaviour reports.

2. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team did not correctly consult them on their Independent Living accommodation transferring to General Needs. Furthermore, the Housing Operations Team had not correctly recorded their medical issues.

Council's response

It was determined that an appropriate level of service was provided as the Council had appropriately consulted on the redesignation of their property from Independent Living to General Needs in 2022.

During the consultation process, the Housing Department offered the complainant alterative accommodation in an Independent Living Scheme. However, the complainant chose to stay at their current property.

The Council had requested applicants to submit new applications on the Homechoice system in order for the most up to date information to be registered and used when determining the new applications.

In this instance, the complainant's application was not updated until April 2025, the Council was unable to use their most up to date information to determine their housing band.

Furthermore, the information that had been submitted did not support that their banding requires increasing.

Assistant Director Comments

The Council had acted appropriately when consulting with the individual.

3. Complaint against Housing Operations

Response – 20 working days
Withdrawn

Complaint

The complainant contacted the Council and complained that the Housing Operations Team had not investigated an issue of cats causing a mess in a communal area.

Council's response

This complaint was withdrawn during the course of the investigation.

4. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team incorrectly removed items from a communal area before the expiry of a formal Notice.

Council's response

It was determined that an appropriate level of service was not provided as the Tenancy Services Team removed items from a communal area before the prescribed deadline had expired.

While the Tenancy Services Team had provided the correct notices, it was not appropriate for the Tenancy Services Team to remove the items before the expiry of the Notice.

An apology was offered.

Assistant Director Comments

The Council recognises the inconvenience and distress caused by removing the items from the communal area before the expiry of the Notice.

Complaint Team Recommendations/actions

- The Tenancy Services Team have changed the process of hand delivering Notices to all residents to ensure that individuals are given the full amount of time of the Notice.
- The Tenancy Services Team have changed the process of removing items stored in the communal areas. Items will now be removed and stored, without being disposed of, until the full amount of time given in the Notice has expired. The Tenancy Services Team will notify residents of where these items have been stored and how to collect them, should they wish to.

5. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team delayed a decision as to whether they were able to retain their XL Bully dog at their property.

Council's response

It was determined that an appropriate level of service was not provided as there had been delays in the Council providing the complainant with clarity in the decision made as to whether they were able to keep their XL Bully dog at the property.

The delays to the decision as to whether they were able to keep the dog at the property occurred due to the change in law which did not match the Council's Pet Policy at the time.

The Tenancy Services Team used their discretion to allow the complainant to move into a property and retain the dog.

Furthermore, there was a delay in the Tenancy Options Team registering the complaint.

An apology was offered.

Assistant Director Comments

The Council recognises the inconvenience and distress caused by delay the decision as to whether the complainant's dog could be kept.

Complaint Team Recommendations/actions

- The Tenancy Services Team has been reminded of the importance of escalating complaints in a timely manner and to avoid delays in line with the Complaints Policy and Complaint Code.
- The Tenancy Services Team has been reminded of their responsibility to provide advise regarding tenancy issues in a timely manner.

6. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team did not correctly assess their homelessness application.

Council's response

It was determined that an appropriate level of service was provided as the Housing Options Team considered the application in line with the evidence that had been provided.

The evidence provided through Citizens Advice demonstrated that the complainant did not have a local connection with the Council and therefore were not in priority need of housing.

Furthermore, the evidence provided highlighted that the complainant had a local connection with Milton Keynes Council as they had previously resided there for 6 of the last 12 months.

The information provided through Citizens Advice demonstrated that the complainant had a local connection with Milton Keynes Council and they were subsequently referred to them.

Assistant Director Comments

The Council had correctly assessed the complainant's homelessness application in line with Legislation and internal Policies.

7. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team did not correctly assess their housing application.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Allocations Team had not provided the complainant with the appropriate communication surrounding their housing application.

Furthermore, the Housing Allocations Team closed the complainant's application inappropriately due to a misunderstanding surrounding their employment and how it would affect their local connection.

The Housing Allocations Team did not proactively contact the complainant to resolve the confusion surrounding their local connection.

The Council recognised that the application had been delayed due to the Housing Allocations Team not reviewing the application with the updated information for the complainant's local connection.

An apology and £500 compensation was offered and accepted. The housing application was reopened.

Assistant Director Comments

The Council recognises the inconvenience and distress caused by not proactively checking the information provided by the complainant.

Complaint Team Recommendations/actions

- The Housing Allocations Team have been reminded to communicate effectively with individuals.
- The Housing Allocations Team have been reminded to proactively investigate and contact individuals on the Homechoice system where the evidence remains unclear.
- The Housing Allocations Team have been reminded of their responsibility to review applications on the Homechoise system to avoid unnecessary delays.

8. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team were harassing them by asking them to remove rubbish from their garden, asking them to remove a doorbell camera and wanting to discuss the language used against Council employees.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had contacted the complainant for issues relating to their tenancy.

The Tenancy Services Team are obligated to investigate issues when concerns are raised.

As the issue of the doorbell camera, language used to the Housing Repairs Team and the items/rubbish in the complainant's garden were reported, these required investigation by the Tenancy Services Team.

There was no evidence to suggest that the Tenancy Services Team had treated the complainant unfairly or had acted inappropriately when investigating these issues.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to investigate the Anti-Social Behaviour reports.

9. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Housing Operations Team had requested that they stop parking their car on a communal pathway leading to a block of flats. Additionally, the stage 1 complaint response accused them of laying slabs near the pathway to extend it to a driveway.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Department had included factually incorrect information in the stage 1 complaint response.

The Housing Department, as part of the stage 1 complaint response, stated that the complainant had install additional slabs to create a driveway out of the existing pathway. However, these slabs were in place before the start of the complainant's tenancy.

As the slabs were in place before the complainant's tenancy, the Council recognises that this information has given them the impression of being falsely accused of undertaking this action.

There was no evidence to suggest that the Tenancy Services Team have acted inappropriately when requesting that the complainant does not park on the pathway.

The pathway is the communal entrance to the block flats. It has been reported to the Tenancy Services Team that this is causing an obstruction to other residents. As this has been formally reported, the Tenancy Services Team were obligated to investigate this issue.

The Tenancy Services Team had concluded that by parking on the footpath, this is causing an obstruction to the other residents and a request was made that the complainant does not continue to do this.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to request that the complainant does not park on the communal pathway. However, it is recognised that distress was caused by accusing the complainant of creating the driveway in the first instance.

Complaint Team Recommendations/actions

The Housing Department has been reminded to only include factual information in the responses to complaints.

10. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not dealt with an issue of Anti-Social Behaviour.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team are unable to act upon instances of Anti-Social Behaviour (ASB) without the necessary evidence.

In this instance, as the complainant had not provided any evidence to substantiate the alleged ASB they were experiencing, the Tenancy Services Team were unable to undertake any action.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to investigate the Anti-Social Behaviour reports.

11. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had inappropriately registered their housing needs as requiring one bedroom.

Council's response

It was determined that an appropriate level of service was provided as the Housing Allocations Team have determined the application in line with the information the complainant had submitted.

The information the complainant had submitted did not support that a two-bed property was required.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

12. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not dealt with an issue of Anti-Social Behaviour and the removal of a fence.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had acted appropriately in removing the fence and returning it to its original position.

The Council recognises that this was undertaken due to the complainant's safety concerns. However, as this was undertaken without permission and was causing access issues for other residents, this could not be allowed to remain in the new position.

The Council's records indicate that the reports of Anti-Social Behaviour had been investigated promptly.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to investigate the Anti-Social Behaviour reports.

13. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had inappropriately entered their temporary accommodation property to check on their wellbeing.

Council's response

It was determined that an appropriate level of service was provided as the Temporary Accommodation Team acted upon reports of the complainant's property being unsecure and the fire alarm sounding in a prompt manner.

The Temporary Accommodation Team undertook this action due to genuine concerns for the complainant's safety and acted appropriately to ensure they and their child were safe.

Assistant Director Comments

The Council had acted appropriately on safeguarding concerns to ensure that the resident and their family was safe.

14. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Council had recorded inappropriate comments about them.

Council's response

It was determined that an appropriate level of service was not provided as the Housing Options Team inappropriately included an opinion based record on to the complainant's housing file which stated that they were a racist.

These entries onto housing application should not have taken place as there is no evidence to suggest that this record required entry.

The record has now been deleted from the housing application.

However, due to the language used in the complainant's complaints of Anti-Social Behaviour (ASB) there was sufficient concern from the Housing Department to make a note of their submissions.

An apology was offered to the complainant.

Assistant Director Comments

It is recognised that the opinion based evidence should not be placed on to individual's housing files if these cannot be substantiated.

15. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the banding decision from their Housing Application has been made incorrectly.

Council's response

It was determined that an appropriate level of service was provided as the Housing Options Team have appropriately assessed the complainant's homelessness application in line with the Allocations Policy.

The Housing Options Team had determined that the complainant was not in priority need for housing and had subsequently discharged its homelessness duty.

The was no information that was excluded from the complainant's housing banding review. All information on the housing file had been assessed. The information that had been provided, particularly in regards to the complainant's children, had been reviewed. However, it has been determined that the complainant was not their primary carer and this would not contribute to their banding or property size.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

16. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that their tenancy as ended despite no termination form, valid notice or key return.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had correctly terminated the tenancy.

The Tenancy Service attempted to make contact with the complainant on multiple occasions to determine if they were still residing at the property. As no contact had been made by the complainant, over several months, it was determined that they were no longer living at the property.

The Tenancy Services Team served the correct Notices against the complainant to notify them of the intention to terminate the tenancy and dispose for the remaining items at the property should they not confirm their residence.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

17. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Housing Allocations Team has refused to award them a band 1 priority on the Housing Register twice.

Council's response

It was determined that an appropriate level of service was provided as the Housing Allocations Team had determined the application in line with the information the complainant had submitted.

The information that the complainant had submitted does not support that a two-bed property is required.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

18. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not dealt with an issue of Anti-Social Behaviour.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team are unable to act upon instances of Anti-Social Behaviour (ASB) without the necessary evidence.

In this instance, as the complainant had not provided any evidence to substantiate the alleged ASB they were experiencing, the Tenancy Services Team were unable to undertake any action.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to investigate the Anti-Social Behaviour reports.

19. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had requested that they remove their belongings from the communal areas.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had appropriately requested that the complainant remove their items from the communal areas following a fire safety assessment.

The Council undertook this action to ensure that residents are safe in their homes by reducing fire risks.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

20. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had requested that they remove their belongings from the communal areas.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had appropriately requested that the complainant remove their items from the communal areas following a fire safety assessment.

The Council undertook this action to ensure that residents are safe in their homes by reducing fire risks.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

21. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not dealt with their homelessness application correctly.

Council's response

It was determined that an appropriate level of service was provided as the Housing Options Team had correctly assessed the homelessness applications in line with the Council's Allocations Policy.

There was no information to suggest that the homelessness applications had been incorrectly dealt with. The Council's records indicate that the correct advice and processes had been followed.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

22. Complaint against Housing Operations/Capital Works

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had requested that they remove their belongings from the communal areas.

Council's response

It was determined that an appropriate level of service was provided as the Capital Works Team and Tenancy Servies Team had correctly undertaken the actions relating to the fire risk assessments.

In order for the Council to ensure that residents are safe within their homes, the decision had been made to remove all items from communal areas and areas which could be used to escape a potential fire.

This decision was factored by the recommendation provided by the fire risk assessment undertaken by the contractor, Savilles.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

23. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not dealt with their homelessness application correctly.

Council's response

It was determined that an appropriate level of service was provided as the Housing Options Team had appropriately assessed the complainant's homelessness case.

During the complainant's initial homelessness case in 2024, the Council correctly discharged it's duty when the offer of Derventio Housing Trust accommodation was presented and accepted.

While Derventio Housing Trust was supported housing, and not permanent accommodation, the complainant was appropriately housed for the Council to discharge its homelessness duty as they had accommodation.

Following the complainant's eviction from Derventio Housing Trust, the Housing Options Team had attempted to contact the complainant to assess their current homelessness situation. This contact had been unsuccessful and the Housing Options Team could not progress the current application due to the lack of communication.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

24. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not correctly banded them on the housing register.

Council's response

It was determined that an appropriate level of service was provided as the Housing Options Team had correctly banded the complainant at band 2 with the appropriate number of bedrooms.

While information had been supplied that demonstrates the band 2 allocation, this information did not provide sufficient information for a two bedroom property.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

25. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Council had charged them for the removal of items from a communal garden.

Council's response

It was determined that an appropriate level of service was not provided as the Tenancy Services Team did not correctly assess the items left at the property which were mistaken as being the complainants.

While Tenancy Services Team correctly identified that the items required removing, further investigations were not correctly undertaken to assess as to whether these items belong to the complainant.

An apology and £100 compensation was offered.

Assistant Director Comments

The Council recognises that the correct action was not undertaken to identify the owner of the items that required removal.

26. Complaint against Housing Operations

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not increased their banding despite paying and supplying a doctors letter.

Council's response

It was determined that an appropriate level of service was provided as the Housing Allocations Team had correctly assessed the medical information they had provided.

The information provided was not sufficient enough to provide the complainant with a change of banding.

However, the Council recognises that obtaining this letter has cost the complainant £45 and had caused frustration as this has not affected their banding.

Assistant Director Comments

The Council had acted appropriately and in line with the Allocations Policy.

27. Complaint against Housing Operations

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Council did not provide the correct advice regarding a Discretionary Housing Payment (DHP).

Council's response

It was determined that an appropriate level of service was not provided as the Housing Allocations Team did not provide the correct advice regarding the DHP application.

The Council's records indicate that while an application was submitted, this was undertaken on the same day as the beginning of the complainant's tenancy as advised by the Lettings Officer.

As a DHP application requires completing and processing before the commencement of a tenancy, as this was undertaken on the same day as the start of the tenancy the application was not valid and was rejected.

Furthermore, the Council did not provide the complainant with sufficient time to complete the application for it processed and determined due to the short amount time from the viewing of the property and the tenancy sign up.

An apology and £150 compensation was offered.

Assistant Director Comments

It is recognised that the Council had not provided the complainant with the correct advice. This advice as given by a temporary member of staff who has since left the Council. There is no wider concern that the incorrect advice is being provided in relation to DHP.

Housing Strategy

1. Complaint against Housing Strategy

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that they had been issued a warning for installing a fence at their Leasehold Property despite having planning permission.

Council's response

It was determined that an appropriate level of service was provided as the Housing Strategy Team had appropriately enforced the conditions of the Lease.

The alterations the complainant had made to the property were not permitted as per the terms of the Lease.

Assistant Director Comments

The correct actions were undertaken to enforce the terms of the Lease. While planning permission may have been granted, the Council remain the owner of the land and permission has not been granted to alter the property.

2. Complaint against Housing Strategy

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that their service charge estimate bill was higher than it should be.

Council's response

It was determined that an appropriate level of service was provided as the Leaseholder Team had appropriately issued a service charge estimate.

This estimate is intended to give Leaseholders an overview of the intended charges and this is subject to change.

Assistant Director Comments

The correct actions were undertaken to produce the service charge estimate. This is only an estimate and a final bill is issued detailing all charges.

3. Complaint against Housing Strategy

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that they had been asked to remove a gate that they had installed.

Council's response

It was determined that an appropriate level of service was provided as the Leaseholder Team had appropriately requested that the complainant remove the gate that had been identified as a potential fire risk.

The Council are obligated to comply with the outcomes of the fire risk assessment.

In this case, as the gate has been identified as a risk, the Council is obligated to request that it be removed.

Assistant Director Comments

The Council had acted appropriately and in line with the tenancy agreement.

4. Complaint against Housing Strategy

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that they the Leaseholder Team had not dealt with their complaints of Anti-Social Behaviour correctly.

Council's response

It was determined that an appropriate level of service was provided as the Tenancy Services Team had appropriately investigated the complaints of Anti-Social Behaviour (ASB).

The Tenancy Services Team reviewed the information that had provided in a timely manner and it was determined that there was not enough evidence to pursue any further action.

Assistant Director Comments

The Council had acted appropriately and in line with the Anti-Social Behaviour Policy.

5. Complaint against Housing Strategy

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Homeownership Team had not dealt with an issue of Anti-Social Behaviour.

Council's response

It was determined that an appropriate level of service was provided as the Homeownership and Tenancy Services Team had correctly investigated the complaints of Anti-Social Behaviour and the complaints made against the complainant.

Assistant Director Comments

The correct actions were undertaken to investigate the complaint of Anti-Social Behaviour.

Environmental Health

1. Complaint against Environmental Health

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Private Sector Housing Team inappropriately served them with an Improvement Notice due to the condition of the property they rented as a landlord.

Council's response

It was determined that an appropriate level of service was provided as the Private Sector Housing Team have appropriately contacted the complainant following concerns raised by their tenants.

The correspondence between the Private Sector Housing Team and the complainant had been polite and factual and there was no evidence to suggest that any of the correspondence had been inappropriate.

The Private Sector Housing Team used the relevant information, including site visits, information provided by the complainant's tenant and the complainant to form their conclusion.

The Private Sector Housing Team deemed it to be necessary to issue the complainant with an Improvement Notice due to the condition of your property.

The Private Sector Housing Team had issued the complainant with the necessary guidance in order to improve the condition of their property and how to comply with the Improvement Notice.

Assistant Director Comments

The Council had acted appropriately and in line with Policies to investigate the condition of the property.

2. Complaint against Environmental Health

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Environmental Health Team had not investigated their complaints of Anti-Social Behaviour correctly.

Council's response

It was determined that an appropriate level of service was not provided as the Environmental Health Team had not appropriately managed the complainant's expectations in relation to actions that could be undertaken as part of their Anti-Social Behaviour (ASB) case.

Furthermore, there was a delay in the Environmental Health Team issuing a Community Protection Warning (CPW) and Community Protection Notice (CPN) which led to additional delays in the preventative action being undertaken.

Additionally, the Environmental Health and Communities Teams inappropriately passed the responsibility of the case between themselves instead of collaborating more effectively in jointly resolving the issues. This resulted in complainant having to contact multiple different departments which further led to their distress and confusion.

As two teams of the Council, it was a reasonable expectation that one team (albeit a Team that required collaboration from other Council departments) would need to be contacted in order to progress any issues with the ASB case.

An apology and £3,000 compensation was offered and accepted.

Assistant Director Comments

The Council recognises that the appropriate action was not undertaken correctly which led to delays and distress of the complainant.

Complaint Team Recommendations/actions

- The Environmental Health and Communities Teams have been reminded of their responsibility to appropriately communicate with individuals.
- The Environmental Health and Communities Teams have been reminded to appropriately manage an individual's expectations.
- The Environmental Health and Communities Teams have been reminded to appropriately collaborate to ensure that individuals are supported throughout the ASB process.
- The Environmental Health and Communities Teams have been reminded to issue Notices in a timely manner where clear breaches have been identified and informal approaches to resolve matters have failed.
- The Environmental Health and Communities Teams have been reminded of their responsibilities to identify vulnerability as a potential factor in ASB cases. Where vulnerabilities have been identified the Environmental Health and Communities Teams should look to take these into account in expediting any actions in accordance with the Council's policies.

3. Complaint against Environmental Health

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Licensing Team in appropriately granted a license to a massage business.

Council's response

It was determined that an appropriate level of service was provided as the Licensing Team had appropriately considered the application for the massage and special treatment business.

No objections were raised by Nottinghamshire Police and as part of this process the Environmental Health Team considered the application and had no objections.

Due to this, there was no justification for the license to be refused.

Assistant Director Comments

The correct actions were undertaken to review the license. There was no evidence to suggest that the license should be refused.

4. Complaint against Environmental Health

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Environmental Health Team have not dealt with an issue of rubbish accumulation in a neighbouring garden.

Council's response

It was determined that an appropriate level of service was provided as the Environmental Health Team have appropriately investigated the issues raised regarding the neighbour's garden.

The Environmental Health Team had undertaken the appropriate visits in a timely manner and had issued the correct warnings and notices following the investigation of the garden.

5. Complaint against Environmental Health

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Environmental Health Team have not reconnected their gas supply to their property.

Council's response

It was determined that an appropriate level of service was provided as the appropriate advice had been provided regarding the gas being disconnected from complainant's property.

The Council does not have the power to reconnect the gas or dictate the method in which Cadent would reconnect the gas. This remains an issue between the complainant and Cadent to resolve as a private home owner.

There was no information to suggest that the Environmental Health Team have misinterpreted their enforcement powers. The Environmental Health Team cannot undertake enforcement on Cadent.

Under the Housing Act 2004, if the Council identifies hazards with a dwelling and deem enforcement action is required the action must be taken against the person who has a legal responsibility for the dwelling where the hazard is identified. It does not allow the Council to take action against any person who does not have a legal interest in the property affected.

Assistant Director Comments

The correct actions were undertaken to advice the complainant that as the legal owner of their property they are responsible for the reconnection of the gas supply.

Assistant Director Comments

The correct actions had been taken to investigate the issue raised. These were undertaken promptly and Notices were issued to ensure that the garden is tidied.

Information Governance

1. Complaint against Information Governance

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Information Governance Team had not released the requested data as part of a Freedom of Information request.

Council's response

It was determined that an appropriate level of service was not provided as the Information Governance Team had incorrectly identified the requested information relating to the outcomes of complaints/accusations made against the Council's Senior Management Team as being exempt due to it containing personal data.

Furthermore, the Information Governance Team did provide the complainant with the correct Decision Notice for this refusal as required by the Freedom of Information Act.

The data was subsequently release as part of the stage 2 complaint response.

An apology was offered to the complainant.

Assistant Director Comments

The Council recognises that the information was incorrectly withheld in the first instance and the correct Decision Notice was not provided which led to confusion.

Capital Works

1. Complaint against Capital Works

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Capital Works have refused to install a fence at their property to protect their privacy and their new build property had been built incorrectly.

Council's response

It was determined that an appropriate level of service was provided as the Council and its contractors have correctly built the property in accordance with the approved plans.
The Council was unable to erect a fence around the property as this would interfere with the public highway, the communal access to the properties and would sit flush with the windows.

Furthermore, a fence can only be installed up to 1m on a public highway. Any fence higher that 1m would require planning permission.

There was no information to suggest that the Council had acted inappropriately when constructing the property or in contravention of the Housing Ombudsman Guidance and Housing Act 1996.

Assistant Director Comments

The property has been constructed in accordance with the approved plans and remains a safe place to reside.

2. Complaint against Capital Works

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Council had delayed the works to complete their kitchen replacement.

Council's response

It was determined that an appropriate level of service was not provided as the Council did not communicate the delays in the kitchen being installed.

During the course of the kitchen installation, damp and mould was discovered behind the kitchen cabinets.

While the Council undertook the correct action to have the damp removed and investigated, the delay that occurred due to these works were not communicated with the complainant.

An apology and £500 compensation was offered.

Assistant Director Comments

The Council recognises the inconvenience caused by not communicating correctly with the complainant.

Complaint Team Recommendations/actions

- The Capital Works Team have been reminded of the necessity to communicate effectively with individuals.
- Where delays are expected, the Capital Works Team have been instructed to contact individuals to notify of them of any delays and remain in regular contact until a conclusion is reached.

Revenues, Benefits and Customer Services

1. Complaint against Council Tax

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council Tax Team did not appropriately update a forwarding address which resulted in enforcement action being undertaken.

Council's response

It was determined that an appropriate level of service was provided as the Council Tax Team had correctly issued the Council Tax bills to the address that had been provided.

As notification had not been received of the need to change the forwarding address, the bills continued to be sent to the last known address.

Assistant Director Comments

The Council Tax acted appropriately by continuing to send the Council Tax bills to the last known address.

2. Complaint against Benefits

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Benefits Team had failed to undertake their duties in relation to sections 1, 2, 9, 18 and 42-44 of the Care Act 2014 and has failed to make reasonable adjustments under the Equality Act 2010.

Council's response

It was determined that an appropriate level of service was provided as the Benefits Team had correctly provided the complainant with assistance when making a benefit claim.

There was no evidence information to suggest that the Benefit Team had acted inappropriately toward the complainant or acted outside of the scope of the Care Act and Equality and Diversity Act.

Assistant Director Comments

There is no evidence to suggest the complainant had been treated poorly during their benefit claim.

3. Complaint against Council Tax

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had not allowed them to pay their Council Tax with a Bill of Exchange.

Council's response

It was determined that an appropriate level of service was provided as a Bill of Exchange was not an acceptable form of payment toward Council Tax.

Assistant Director Comments

The correct action was undertaken in rejecting a Bill of Exchange as an acceptable form of payment.

4. Complaint against Council Tax

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that the Council had obtained a Liability Order and then later withdrew it.

Council's response

It was determined that an appropriate level of service was provided as the Liability Order was granted due to arrears on the Council Tax account.

While payments had been made toward the Council Tax bill, these were late which resulted in the account being in arrears. This was sufficient to result in a Liability Order being granted.

However, in recognition of the payments toward the Council Tax Bill, the Council Tax Team ultimately undertook the decision to withdraw the Liability Order.

Assistant Director Comments

The correct action was undertaken in obtaining the Liability Order in the first instance and withdrawing following payments being made toward the arrears.

Environment

1. Complaint against Environment

Response – 20 working days
Withdrawn

Complaint

The complainant contacted the Council and complained that grass cutting had taken place on their property that they did not request.

Council's response

This complaint was withdrawn during the course of the investigation.

2. Complaint against Environment

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Waste Team had failed to collect their garden waste bin on the correct day.

Council's response

It was determined that an appropriate level of service was not provided as the garden waste bin had not been collected correctly.

While the Council had attempted to collect the bin, access issues have prevented this from occurring.

Assistant Director Comments

The Council recognises the inconvenience of not collecting the bin on the designated day.

3. Complaint against Environment

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Waste Team had failed to collect their waste bin on the correct day.

Council's response

It was determined that an appropriate level of service was not provided as the garden waste bin had not been collected on the correct day.

This was a service error and the bin was collected following its reporting.

Assistant Director Comments

The Council recognises the inconvenience of not collecting the bin on the designated day.

4. Complaint against Environment

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that they had been inappropriately given a littering fine.

Council's response

It was determined that an appropriate level of service was provided as the WISE Team were correct in issuing the Fixed Penalty Notice as they had observed the complainant incorrectly disposing of a cigarette.

The body camera footage showed the complainant incorrectly disposing of the cigarette.

Assistant Director Comments

The Council issued the fine correctly as there was clear evidence of littering having occurred.

5. Complaint against Environment

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Waste Team had failed to collect their waste bin on the correct day.

Council's response

It was determined that an appropriate level of service was not provided as the garden waste bin had not been collected on the correct day.

This was a service error and the bin was collected following its reporting.

Assistant Director Comments

The Council recognises the inconvenience of not collecting the bin on the designated day.

6. Complaint against Environment

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Waste Team had failed to collect their waste bin on the correct day.

Council's response

It was determined that an appropriate level of service was not provided as the waste bin had not been collected on the correct day.

This was a service error and the bin was collected following its reporting.

Assistant Director Comments

The Council recognises the inconvenience of not collecting the bin on the designated day.

7. Complaint against Environment

Response – 20 working days
Complaint upheld

Complaint

The complainant contacted the Council and complained that the Waste Team had failed to collect their waste bin on the correct day.

Council's response

It was determined that an appropriate level of service was not provided as the bins had not been collected on the correct day.

This was a service error and the bin was collected following its reporting.

Assistant Director Comments

The Council recognises the inconvenience of not collecting the bin on the designated day.

8. Complaint against Environment

Response – 20 working days
Complaint not upheld

Complaint

The complainant contacted the Council and complained that a overgrown hedge had not been maintained.

Council's response

It was determined that an appropriate level of service was provided as the Environment Team does not have responsibility for the maintenance of the hedge as this was on the highway.

Assistant Director Comments

As the hedge was not the responsibility of the Council, this was referred to Nottinghamshire County Council as the appropriate authority.

Appendix 4

Stage 3 - Ombudsman Complaint

1. Complaint against Communities (complaint concluded in 2024/25) – LGO

Complaint not Upheld.

Complaint

The concern raised was that the Council issued a Community Protection Warning, followed by a further warning of a Community Protection Notice, without any evidence against the complainant.

Ombudsman's conclusion

The LGO found that a Community Protection Notice was issued, which could have appealed in court. Based on this evidence, the LGO have discontinued the investigation.

2. Complaint against Bereavement Services (complaint concluded in 2024/25) - LGO

Complaint not Upheld.

Complaint

The concern raised was that the complainant's memorial garden on their father's grave needed to be removed.

Ombudsman's conclusion

The LGO found that there was insufficient evidence of fault by the Council to warrant an investigation.

3. Complaint against Housing Repairs (complaint concluded in 2024/25) - HO

Complaint Upheld.

Complaint

The concern raised was the Housing Repairs Team handling of reports of a drain blockage.

Ombudsman's conclusion

The HO found that while the Council's repair responses were mostly timely, its failure to follow up a repair following access issues caused distress and inconvenience to the resident. It also failed to consider an escalated response given the repeated issue and the resident's vulnerabilities. Finally, it failed to address the resident's concerns about communication and the safety of their property.

The HO ordered the Council to undertake a £300 compensation payment which has been completed.

4. Complaint against Housing Repairs (complaint concluded in 2023/24) - HO

Complaint Upheld.

Complaint

The concern raised was that the Council did not repair a leaking ceiling in a timely manner.

Ombudsman's conclusion

The HO found that in accordance with paragraph 53(b) of the Housing Ombudsman Scheme, the Council had made an offer of redress prior to investigation which, in the Ombudsman's opinion, satisfactorily resolves the complaint about its handling of a roof leak at the resident's property.

There was a lack of attention to detail in the stage 1 response as the wrong block number was referred to and the Council addressed some unrelated issues that had been mentioned in the December 2015 email that had already been resolved some time ago.

Given it accepted some failings it would have been appropriate for the Council to have offered compensation in its stage 1 response. It is noted however that this was remedied in the Council's stage 2 response where it made an appropriate offer of compensation in line with the remedies guidance for the delays in resolving the roof leak.

The Council was ordered to pay £300 for the handling of the stage 1 complaint. This has been completed.

5. Complaint against Housing Repairs (complaint concluded in 2024/25) - HO

Complaint Upheld.

Complaint

The concern raised was that the Council did not handle a boiler repair appropriately.

Ombudsman's conclusion

The HO found that In accordance with paragraph 53(b) of the Housing Ombudsman Scheme, the Council provided reasonable redress in response to the resident's complaint about its handling of boiler repairs. A payment of £250 compensation was issued at stage 2 of the Council's complaint process.

The resident raised concerns about whether the Council considered her mother's vulnerabilities when it responded to the boiler issues. The HO would expect the Council to consider a resident's needs and vulnerabilities when responding to a boiler not working. The Council attended a day earlier than was required and this indicates that the Council had given the repair an additional priority but did not communicate this clearly to the resident.

The Council acknowledged there were failures in how it responded to the boiler issues and these include:

- The out of hours phone line did not work on the Easter bank holiday Friday.
- Its contractor did not bring overshoes to appointments.
- There was poor communication about when the contractor would be coming for follow up appointments.
- Its contractor did not initially identify why the new boiler was not working.

Overall, the HO were satisfied that the acknowledgement of its failures, apology, and compensation provided by the Council represents reasonable redress for the failures in respect to its handling of the boiler repairs. The compensation that it had paid is in line with what the HO may have awarded for this type of issue and, in their opinion, is proportionate to the impact to the residents.

6. Complaint against Housing Repairs (complaint concluded in 2024/25) - HO

Complaint Upheld.

Complaint

The concern raised was that the Council did not handle a report of a blocked drain.

Ombudsman's conclusion

The HO found that in accordance with paragraph 52 of the Scheme, there was maladministration in the landlord's handling of the repair of blocked drain.

Despite the multiple reports of the same issue and different contractors attending the property, the issue was not resolved to the resident's satisfaction.

It is reasonable for Council to rely on independent and professional contractor's advice. However, as this issue was repeatedly reported and there was a clear dispute on what was causing the blockage, the Council should have considered at an earlier stage an alternative approach or done more to investigate the resident's concerns.

This is particularly important as the resident reported significant inconvenience that they were unable to use their shower for months and the inconvenience caused by the multiple visits. Despite a contractor recommending cameras should be used, this was not done. It would have been appropriate to follow the expert advice. Its failure to consider an escalated response was therefore unreasonable in the circumstances.

The Council was ordered to pay £300 for the handling of the reports of the blocked drain. This has been completed.

7. Complaint against Planning (complaint concluded in 2024/25) - LGO

Complaint not Upheld.

Complaint

The concern raised was that the Council did not consider a planning application correctly.

Ombudsman's conclusion

The LGO would not investigate this complaint about how the Council dealt with a planning application. This is because they were unlikely to find fault.

In this case, the LGO were satisfied the Council properly assessed the acceptability of the development, including the impact on the complainant's, the character of the area and the impact on highway visibility, before granting planning permission. The case officer's report referred to the objections received and explains why the Planning Officer considers the proposal overcomes these.

8. Complaint against Planning (complaint concluded in 2024/25) - LGO

Complaint not Upheld.

Complaint

The concern raised was that the Council did not consider a planning application correctly.

Ombudsman's conclusion

The LGO would not investigate the complainant's complaint because they have the right to appeal to the Planning Inspector.

The complainant has complained about how the Council dealt with his planning application.

They disagreed with how the Council reached its decision to request additional information to support the application and believes it has been dishonest. The complainant says the Council has misinterpreted planning policies and it has approved similar applications in the area.

However, the complainant can choose not to provide the information requested if they does not agree with the Council's reasons for requesting it.

The complainant would have the right to appeal to the Planning Inspector if the Council subsequently decides to refuse permission for the development. The LGO consider it would be reasonable for the complainant to use their right to appeal.

The Ombudsman will not usually investigate when someone has a right to appeal to the Planning Inspector, even if the appeal would not address all the issues complained about.

9. Complaint against Housing Repairs (complaint concluded in 2023/24)

Complaint Upheld.

Complaint

The concern raised was that the Council did not deal with an issue of noise being created by an adjoining stair case.

Ombudsman's conclusion

The Council's stage 1 complaint response set out its position in relation to any repairs needed to the stairs. Which was appropriate. However, its response failed to address the specific concerns the resident raised in their complaint, the noise disturbance. This was an error in its handling of the matter. The resident was inconvenienced by the lack of response to the actual concerns raised.

The Council's stage 2 complaint response went some way to putting the above error right by setting out its position on the noise disturbance from the stairs. It explained its position that no repairs were needed. It also explained it needed recommendations from an Occupational Therapist (OT) before it would install sound proofing. While evidently disappointing for the resident, the Council's position was reasonable. OTs are best placed to understand what specific adaptations are needed based on the needs of an individual. The Council's stage 2 complaint response failed to address the lack of detail and shortcomings of its stage 1complaint response.

While an appropriate position to take, the Council should have been more supportive in terms of assisting the resident with an OT referral/assessment.

The HO ordered the Council to issue and apology and £100 compensation.

10. Complaint against Housing Operations (complaint concluded in 2023/24) - HO

Complaint not Upheld.

Complaint

The concern raised was that the Council did not deal with an issue of noise generated by the building of new Council properties.

Ombudsman's conclusion

It was determined that the complaint was outside of the HO's jurisdiction.

11. Complaint against Housing Operations (complaint concluded in 2024/25) - LGO

Complaint Upheld.

Complaint

The concern raised was that the Council did not deal with an issue of housing allocation correctly during a homelessness application.

Ombudsman's conclusion

The LGO would not investigate the complaint about the Council's decision to end the relief duty after the complainant refused an offer of housing because they have appeal rights, which are reasonable for them to exercise.

In any case, there is insufficient evidence of fault in the Council's decision-making to justify the LGOs involvement.

12. Complaint against Environmental Health (complaint completed in Q3 2025/26) - LGO

Complaint Not Upheld.

Complaint

The concern raised was that the Council did not deal with an rodents at a neighbouring property correctly.

Ombudsman's conclusion

The LGO would not investigate this complaint about the Council's responses to reports of rats living in a neighbour's garden which is in poor condition. There is insufficient evidence that any further investigation would lead to a different outcome.

Cabinet **21 July 2026**

Report of the Portfolio Holder- Housing

Fire Risk Management Programme - Leaseholder Consultation and Future Charges

1. Purpose of Report

For Cabinet to consider the next course of action regarding the utilisation of Section 20 consultation with leaseholders for remedial actions within the Fire Risk Management Programme.

2. Recommendation

Cabinet is asked to RESOLVE that the following is approved:

- **Section 20 consultation commences informally with leaseholders regarding the remaining relevant Fire Risk Assessment (FRA) actions identified within the recent batch of inspections (with no charge insisted)**
- **Section 20 consultation commences formally to coincide with the next batch of FRA inspections (with charge insisted)**

3. Detail

The Council is currently delivering a significant programme of FRA remedial works across its housing stock (under 2,000 fire safety actions to be completed). These works are essential to ensure resident safety, maintain compliance with fire safety legislation, and support the Council's wider building safety responsibilities. A significant proportion of the actions from the recent batch of FRA inspections (completed by Savills) consist of the following:

- Checking (where required):
  - external wall construction with results being shared with external consultants so that any impact on fire safety can be considered
  - compartmentation within identified roof spaces over common areas to confirm that there is adequate separation
  - that the common area fire alarm systems have been designed and installed to support the Stay Put Strategy
  - electrical intake and meter cupboards to confirm that combustible items are not being kept near ignition sources

  - that identified wall and ceiling linings will achieve a surface lining classification aligned to relevant building regulations
  - electrics located within identified common areas are enclosed with relevant fire resisting construction.
- Installing fire resisting glazing where required.
- Updating signs and notices.
- Sealing identified gaps with suitable fire-stopping material.

Under normal circumstances, the Council would be entitled to recover a proportion of costs from leaseholders aligned to Section 20 of the Landlord and Tenant Act 1985. However, the Council has experienced exceptional circumstances during the last six years related to FRA, including;

- Significant amendments to the Fire Safety Act following the Grenfell Tower tragedy in June 2017
- The accumulation of a substantial number of fire remedial actions reaching a peak of circa. 6,000
- Inadequacies with the governance, systems and management instructions of Fire management
- The tragic fire at the Lilacs in June 2025
- The ongoing scrutiny from the Regulator of Social Housing following the inspection in October 2025

Given these exceptional circumstances experienced, the remarkable pace of implementation required to reduce the number of outstanding FRA actions and the evolving nature of fire safety requirements, it is recommended that formal Section 20 consultation with leaseholders is not implemented until the next batch of FRA inspections (at an estimated unclaimed cost of £195,500). It is anticipated that the next batch of FRA inspections will commence in 12 months.

Please note:

- FRA’s have only been completed in General Needs blocks within the current batch of completed assessments by Savills. Prior to this, Section 20 was not an issue because there are no leaseholders within Independent Living

- Approximately 3,000 actions have been completed within this current batch of assessments, totalling an estimated unclaimed cost from Leaseholders of £63,000

- There is the potential to claim an estimated charge of £132,500 to leaseholders for remaining actions. However, this will immediately increase the administrative burden of the FRA programme and increases the risk of delay in completing remedial actions (a typical Section 20 exercise can take between 3-6 months to complete)

- In 2021, Cabinet approved the recommendation of Section 20 exemption aligned to the replacement of entrance doors and windows.

4. Key Decision

   This report is a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012

5. Updates from Scrutiny

   This report is not required to be considered by the Policy Overview Working Group or the Overview and Scrutiny Committee.

6. Financial Implications

   Finance comments will be updated at the meeting as necessary.

7. Legal Implications

   Legal comments will be updated at the meeting as necessary.

8. Human Resources Implications

   Human resources comments will be updated at the meeting as necessary.

9. Union Comments

   Union comments will be updated at the meeting as necessary.

10. Climate Change Implications

    The climate change implications are contained within the report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    As this is not a change to or a new policy an equality impact assessment is not required.

13. Background Papers

    Nil..

Cabinet **21 July 2026**

Report of the Portfolio Holder for Environment and Climate Change

University of Nottingham Retrofit Roadmap

1. Purpose of Report

To provide Members with an overview of the key findings from the University of Nottingham Housing Decarbonisation Report, and to demonstrate how this report will support future housing retrofit, decarbonisation and investment decisions across the Borough.

2. Recommendation

Cabinet is asked to note the findings of the report and to RESOLVE that the use of the retrofit resident information leaflet template, (Appendix 3), as the basis for developing further housing archetype guidance, be approved.

3. Detail

Broxtowe Borough Council has already made significant progress in improving the energy efficiency of its housing stock through a combination of Government-funded and Council-led retrofit programmes.

To date:

- 89 homes received retrofit improvements through Wave 2 of the Social Housing Decarbonisation Fund (SHDF), supported by approximately £2 million of investment.
- 74 homes were retrofitted through Wave 3 during 2025/26, at a cost of approximately £950,000.
- A further 143 homes are programmed for retrofit improvements during 2026/27, representing investment of approximately £1.2 million.
- An additional 130 homes are expected to receive retrofit improvements during 2027/28, with planned investment of approximately £1.15 million.
- Approximately 2,606 Council homes currently achieve EPC Band C or above.
- Around 1,700 Council homes are expected to form part of future investment programmes as the Council continues its journey towards a more energy-efficient and lower-carbon housing stock.
- The Council has secured and committed over £5.2 million of investment in its housing stock, including approximately £3 million of external funding.

This significant programme of investment demonstrates the Council's proactive approach to improving the quality, warmth and energy efficiency of its homes,

reducing carbon emissions, tackling fuel poverty and supporting residents with lower energy costs.

Housing Decarbonisation Roadmap

The Broxtowe Borough Council Housing Decarbonisation Roadmap Report was completed in early 2026 (an Executive Summary of the report is provided in **Appendix 1**). It provided a high-level assessment of retrofit opportunities across both the Borough's private housing stock and the Council's own stock. Its purpose was to identify practical and cost-effective measures to improve energy efficiency, reduce carbon emissions and address fuel poverty, while supporting the Council's commitment to achieving the Government's net zero target by 2050.

The report draws together detailed technical analysis of housing types, energy performance and retrofit interventions and has already informed wider strategic work, including the Local Area Energy Plan and the EMCCA Retrofit Strategy (**Appendix 2**).

At a strategic level, the report sets out a clear and deliverable roadmap for decarbonising the housing stock, based on a staged, fabric-first approach. This prioritises improvements to insulation and building performance in the first instance, followed by the introduction of low-carbon heating systems, with renewable technologies considered where appropriate. The findings demonstrate that a typical, phased retrofit approach can deliver significant reductions in energy demand, carbon emissions and household costs, and is generally more cost-effective and scalable than more intensive "deep retrofit" interventions.

A key outcome of the project has been to translate what is a highly technical piece of work into a format that can be more easily understood and used by residents. To support this, a simplified, leaflet-style summary has been developed to clearly communicate the types of measures that may be applicable to different homes and the benefits they can deliver. A draft version is included at **Appendix 3** and, subject to Member agreement, this will be used as a template and expanded to cover all property types across the Borough.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

There are no direct financial implications arising from the recommendations contained within this report. The production and distribution of the retrofit resident information leaflet will be met from existing approved revenue budgets.

The reports referenced within this paper provide an evidence base to support future housing retrofit, decarbonisation and investment decisions. Any future capital investment programmes, funding bids or retrofit schemes affecting either the Council's housing stock or wider Borough initiatives will be subject to separate approval processes.

7. Legal Implications

The comments from the Head of Legal Services were as follows:

Legal comments are to be updated as necessary at the meeting.

8. Human Resources Implications

Not applicable.

9. Union Comments

Not applicable

10. Climate Change Implications

Improving the energy efficiency of the Borough's housing stock is a key to reducing carbon emissions, with domestic properties which currently accounts for approximately one-third of the Boroughs total emissions. The evidence presented through the Housing Decarbonisation Report, Local Area Energy Plan and EMCC Retrofit Strategy provides a strong foundation for targeting future retrofit activity, reducing fuel poverty, lowering energy consumption and supporting progress towards both local climate ambitions and the UK's Net Zero 2050 target.

11. Data Protection Compliance Implications

This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

Not applicable.

13. Background Papers

Nil.

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DEVELECO

Commissioned by

Broxtowe Borough COUNCIL

Broxtowe Housing Decarbonisation Roadmap



Final Report (Version 3.2)

January 2026

Delivered by Nottingham University Consultants and Develeco Projects Ltd.

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Executive Summary

In early 2024 Nottingham University Consultants and Develeco Projects Ltd were commissioned to identify cost-effective retrofit opportunities to help decarbonise Broxtowe's housing stock, as part as Broxtowe County Council's commitment to meet 2050 net-zero carbon emission targets.

The team built upon the work developed for Nottingham City Council through the £220 million UK Community Renewal Fund between 2021 and 2022. A significant part of this work was focused on developing a method to look at carbon-cost effectiveness of housing retrofit strategies. This method was further developed, updated and applied to examine Broxtowe's housing stock.

In this report, we present the findings in detail. The report is divided into the following sections:

Section 1. Establishing the status quo: in addition to establishing targets, benchmarks and approaches, this also contain a housing stock characterisation and a fuel poverty analysis.

Section 2. Generic housing performance assessment: this section uses generic dynamic building simulation models representing the main housing typologies as identified in Section 1 to quantify the implications (in terms of energy/carbon reduction and running costs) of fabric retrofit alongside low carbon heating and renewable energy integration.

Section 3. Generic housing embodied carbon calculations: the generic models representing the main housing typologies used in Section 2 were used to calculate the embodied carbon emissions of each retrofit strategy (Life Cycle Stages A1-A5, B1-B5, and C1-C43).

Section 4. Specific housing performance assessment: the method used for the generic models in Section 2 were applied to selected properties to quantify the implications (in terms of energy/carbon reduction and running costs) of fabric retrofit alongside low carbon heating and renewable energy integration.

Section 5. Specific housing embodied carbon calculations: the method used for the generic models in Section 3 were applied to the selected properties in Section 4 to calculate the embodied carbon emissions of each retrofit strategy (Life Cycle Stages A1-A5, B1-B5, and C1-C43.

Section 6. Lifetime capital cost of retrofit: the lifetime capital cost for each typology was calculated using the materials, specifications, and quantities as set out within Section 2.3, 3, 4 and 5.

Section 7. Net lifetime cost of retrofit: the net lifetime cost for each typology was calculated considering the lifetime capital cost of the works minus the lifetime cost savings, using the annual energy costs taken from Sections 2 and 4 and the lifetime capital cost data from Section 6.

Section 8. Carbon-cost effectiveness: the cost of the retrofit investment per tonne of carbon dioxide equivalent saved from the atmosphere over the lifetime of the retrofitted property was calculated for each of the properties studied.

Section 9. Broxtowe housing decarbonisation roadmap: in this section, the key data outputs for each typology are summarised and recommendations are suggested alongside estimated projections.

Section 10 is comprised of appendices and Section 11 is a list of references.

Why retrofit?

Retrofitting UK homes is essential for several reasons. First, it enhances environmental sustainability by reducing carbon emissions and improving the longevity of the housing stock. This is crucial for tackling climate change and preserving the environment for future generations. Second, retrofitting improves household energy efficiency, leading to lower energy bills. By upgrading insulation and installing energy-efficient systems, homes will require less energy to maintain comfortable temperatures, resulting in significant cost savings for homeowners and tenants. Third, retrofitting generates local and domestic economic opportunities. As the demand for retrofitting increases, so does the need for skilled labour and the production of energy-efficient materials. This can stimulate local economies and create new job opportunities within the construction industry. Lastly, retrofitting significantly improves the quality of life for occupants. Energy-efficient homes provide consistent temperatures and better air quality, enhancing health and comfort. This is particularly beneficial for vulnerable groups such as the elderly and disabled. Importantly, lower energy costs can help alleviate fuel poverty, making it easier for households to afford other essentials. *Overall, retrofitting homes in the UK is essential for fighting climate change, cutting energy bills, boosting the economy, and improving living conditions. By investing in retrofitting, the UK can create a more sustainable and comfortable future for everyone.*

What is the quality of the homes in Broxtowe?

An overview of the current condition of Broxtowe's complete housing stock (including owner-occupied, privately rented and socially rented) was established utilising data from the Energy Performance Certificate (EPC) database as of April 2024. The EPC database provides details on a building's energy use, typical energy costs, and recommendations for improving energy efficiency. As is typical to the UK, the most common dwelling types in Broxtowe are detached, semi-detached, mid- and end-terrace houses, flats, and detached bungalows, collectively accounting for approximately 95% of the area's properties. Further analysis of the archetypes showed that houses constructed from 1900–1966, flats constructed from 1900–1929 and 1950–1975, as well as detached bungalows constructed from 1950–1975 are less energy efficient (i.e., have EPC ratings D–G) than homes built during other periods. These homes with lower EPC ratings, which make up approximately 66% of Broxtowe's housing stock, have several key characteristics that need improvement. Characteristically, they often feature no or older insulation, outdated heating systems, and single-glazed windows, all which result in higher energy consumption and costs. These homes typically require substantial retrofit upgrades, including better insulation, more efficient heating systems, and possibly the addition of renewable energy sources, to improve their overall energy efficiency. *As these homes tend to have the highest energy costs and the poorest indoor conditions, and given the estimated number found in Broxtowe, they are a priority for retrofitting.*

Why do we need to consider fuel poverty?

Fuel poverty occurs when a household cannot afford to heat their home to an adequate temperature due to a combination of low-income, high-energy costs, and poor energy efficiency of the property. In the UK, a household is considered to be in fuel poverty if it needs to spend a high proportion of its income on energy to maintain a satisfactory heating regime. The government uses the Low Income Low Energy Efficiency (LILEE) definition for fuel poverty in England. Under this definition, a household is considered fuel poor if it lives in a property with an energy efficiency rating of band D or below and, after spending the required amount on energy, its residual income falls below the official poverty line. Fuel poverty can have serious implications for health and well-being, as cold homes can exacerbate conditions such as respiratory and cardiovascular diseases. It can also lead to higher energy bills, forcing households to make difficult choices between heating their homes and other essential expenses. *The rate of LILEE fuel poverty in Broxtowe is 13.5%, which is slightly higher than the English average of 13.1%, but lower than the typical rate across the East Midlands (15.1%).* To get a better understanding of these fuel poverty statistics, a mapping assessment was undertaken to analyse the spatial distribution of LILEE fuel poverty versus deprivation. The findings indicate that the LILEE definition likely underestimates the true extent of fuel poverty in Broxtowe

(and across England), justifying further exploration of subjective fuel poverty rates. Additionally, a rough estimation was done to identify the financially vulnerable households that are omitted by default from LILEE statistics, i.e., those where the main earner is economically inactive and living in a property with an EPC rating of A–C. It was estimated that 1,251 homes fit this description and would likely be categorised as fuel poor according to other fuel poverty definitions. *Knowing the true extent of fuel poverty can drive retrofit initiatives to improve the energy efficiency of homes in Broxtowe, including identifying how to target assistance more effectively.*

What immediate needs does the analysis reveal?

Using data from the EPC database, a housing characterisation review for Broxtowe was conducted to identify key factors to guide the retrofit approach. From this, it was found that 66% of Broxtowe's housing is rated D-G and therefore can be considered energy inefficient and likely need retrofitting to improve performance. Additionally, 88% of Broxtowe's housing stock has gas boilers as the source of heating. The most common wall construction in detached (27.7%), semi-detached (47.5%) and terraced homes (41.9-51.3%) is solid brick with no insulation, and partially/fully insulated cavity walls for flats (30.1%) and filled cavity walls for bungalows (53.5%). Altogether, the proportion of uninsulated and partially insulated cavity walls present a great opportunity for less disruptive fabric improvements across all homes.

EPC data also showed that Broxtowe's housing stock has a large proportion of homes with non-insulated floors – between 44-60% across all typologies. Retrofitting these uninsulated solid ground floors is relatively uncommon because it often requires completely rebuilding the floor, resulting in higher costs and significant disruption for the occupants. Roof insulation is common, but the thickness varies greatly. More than 80% of properties already have double glazing.

We classified retrofit measures as ‘typical’ and ‘deep’. Typical retrofit measures (e.g. adding roof or wall insulation) are those which are generally easier and less expensive to implement, causing minimal disruption to occupants. They typically result in moderate energy savings and performance improvements. Deep retrofit measures, on the other hand, involve comprehensive upgrades across multiple systems, such as the building envelope (e.g., floor insulation), electrical, structural, and mechanical components. These extensive upgrades lead to higher upfront costs and greater disruption for occupants compared to typical retrofits. However, deep retrofit measures can achieve significant performance enhancements and long-term energy savings. *On the whole, the extent to which energy consumption and carbon emissions are reduced depends on the type of retrofit approach implemented and the type of property.*

So, what should be addressed first and why?

Upgrading the building fabric is recommended as the first measure in the retrofit process to improve the energy efficiency of homes. Key measures should include insulating the houses to minimise heat loss through the fabric and improving the airtightness barrier to reduce uncontrolled ventilation between the interior and exterior which is often seen in 'leaky' and draughty homes.

Roof insulation is the easiest retrofit measure and can be one of the first steps in a fabric upgrade. Wall insulation, however, was identified as the most significant fabric measure, proving more effective than other retrofit strategies across all house types. This effectiveness is due to the larger exposed envelope area of the walls compared to other fabric elements. Therefore, retrofitting walls should be prioritised whenever possible.

Installing an air source heat pump (ASHP) proved to be a cost-effective measure for most of the house types tested. Its cost-effectiveness was further enhanced when combined with external wall insulation and draught-proofing.

How much energy could be saved because of implementing the recommended measures?

Overall, the performance analysis indicated that upgrading the fabric and draught-proofing layer could reduce heating demand by up to 86% with extensive fabric measures (deep retrofit). *When fewer, less disruptive, and less expensive fabric measures were considered (typical retrofit), heating demand could be reduced by up to 70% compared to a leaky and non-insulated scenario, depending on the housing archetype.* A breakdown of this is shown for each archetype in Table 0.1.

Table 1: Percentage reduction in heating demand achieved with deep and typical retrofit measures across different heating systems in comparison to a leaky and non-insulated building

Archetype	Deep retrofit measures	Typical retrofit measures
Detached house	81%	61%
Semi-detached	83%	58%
Mid-terrace	86%	70%
End-terrace	86%	70%
Mid-terrace flat	80%	61%
End-terrace flat	81%	52%
Bungalow*	84%	54%

**Bungalow analysis considered a specific housing model, not a generic archetype*.

Greater reductions in total annual energy demand were observed when the traditional gas heating system was replaced with a low-carbon heating system, due to its high efficiency. We assumed a typical efficiency of 0.89 and a seasonal coefficient of performance of 0.8 for a gas boiler and took a realistic approach to the ASHP performance by varying the SCOP from 1.8 to 2.8 for space heating across different retrofit scenarios. Replacing a gas boiler with an ASHP reduced annual energy demand by up to 78% with deep retrofit measures, while maintaining a gas boiler reduced it by up to 61% compared to a leaky and non-insulated building with gas heating. *With typical retrofit measures, total annual energy demand was reduced by up to 73% with an ASHP and up to 49% with a gas boiler, compared to a leaky and non-insulated gas-heated building.* However, it should be noted that the cost-effectiveness of the ASHP compared to the gas boiler will depend on the energy costs of electricity and gas. This breakdown is shown in Table 0.2.

Table 2: Percentage reduction in total energy achieved with deep and typical retrofit measures across different heating systems in comparison to a leaky and non-insulated gas-supplied building

		Deep retrofit measures	Typical retrofit measures
Detached house	Gas boiler	28%	21%
	ASHP	38%	28%
Semi-detached	Gas boiler	22%	15%
	ASHP	42%	32%
Mid-terrace	Gas boiler	33%	27%
	ASHP	33%	20%
End-terrace	Gas boiler	36%	29%
	ASHP	36%	25%
Mid-terrace flat	Gas boiler	27%	20%
	ASHP	38%	31%
End-terrace flat	Gas boiler	30%	19%
	ASHP	41%	29%
Bungalow*	Gas boiler	19%	12%
	ASHP	28%	20%

**Bungalow analysis considered a specific housing model, not a generic archetype*.

Considering the energy price cap that was in place from October to December 2024 (the most recent price cap at the time of the analysis), replacing a gas boiler with an ASHP can reduce annual energy costs by up to 42% when deep retrofit measures are implemented. In comparison, maintaining a gas boiler can lower costs by up to 36% compared to a leaky, non-insulated building. When typical retrofit

measures are considered, annual energy costs can be reduced by up to 32% with an ASHP and by up to 29% with a gas boiler, compared to a leaky, non-insulated gas-supplied building. This energy cost analyses suggested that switching to ASHP resulted in marginally lower annual costs compared to a traditional heating system. It is noted that the adoption of ASHP can help transition to net zero greenhouse gases, and energy costs can be further reduced depending on the electricity cost incentives.

What is the impact of implementing retrofit measures on embodied carbon?

Embodied carbon calculations involve assessing the total greenhouse gas emissions associated with the production, transportation, installation, maintenance, and disposal of building materials, measured in carbon dioxide equivalent (CO_2e). In this project, embodied carbon was considered for the key archetypes and for typical versus deep retrofit measures – this is one of a few instances when the embodied carbon of retrofit was considered in the UK. From this, it was determined that - across all property types - implementing a typical retrofit, as opposed to a deep retrofit, results in a saving of roughly 30-40% in embodied carbon. For example, in the case of a detached house, a deep retrofit results in 12.4 tonnes of CO_2e, whereas a typical retrofit generates 8.7 tonnes of CO_2e. This additional 3.7 tonnes of CO2 must be saved in operational carbon emissions over the lifetime of the property to make the deep retrofit scenario worthwhile. This is not unexpected since the deep retrofit utilises more materials and requires more work.

In the specific embodied carbon calculations undertaken for the specific house type, i.e. the bungalow typology, this trend is replicated. The calculations estimated that typical retrofit results in approximately 28% less embodied carbon compared to a deep retrofit. Specifically, a deep retrofit generates 12.9 tonnes of CO_2e, while a typical retrofit produces 9.3 tonnes of CO_2e. Therefore, the additional 3.6 tonnes of CO_2e from a deep retrofit must be offset by savings in operational carbon emissions over the property's lifetime to justify the deep retrofit. *This concludes that while retrofitting aims to reduce operational carbon emissions by improving energy efficiency, it can also introduce embodied carbon due to the materials and processes involved. To some extent, careful selection of materials and a focus on long-term operational savings can help mitigate its impact.*

What are the cost implications of retrofit measures?

The cost implications of retrofit measures can vary significantly based on their *type and extent*. Key factors to review include *initial cost, payback period, operational savings, embodied carbon, and cost effectiveness.* Typical retrofits, which include roof insulation, draught-proofing, and window upgrades, are generally less expensive and less disruptive, offering moderate energy savings. In contrast, deep retrofits involve comprehensive upgrades such as floor insulation and the installation of advanced heating systems like ASHPs. Although these deep retrofits have higher initial costs due to the extensive work required, they provide substantial long-term energy savings – and significantly improved comfort (which was outside the scope of this work). The payback period for retrofit measures depends on the energy savings achieved and the initial investment, with typical retrofits having a shorter payback period due to lower upfront costs, while deep retrofits take longer to pay off but offer greater savings over time. Despite having higher embodied carbon due to the extensive materials and work involved, deep retrofits can offset this through operational carbon savings over the building's lifetime, making them more environmentally beneficial in the long run. Additionally, it is important to note that the cost-effectiveness of retrofit measures can be influenced by factors such as energy prices, government incentives, and the specific characteristics of the building, with the relative costs of electricity and gas playing a role in the cost-effectiveness of ASHPs compared to gas boilers.

What next for Broxtowe?

Based on the findings of this project, that are discussed in detail across this report, the following recommendations can be made:

Recommendation 1 – Take a fabric-first approach. By prioritising improvements to the building's envelope, such as insulation and airtightness improvements, this method can lead to substantial energy savings by reducing the need for supplementary heating and improving overall energy efficiency. Other benefits include healthier and more comfortable indoor conditions for occupants and reduced operational costs and carbon emissions. As a starting point, the implementation of roof and external wall insulation would be the most impactful in any retrofit strategy.

Recommendation 2 – Integrate a comprehensive framework for managing and delivering retrofit projects and initiatives. The quality assurance process in retrofitting, particularly under the PAS 2035 framework, involves several key steps to ensure that retrofit projects are carried out effectively and meet high standards. By following a framework such as PAS 2035, Broxtowe Borough Council can ensure that their retrofit projects and initiatives deliver the desired energy savings and improvements in building performance without compromising on quality or safety.

Recommendation 3 – Consider the distinct characteristics and benefits of typical versus deep retrofit. Overall, while typical retrofits are suitable for achieving moderate improvements with lower upfront costs, deep retrofits are ideal for those seeking significant energy efficiency gains and long-term benefits. However, the comprehensive upgrades required for deep retrofit, such as floor insulation and advanced heating systems, require substantial investment and extensive work. Consequently, the payback period for deep retrofits can be quite long, making them less financially viable. Additionally, the financial benefits of deep retrofits can be influenced by fluctuating energy prices and the availability of government incentives. Without substantial financial support, the high costs and long payback periods make deep retrofits challenging to justify financially.

Recommendation 4 – Review the cost-carbon effectiveness as part of the decision making. From a whole life carbon reduction perspective, typical retrofits are more effective than deep retrofits when assessed over a 20-year period. They consistently cost less and result in greater whole life carbon savings, making them more carbon cost-effective overall.

Recommendation 5 – *When planning a retrofit, consider that costs can vary significantly depending on the type and extent of the measures implemented.* The retrofit process in this report is divided into three key stages. Stage 1 focuses on fabric improvements to reduce operational energy consumption and carbon emissions. Stage 2 builds on Stage 1 by integrating low-carbon heating systems. Stage 3 further enhances Stage 2 by incorporating renewable energy generation. For example, based on the assumptions outlined in this report, the cost for Typical Retrofit Stage 1 is estimated to be between £11,590 and £35,633, depending on the property type and as relates mainly to estimated capital cost for roof and external wall insulation and other factors detailed in the report. Building up on this, for Typical Retrofit Stage 2 (add low carbon heating), will result in energy bills being 8% to 22% lower than the pre-retrofit scenario, at an estimated cost of between £12,200 and £14,118 per property. Regarding Typical Retrofit Stage 3 (renewable energy generation), it was observed that while solar installations offer the most attractive financial payback compared to fabric and low carbon heating improvements, they are not as effective in reducing whole life carbon over a 20-year period.

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Glossary of Terms and Acronyms

ASHP – Air Source Heat Pump
A low-carbon heating system that extracts heat from the outside air to provide space heating and hot water. Efficiency is measured by its Seasonal Coefficient of Performance (SCOP).

BBC – Broxtowe Borough Council
The local authority commissioning the decarbonisation roadmap.

BEIS – Department for Business, Energy & Industrial Strategy
Former UK Government department (functions now largely transferred to DESNZ) responsible for business, industrial strategy, energy, and climate policy.

BRE – Building Research Establishment
UK-based organisation providing research, standards, and guidance on the built environment.

BSI – British Standards Institution
The UK's national standards body, responsible for publishing PAS 2035 and other construction standards.

BUS – Boiler Upgrade Scheme
A UK Government grant scheme providing funding for the installation of low-carbon heating systems, such as heat pumps.

CCE – Carbon Cost Effectiveness
A measure of the cost per tonne of CO_2e saved over the lifetime of a retrofit intervention.

CESP – Community Energy Saving Programme
A now-discontinued UK Government scheme that funded energy efficiency improvements in low-income areas.

CIBSE – Chartered Institution of Building Services Engineers
Professional body that publishes technical guidance for building services, including thermal performance.

CLC – Construction Leadership Council
Industry body that advises UK Government on construction and infrastructure issues.

COP – Coefficient of Performance
Ratio of useful heating or cooling provided by a system to the energy consumed; higher COP indicates greater efficiency.

DESNZ – Department for Energy Security and Net Zero
Current UK Government department responsible for energy policy and net zero delivery.

DHW – Domestic Hot Water
Hot water used for taps, showers, and appliances.

ECO – Energy Company Obligation
A UK Government energy efficiency scheme requiring suppliers to fund measures in eligible homes.

EPC – Energy Performance Certificate
Official UK document rating a property's energy efficiency from A (most efficient) to G (least efficient), with accompanying recommendations.

EUI – Energy Use Intensity
Annual energy consumption per square metre of floor area (kWh/m²·a), used to benchmark building performance.

EWI – External Wall Insulation
Insulation applied to the outside walls of a building to improve thermal performance and reduce heat loss.

FEES – Fabric Energy Efficiency Standard
A metric for the efficiency of a building's thermal envelope, used in the UK's Future Homes Standard.

FHS – Future Homes Standard
Forthcoming UK regulations aiming to improve energy efficiency and reduce carbon emissions from new homes.

GIA – Gross Internal Area
Total floor area of a building measured to the internal face of perimeter walls.

GLA – Greater London Authority
Regional authority for London, referenced in heat pump performance studies.

GWP – Global Warming Potential
A measure of how much heat a greenhouse gas traps in the atmosphere compared to CO_2.

HVAC – Heating, Ventilation and Air Conditioning
Building systems providing thermal comfort and air quality.

IMD – Index of Multiple Deprivation
A UK measure combining multiple indicators (e.g., income, health, education) to assess relative deprivation.

IWI – Internal Wall Insulation
Insulation installed on the inner face of a wall to improve thermal performance.

LCA – Life Cycle Assessment
An analysis of environmental impacts associated with all stages of a product's life, including embodied carbon.

LETI – London Energy Transformation Initiative
An industry network producing design and performance guidance to achieve net zero buildings.

LILEE – Low Income Low Energy Efficiency
The official definition of fuel poverty in England, combining household income and EPC rating.

LSOA – Lower Layer Super Output Area
A UK geographic unit used for statistical analysis, typically containing 1,000–3,000 residents.

LTHW – Low Temperature Hot Water
Heating water supplied at 35–55°C, typically used with heat pumps for improved efficiency.

MVHR – Mechanical Ventilation with Heat Recovery
A ventilation system that recovers heat from outgoing stale air to warm incoming fresh air.

NDEA – Non-Domestic Energy Assessor
An accredited professional qualified to carry out energy assessments for non-domestic buildings.

PAS – Publicly Available Specification
A type of standard published by BSI; PAS 2035 sets out the framework for domestic retrofit projects.

PER – Primary Energy Renewable
A metric used in Passive House standards, measuring renewable primary energy demand.

PH – Passive House
An ultra-low energy building standard focusing on high insulation, airtightness, and heat recovery.

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1. Establishing the status quo in the UK and Broxtowe

This introductory section starts by setting out the necessity of retrofit for existing homes and identifies the key targets for energy and carbon assessments. Additionally, the results of a review of Broxtowe's housing stock (using EPC data for characterisation purposes) and a fuel poverty analysis are presented.

1.1 Why Retrofit?

Retrofitting homes in the UK is important for several reasons, including:

- Enhancing environmental sustainability, and ensuring the long-term health of the housing stock;
- Bettering household energy efficiency, and consequently lowering energy bills;
- Generating local and domestic economic opportunities; and
- Improving occupants' quality of life.

From an environmental sustainability perspective, retrofitting homes can help reduce greenhouse gas emissions and address climate change. Buildings are responsible for 49% of total greenhouse gas emissions in the UK, with domestic buildings representing 22% of this (LETI, 2020). As its stands (July 2024), new homes tend to fall short of 2030 proposed targets of achieving EPC ratings of C or above for privately rented and social properties (Department for Energy Security and Net Zero, 2025) in support of the Government's 2050 net zero greenhouse gases emissions goals, meaning they will need to be retrofitted further to achieve a suitable energy efficiency standard. Carbon dioxide is the main source of pollution and therefore where efforts are concentrated. Existing homes fair even worse as the majority were built before 1990, which preceded the adoption of more stringent energy standards (Passivehaus Trust, 2022). These existing homes are likely to comprise around 80% of the 2050 housing stock (Passivehaus Trust, 2022). The continued allocation of resources to reduce housing sector emissions is a crucial aspect of efforts to meet the UK's 2050 net zero target.

There are also household-level and broader economic benefits associated with retrofitting. For homeowners and tenants, improved energy efficiency results in lower utility bills. For example, fabric improvements such as insulation can drastically reduce the amount of energy required to keep homes warm in the winter or cool in the summer. Consequently, consumer energy costs should reduce, as should the number of homes experiencing fuel poverty. Additionally, as the UK construction industry adapts to modern retrofitting requirements, there is scope for local economic growth, given the likeliness of a corresponding rise in demand for skilled labour and the manufacture of energy efficient materials.

The energy efficiency benefits of retrofitting are indisputable. An integrated retrofitting approach includes fabric improvements (e.g. upgrading insulation, reduction of air leakage), the installation of energy efficient heating systems (often associated with mechanical ventilation and heat recovery, with air filtering), the adoption of renewable alternatives and the elimination of reliance on fossil fuels. All of these dimensions of retrofitting have the potential to significantly improve the energy efficiency of existing homes and contribute to the decarbonisation of the grid (LETI, 2020). The most crucial implication of having more energy efficient homes is a reduction in overall energy demand, which eases the strain on the national grid and contributes to national energy security.

Improving people's quality of life is also achievable through retrofitting. From a health and comfort perspective, energy efficient homes provide desirable indoor conditions, including consistent temperatures and controlled ventilation, resulting in healthier living conditions. This is especially

important for those who are most vulnerable to the negative health consequences of cold living conditions, such as elderly and or disabled people. As previously discussed, retrofitting can contribute to the alleviation of fuel poverty by lowering running costs, however, other factors such as income poverty, inflation and energy market fluctuations are also important. The recent rise in typical energy costs, particularly from 2021–2022, and the coinciding cost of living crisis, placed many households in the UK at increased risk of fuel poverty. In such economic conditions, many low-income homes are forced to make involuntary trade-offs between necessities, often described as the “heat-or-eat dilemma.” Although fuel poverty is a complex multidimensional issue, retrofitting can contribute to the alleviation of fuel poverty in cases where inefficient housing is the root cause.

In summary, retrofitting existing homes in the UK is necessary to address the critical challenges of climate change and fuel poverty. Through ambitious retrofitting projects, the UK can make significant strides towards ensuring a sustainable and resilient housing stock, improving people’s quality of life, and achieving domestic climate change targets.

1.2 Targets and Benchmarks

This section sets out the UK’s current approach to the net zero agenda.

1.2.1 UK Net Zero Approach and Policy

The UK Government aims to achieve net zero greenhouse gases emissions by 2050, legislated under the Climate Change Act 2008 (2050 Target Amendment) Order 2019. In the building sector, the UK Government’s net zero targets have a focus on reducing operational carbon emissions, which requires that buildings reduce the use of non-renewable (i.e., fossil fuel) energy. Operational carbon emissions result from the energy used for standard functions within the building, including heating, cooling, hot water, ventilation, lighting, cooking and any other electrical appliances . Throughout a building’s life cycle, operational carbon emissions constitute the largest direct environmental impact, representing 40–65% of whole life carbon emissions (LETI, 2020).

As renewable energy production increases and the grid is gradually decarbonised, integrating electric heating sources like heat pumps can help buildings reduce carbon emissions sooner. However, as the grid has limited capacity, and because shifting to electric heating systems is only feasible if energy consumption is significantly reduced, prioritising reduced energy consumption through efficient building design strategies (fabric-first principles) is crucial.. Additionally, current electricity costs remain higher than gas. In April 2024, electricity costs were approximately four times higher than gas (Ofgem, 2024). Under the energy price cap running from October 1 to December 31, 2025, electricity costs are set at approximately four times more than gas, (26.3 pence per kWh compared to gas at 6.3 pence per kWh) (Bolton, 2025). This is known as "The Spark Gap” and sadly can hinder the adoption of cleaner energy technologies like heat pumps as hastily transitioning from gas to electric heating would likely raise energy bills for most UK households, unless consumption fell considerably.

The need to reduce carbon emissions becomes significantly more complex when embodied carbon emissions are included. Embodied carbon accounts for emissions generated by the production, transportation, assembly, maintenance, and the disassembly of building materials, components, or entire buildings. The term *whole life carbon* refers to the consideration of both operational and embodied carbon emissions. Approximately 80% of building sector carbon emissions are operational emissions from the existing building stock, while the remaining 20% is attributable to the embodied impact of new constructions . However, as buildings become more energy efficient and electricity generation decarbonises, the operational carbon of new buildings will decrease, hence, embodied carbon will likely contribute a greater proportion of whole life carbon emissions.

The UK net zero agenda was initiated in 2017 with the Government's publication of the 'Clean Growth Strategy,' which aimed to upgrade all existing homes to EPC B and C standards by 2035. This strategy underscores the critical role of local authorities in developing strategic plans to meet carbon and energy targets. Since 2017, the Government has introduced various grants and funding programs to promote housing retrofits and the installation of low-carbon heating systems, some managed by authorities and others by homeowners. However, these programs lack an effective strategy to address the problem comprehensively, as they are not sizeable enough to enable whole-house retrofits (UKGBC, 2021). Instead, most funding schemes focus on isolated home improvements, such as loft insulation or replacement heating systems, which do not necessarily reduce energy bills or carbon emissions, nor enhance energy efficiency or the comfort and health of occupants (see more on this discussion in Section 1.9). Some of the aforementioned programs are listed next.

Warm Homes: Social Housing Fund Wave 3 (DofESNZ, 2024)

- Launched in 2024, the Warm Homes: Social Housing Fund (WH:SHF) Wave 3 aims to upgrade social housing stock in England to at least Energy Performance Certificate (EPC) band C.
- It targets local authorities, combined authorities, registered providers of social housing, and registered charities that own social housing, providing funding to install energy efficiency upgrades and low-carbon heating measures.
- The program offers up to £7,500 per home for energy performance improvements, with an additional £20,000 available for low-carbon heating measures for up to 10% of homes in a bid, requiring no co-funding.
- Eligible improvements include insulation, solar panels, heat pumps, smart controls, and other energy efficiency and low-carbon heating measures.
- The fund seeks to deliver warm, energy-efficient homes, reduce carbon emissions, tackle fuel poverty, support green jobs, and develop the retrofit sector.

Energy Company Obligation (ECO 4) (OFGEM, 2025)

- Launched in 2022, the Energy Company Obligation (ECO4) scheme is a government initiative to improve the energy efficiency of low-income and vulnerable households in Great Britain.
- It requires energy suppliers to fund energy-saving measures, such as insulation and low-carbon heating, in eligible homes to reduce energy bills and carbon emissions.
- ECO4 focuses on upgrading the least energy-efficient homes, targeting properties with an Energy Performance Certificate (EPC) rating of D or below.
- The scheme prioritises households in fuel poverty, social housing, and those receiving certain means-tested benefits.
- Eligible measures include loft and cavity wall insulation, solid wall insulation, heat pumps, solar panels and heating system upgrades.
- ECO4 is part of the UK’s wider strategy to achieve net-zero emissions and alleviate fuel poverty by improving home energy efficiency.

Boiler Upgrade Scheme (Ofgem, 2025)

- Running from 2022 to 2025, this scheme supports homeowners in installing low-carbon heating systems, such as heat pumps.
- It offers £5K for air source heat pumps and biomass boilers and £6K for ground source heat pumps through certified provider. (Ofgem, 2025)
- To be eligible, properties must have an installation capacity of up to 45kWth and a valid EPC with no outstanding recommendations for loft or cavity wall insulation, with exemptions for listed buildings, conservation areas, or specific structural types.

Public Sector Decarbonisation Scheme (BEIS, 2021a), (BEIS, 2021b)

- Launched in 2020, the Public Sector Decarbonisation Scheme (PSDS) provides grant funding to public sector organisations to support energy efficiency upgrades and low-carbon heating measures.
- The scheme has progressed through multiple phases:
- **Phase 1 (2020-2022)**: Provided £1 billion in grants as part of the government's economic recovery plan following COVID-19. It aimed to support up to 30,000 jobs and reduce public sector carbon emissions through a mix of energy efficiency and heat decarbonisation measures.
- **Phase 2 (2021-2022)**: Allocated £75 million with a stronger emphasis on heat decarbonisation, encouraging a 'whole building' approach to retrofit projects.
- **Phase 3 (2022-2026)**: Committed over £1.425 billion in funding across multiple application windows:
    - *Phase 3a* closed in November 2021.
    - *Phase 3b* closed in November 2022.
    - *Phase 3c* closed in November 2023.
- Phase 3 prioritised the replacement of fossil fuel heating systems with low-carbon alternatives, such as heat pumps and district heating, alongside measures like insulation, solar panels, and heating controls.
- **Phase 4 (2025-2026)** has been announced, continuing support for the decarbonisation of public sector buildings, with a strong emphasis on reducing reliance on fossil fuels and improving energy efficiency.

1.2.2 Future Homes and Buildings Standard

The Future Homes and Buildings Standard, set to be implemented in 2025, aims to advance the UK towards net zero by enhancing energy efficiency and transitioning to cleaner heat sources. During its consultation phase in 2021, the standard (Ministry of Housing; Communities and Local Government, 2021) proposed updates to Part L (Conservation of Fuel and Power) and Part F (Ventilation) standards for both non-domestic buildings and dwellings. Additionally, it includes measures to mitigate overheating risks in new residential buildings. The proposed building improvements include improving fabric and services, introducing low-carbon heat, integrating heat recovery technologies and on-site energy generation.

The standard aims to achieve a significant reduction in carbon emissions per building, targeting an improvement of 22-27% compared to the current Part L 2013 standard. This will be accomplished through enhanced building fabric, improved efficiency of building services, and the adoption of low-carbon technologies such as heat pumps and photovoltaic panels (Ministry of Housing; Communities and Local Government, 2021, p. 30). Given that the grid will decarbonise over time and carbon emissions are not a direct measure of energy efficiency, the standard introduces additional performance metrics for new buildings (Ministry of Housing; Communities and Local Government, 2021): primary energy target, CO_2 emission target and minimum standards for fabric and fixed building services.

The Future Homes Standard consultation, launched in 2019 by the Ministry of Housing, Communities, and Local Government, focused on energy standards for newly built domestic buildings. The Future Buildings Standard consultation in 2021 expanded on this by proposing additional changes to Part L for new domestic buildings. These proposals include:

- Setting the level for the Fabric Energy Efficiency Standard (FEES).
- Updating minimum standards for building services.
- Providing guidance on airtightness testing.

Part L 2021 is expected to emphasise a fabric-first approach and serve as a transition to the Future Homes Standard in 2025, with key measures including low-carbon heating systems and improved building fabric. The new standard targets a 31% uplift in energy efficiency for new homes as outlined in the Future Homes Standard consultation, or a FEES adjustment using a 1.15 multiplier (Ministry of Housing; Communities and Local Government, 2021, p. 112). Part L 2021 includes several updates:

- Increasing minimum standards for new and replacement thermal elements (e.g., walls, floors, roofs) and controlled fittings (e.g., windows, rooflights, doors).
- Raising minimum standards for renovated thermal elements.
- Updating minimum standards for building services, including the requirement for self-regulating devices when replacing heating appliances, and incorporating standards from the Building Services Compliance Guides into Approved Document L, volume 1: dwellings.
- Providing guidance on calibrating devices for airtightness testing.

The Future Homes Standard consultation also sets energy efficiency standards for new and replacement parts of existing buildings, aiming to improve the energy efficiency of the existing housing stock. These standards apply when:

- Adding a new element to an existing building (e.g., an extension).
- Replacing a controlled fitting (e.g., windows, doors).
- Completely removing and replacing a thermal element (e.g., walls, floors, roofs).

In addition to improving building fabric energy efficiency, the Future Homes Standard consultation introduces measures to mitigate overheating risks, a relatively new concept in UK regulations. While Part L 2010 addressed overheating, it lacked specific guidance. The proposed requirements focus on limiting solar gains and ensuring adequate ventilation to remove excess heat, though some recommendations may depend on occupant behaviour (e.g., keeping windows open in unoccupied rooms). Guidance on limiting solar gains in summer is provided in Approved Document L1A, Criterion 3, and in Approved Document L, volume 1: conservation of fuel and power in dwellings, sections 4.9 and 4.10.

Following the 2021 consultation, another consultation was initiated in 2023 to cover Part L, Part F and Part O (overheating). This consultation closed in March 2024 and its findings are yet to be released. However, stakeholders such as LETI (section **Error! Reference source not found.**) have r aised concerns about ‘how far’ the standards go. In particular, they note:

- Developers can ‘opt-out of achieving minimum Part L requirements
- Continued use of Carbon emissions and primary energy metrics
- Avoidance of accounting for unregulated energy
- Utilisation of a notational building methodology

Table 3: Summary of limit values of building envelope thermal transmittance (U-values) and air permeability in existing and future standards (Ministry of Housing; Communities and Local Government, 2021, p. 43, 106, 111-113)

	Standards for new thermal elements, windows, doors for existing non-domestic buildings		Standards for new thermal elements, windows, doors for existing dwellings		Upgrading retained thermal elements in existing dwellings		Part L 2021 (HM Government, 2021b)	Part L2021 notional building
	2013	Proposed	Current standard	Proposed Standard	Current standard	Proposed Standard	Current standard	Proposed Standard
U-values	0.16	0.16	0.16	0.16	0.35	0.16	0.16	0.11

Pitched roof – insulation at ceiling level (W/m^2K)								
U-values Pitched roof – insulation at rafter level (W/m^2K)	0.18	0.16	0.18	0.15	0.35	0.16	0.16	0.11
U-values Flat roof or roof with integral insulation (W/m^2K)	0.18	0.18	0.18	0.15	0.35	0.16	0.16	0.11
U-values Wall (W/m^2K)	0.28	0.26	0.28	0.18	0.70 for cavity insulation & ext./int. wall insulation	0.55 for cavity insulation 0.30 ext./int. wall insulation	0.26	0.18
U-values Floors (W/m^2K)	0.22	0.18	0.22	0.18	0.70	0.25	0.18	0.13
U-values Windows (W/m^2K)	1.6 Window Energy Rating Band C	1.6 Window Energy Rating Band B	1.6 Window Energy Rating Band C	1.4 Window Energy Rating Band B	-	-	1.60	1.2
U-values Doors (W/m^2K)							1.60	1.0
Air permeability (m^3/hm^2 @50 Pa)							8.0	5.0

1.2.3 Passive House Standard and EnerPHit

EnerPHit is an energy-efficient building retrofit certified under the Passive House (PH) standard, offering more flexible energy, and building envelope targets compared to new PH constructions. It adheres to Passive House principles, emphasising a highly efficient and well-insulated building envelope, enhanced airtightness, minimised thermal bridging, mechanical ventilation with heat recovery, efficient heat generation, and utilisation of renewable energy sources (Passipedia, 2018).

Achieving EnerPHit certification can be pursued through either the building component method or the energy demand method (PHI, 2016). For the UK's cool-temperate climate, the building component method imposes maximum U-values of 0.15 W/m^2K for the building envelope, with walls

permitted up to 0.35 W/m²K U-values when accounting for internal insulation, considering its impact on usable floor area (PHI, 2016). Also, window installations must not exceed a maximum U-value of 0.85 W/m²K. Alternatively, the energy demand method necessitates a maximum heating demand of 25 kWh/m²a (PHI, 2016).

Regardless of the chosen method, EnerPHit requires adherence to an airtightness limit of 1 air change per hour at 50 Pascal (PHI, 2016) and specific PER (Primary Energy Renewable) demands of ≤ 71 for cool temperate regions or ≤ 65.5 for warm temperate areas (PHI, 2016). Variances in values and targets from standard EnerPHit criteria may be acceptable in certain retrofit areas, provided they are offset by enhanced thermal protection in other areas of the project.

1.2.4 London Energy Transformation Initiative (LETI)

(LETI, 2020) is an independent organisation and network comprising over 1000 professionals in the built environment sector, advocating for energy efficiency and net zero. They focus on energy performance and set targets for building envelope and energy systems to achieve zero carbon. (LETI, 2020) employs the Energy Use Intensity (EUI) metric for new buildings to gauge performance solely based on actual in-use energy consumption, rather than carbon emissions which can be influenced by the carbon intensity of the grid.

For homes, similar to those reviewed as part of this project, LETI recommends a series of design measures and minimum standards for fabric and energy performance, aiming for an EUI equivalent of 35 kWh/m² (LETI, 2020). By comparison, the current average EUI under Part L is estimated to be 140 kWh/m²a (LETI, 2020),highlighting the need for a substantial 75% reduction in energy usage. A summary of the proposed guidance is shown in Table 4.

Table 4: Recommendation on design, building fabric and energy performance according to LETI (2020, p. 26-27)

Metric	Specification	Target
Building fabric U-values	Walls	0.13-0.15 W/m^{2}K
	Floor	0.08-0.10 W/m^{2}K
	Roof	0.10-0.12 W/m^{2}K
	Exposed ceilings/floors	0.13-0.18 W/m^{2}K
	Windows	0.80 W/m^{2}K, triple glazing
	Doors	1.00 W/m^{2}K
Airtightness	Building	< 1 m^3/h. m^2@50Pa
Energy Use Intensity (EUI)	Building (gross area)	35 kWh/m^2.a
Heating demand	Building	15 kWh/m^2.a
Window-to-Wall Ratio (WWR)	North	10-15%
	East	10-15%
	South	20-25%
	West	10-15%
Form factor	Building	1.7 – 2.5
Thermal bridging	y-value	0.04
G-value	Glazing	0.6-0.5
MVHR	Ventilation	90% efficiency, duct length from unit to external wall ≤ 2m
Embodied carbon	Material, transport, construction, maintenance, end of life disposal (gross area)	< 500 KgCO$_2$/m^2
Heating system	Building	10 W/m^2 peak load, fossil fuel free
Hot water system	Building	Maximum dead leg of 1 litre for hot water pipework, fossil fuel free
Renewable energy generation	Building	100% of the energy demand
Energy storage	Building	Consider battery storage to smooth energy demand

1.3 Existing Carbon Reporting Data

In the UK, existing carbon reporting data includes comprehensive information on greenhouse gas emissions from various sectors including the built environment sector. This data is crucial for monitoring progress towards meeting carbon reduction goals, informing policy decisions and promoting transparency in sustainability efforts. In the built environment sector, the metric used in determining if buildings meet their specific target is a critical component on the delivery of the retrofit. Next, the key elements that are currently considered have been highlighted.

- Energy performance is considered a core metric, as it can be readily estimated at the design stage and very easily monitored in-use as energy bills are based on kWh of energy used by the building (LETI, 2020) me retrofit housing studies that have used heating demand as the main metric to show improvements. Most of these studies considered heating demands of between 25-50 kWh/m^{2}a (e.g. EnerPHit standard and LETI). However, it is noted that these projects calculated the area of the heated floor in many ways - this can impact the assumed target.
- A review of current upgrades of retained thermal elements in existing dwellings seem to follow values similar as those suggested by the Future Homes Standard around 0.16 W/m^{2}K with more flexible values to floors and cavity walls.

- Thermal bridges are identified as areas of focus as their impacts are maximised in highly insulated buildings.
- Airtightness plays a key role on delivering the energy targets. Low levels of airtightness can be achieved when combined with MVHR and this is recommended as the best way forward by the EnerPHit standard (PHI, 2016). MVHR can greatly contribute to reducing energy heating demand, resulting in domestic hot water (DHW) being the most significant demand in the building.

1.4 Fabric-First

Fabric-first is referenced in the UK Net Zero Strategy: Build Back Greener (Department for Business, Energy & Industrial Strategy (BEIS), 2021) and the Retrofit for the Future Guide (Technology Strategy Board, 2014). With a fabric-first approach, building fabric improvement measures are made first, before active retrofit measures are considered.

The Energy Saving Trust recommend that homes should be heated to temperatures between 18-21°C during winter (EST, 2021). Considering Low Temperature Hot Water (LTHW) supply temperatures, Approved Document G (Sanitation, hot water safety and water efficiency) recommends that delivered temperatures should not exceed 48°C (Government, 2015).

Heat pumps are typically able to generate LTHW at temperatures of between 35-55°C. Heat pumps achieve highest efficiencies when the required flow temperature is lower, since the system needs to do less 'work' to generate heat. According to the Carbon Trust, *'every 1°C reduction in flow temperature typically results in approximately 1.5%-3% increase in heat pump efficiency'*. Figure 1 is taken from a report into 'Low Carbon Heat: Heat Pumps in London,' commissioned by the Greater London Authority.

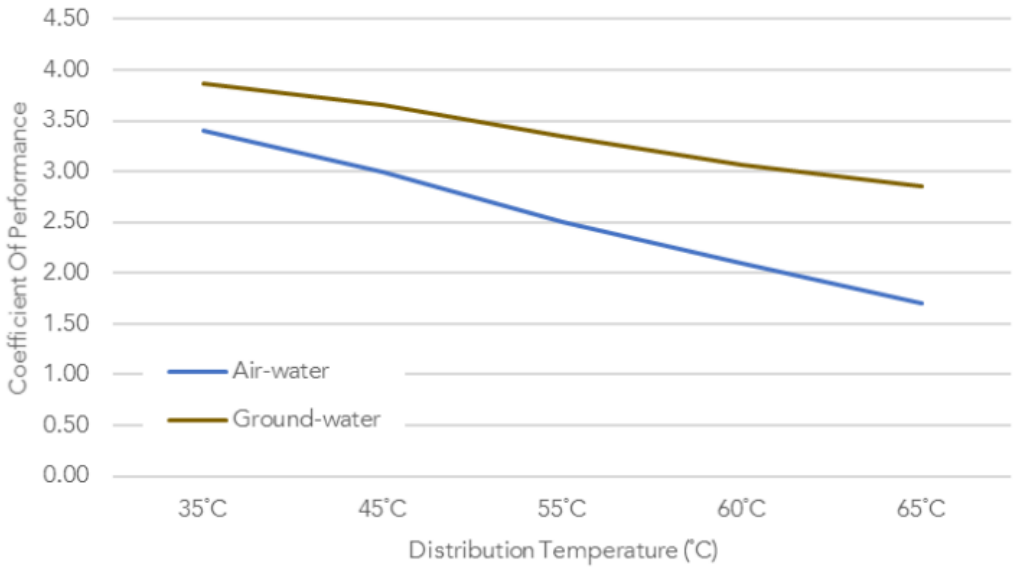


Figure 1: Relationship between flow temperature and heat pump efficiency (GLA, 2018)

Comparatively, gas fired boilers are typically designed to deliver LTHW at temperatures of between 65-75°C (Ducker, 2022). For this reason, with gas fired boilers, it is possible to turn up the heating to high levels for short periods of time. This results in surges in temperature which are often reactive, according to user preference. Gas fired boilers are also able to deliver hot water to radiators at consistently high temperatures for prolonged periods of time. This means that it is possible to heat a room or home with a relatively low number of radiators. The high output temperatures also mean that gas boilers can counteract any heat losses associated with poor performing buildings.

A heat pump produces heat more slowly than a boiler. They are not typically suited to reactive user profiles and are designed to deliver smaller temperature differences at consistent levels. The Carbon Trust state that heat pumps perform most efficiently *'when maintaining a constant temperature in continuous operation'* (Trust, 2020). It is for this reason that underfloor heating solutions work well with heat pumps, where large surface areas mean that lower temperatures can be used to heat more of the building footprint. The radiators used with heat pump systems are also typically larger.

A fabric-first approach will result in immediate reductions in energy demand (regardless of the heat source) and will ensure that the new heating systems installed later perform optimally. There are also other benefits in terms of internal comfort and occupant health. According to the Construction Leadership Council (CLC), a fabric-first approach *'is a 'no regrets one'; reducing the demand for heat, improving the ability to heat the poorest performing homes whilst allowing more time to consider the methods available to heat those homes as the decarbonisation of the electricity supply grid continues. This satisfies fuel poverty eradication as well as net zero carbon emissions'* (CLC, 2016).

Considering energy capacity and security, LETI highlight that at peak demand in winter, the UK's energy requirement is around three times the capacity of the national electricity grid (LETI, 2020). The Greater London Authority (GLA) found that electrification of heat in buildings would require a sharp increase in energy efficiency and concluded that without this, there would be major increases in peak demand necessitating expensive network upgrades through taxpayer funding (GLA, 2018). As well as avoiding unnecessary national spending, reductions in national energy demand through fabric-first principles will aid *'energy security and make us more resilient to global energy shocks*' (Khayatt, 2021).

1.5 Net Zero Readiness

For a property to be 'Net Zero ready', electricity must be the sole source of power for all heating and other energy requirements. This way – regardless of the quantity of electricity consumption – when the national electricity grid eventually becomes fully renewable, the property will produce zero carbon emissions to operate. Clearly, the amount of electricity that the property uses will impact the annual energy bills for the user. This is one of the reasons that 'Fabric-First' is considered best practice, as discussed in detail in Section 1.4.

For the purposes of this Section, it is important to consider the benefit of implementing Fabric First principles, compared to installing electric heating systems with limited fabric upgrades. Some key factors are summarised in Table 5.

Table 5: The pros and cons of implementing Fabric First principles, compared to installing electric heating systems with limited fabric upgrades.

Pros	Cons
■ Boiler Upgrade Scheme (funding for ASHP and GSHP) requires a valid EPC with no outstanding recommendations for loft or cavity wall insulation. ■ Energy bills do not increase significantly as a result of heating system electrification. ■ Climate change benefits prior to electricity grid decarbonisation. ■ Reduction in the risk of fuel poverty. ■ Reduction in adverse health impacts of poorly insulated homes.	■ Increased cost of fabric-first strategies. ■ Energy bills will increase due to the cost of electricity compared to gas, if energy demand is not reduced. ■ BUS funding cannot be applied for if limited fabric improvement measures have not been implemented (cavity wall and loft insulation) ■ Increased programme duration and disruption levels for occupants. ■ Risk of unintended consequences (moisture issues) associated with

▪ Macro-economic benefits of reduced taxpayer spending on NHS and national grid upgrades. ▪ Increased demand for local skilled labour and specialist retrofit advice, driving positive economic growth. ▪ Appreciation in property value associated with improved EPC Rating and energy performance. ▪ Compliance with upcoming changes to the Minimum Energy Efficiency – landlord benefit.	insulation, if best practice is not followed. ▪ Lack of training and skilled workforce to meet the high demand. ▪ Practical issues associated with 'hard-to-treat' properties, including heritage, ownership, and statutory issues.

1.6 External Wall Insulation: Best Practice

In domestic retrofit terms, External Wall Insulation (EWI) is generally considered to be best practice and is preferred over Internal Wall Insulation (IWI) for several key reasons:

- **Thermal Bridging:** EWI effectively minimises thermal bridging by enveloping the building's exterior, ensuring continuous insulation. In contrast, IWI can leave structural elements like floor joists and internal walls exposed, creating potential thermal bridges. The Building Research Establishment (BRE) notes that *'the most common form of solid wall insulation in the UK is applied externally, as it is less disruptive to the residents and technically less challenging when compared to internal wall insulation'* (BRE, 2016).
- **Moisture Risk:** Applying insulation internally can alter the building's moisture balance, potentially leading to condensation and damp issues if not properly managed. The UK Centre for Moisture in Buildings highlights that *'the unintended consequences of insulating internally are poorly understood, however, and a tendency to regard the installation of internal wall insulation (IWI) as akin to wallpapering can result in defects'* (NBT, 2017).
- **Disruption:** Installing EWI causes minimal disturbance to occupants, as the work is conducted externally. Conversely, IWI requires significant interior work, often necessitating the removal of fixtures and fittings, leading to considerable disruption. The BRE emphasises that EWI is *'less disruptive to the residents and technically less challenging when compared to internal wall insulation'* (BRE, 2016).
- **Cost:** While EWI can be more expensive due to materials and scaffolding requirements, it often provides better long-term value by addressing multiple issues simultaneously, such as thermal performance and moisture control. IWI might have lower upfront costs but can lead to additional expenses if moisture-related problems arise.

It should be noted that even retrofit schemes which utilise EWI can result in unintended consequences, if the proper steps are not taken. The Retrofit Academy, within their publication 'PAS 2035: What is it and what does it mean for you', highlight that defects and unintended consequences are common within poorly delivered retrofit projects. Located in Preston, the 'Fishwick 247 External Wall Insulation Project' is an infamous example of poor-quality retrofit. Delivered in 2013, the scope was to install external wall insulation to 386 terraced dwellings. Fishwick is an inner-city Ward within Preston City Council (PCC), characterised by poor quality 19th century housing. The scheme was delivered under the now discontinued government funding scheme CESP. Within one year of completion, a large proportion of the properties started to report quality issues *"mainly about dampness, mould growth and water penetration"* (PCC, 2022).

Fundamentally, the quality of the housing stock within the Fishwick Ward was very poor prior to commencement of the works. There were existing building defects including poor quality brickwork, defective rainwater goods, and rotting external doors and windows. PCC highlight that these issues

were not acknowledged or addressed as part of the retrofit project. Additionally, works were rushed to meet funding deadlines, and the quality of workmanship was poor. Properties were not assessed on an individual basis and a 'one size fits all' approach was taken. The poor-quality work resulted in unintended consequences in most homes, including adverse impacts on health, wellbeing and quality of living. Additionally, the energy performance levels, and associated energy bill reductions are not in line with predictions.

It is vital that Broxtowe Borough Council take the necessary steps to avoid unintended consequences. Within this technical report, External Wall Insulation is recommended, in accordance with best practice.

1.7 BSI Publicly Available Specification (PAS) 2035

During the early 2010's, the Building Research Establishment (BRE) and subsequently BEIS recognised that many retrofit projects were failing. In response to this, BEIS released 'An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy', in coordination with the Department for Communities and Local Government (BEIS, An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy, 2016). The document, released in 2016, was titled 'Each Home Counts' and made 27 key recommendations as to how the industry can better support customers within the energy efficiency sector. Recommendations 1 and 8 are particularly relevant to this report.

Recommendation 1 states that every project should be delivered under a quality mark. This was subsequently agreed to be TrustMark, who are a *'Government Endorsed'* consumer protection scheme (TrustMark, 2022). Recommendation 2 called for a new framework for the construction industry, relating specifically to energy improvement works. In response to this recommendation, the British Standards Institute (BSI) were commissioned to develop and publish a document called the 'BSI Publicly Available Specification (PAS) 2035', or 'PAS 2035' (BSI, 2019). This is an overarching framework for project delivery and it *'addresses the fundamental structural problems that blight many energy efficiency projects'* (Academy, 2019).

For developers and clients that require project delivery under TrustMark, full compliance with the PAS 2035 framework is required. The framework introduces five clear roles to the retrofit process and breaks down each project into six distinct phases, all of which are overseen by the Retrofit Coordinator. The Retrofit Coordinator, one of the five roles, is ultimately responsible for ensuring compliance with PAS 2035 (Academy, 2019). A graphical representation of the *'core principles of PAS 2035'* is provided at Figure 2.

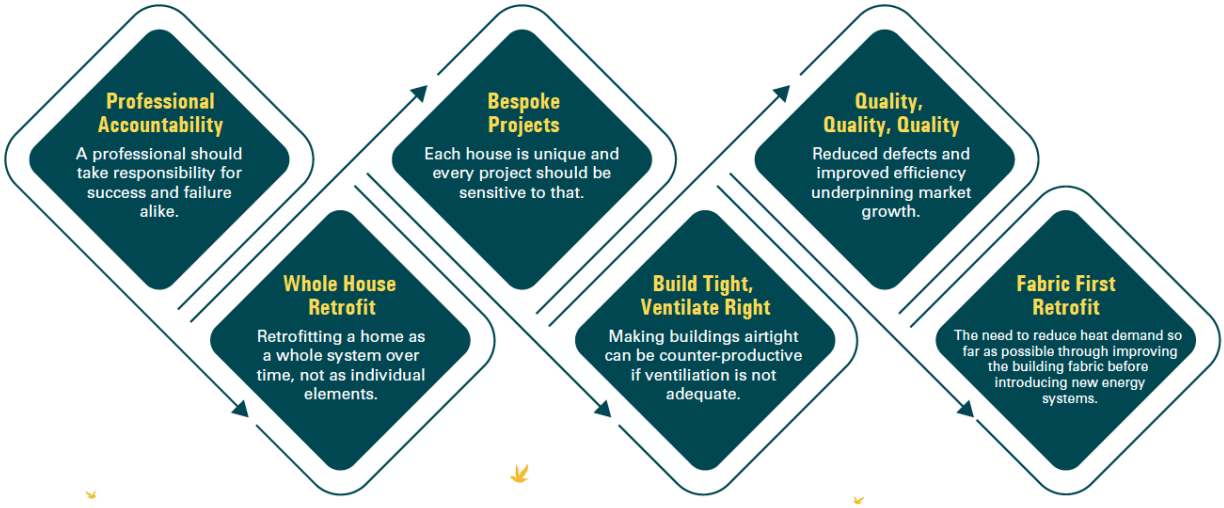


Figure 2: Core principles of PAS 2035 (Academy, 2019)

Whilst retrofit delivery under the TrustMark scheme is voluntary in the UK, there are government funding opportunities that require a commitment to compliance as a prerequisite to funding success. Within this report, it is assumed that PAS2035 principles for best practice are followed by Broxtowe Borough Council.

1.8 Broxtowe Housing Stock Characterisation: Energy Performance Certificate

This section summarises the current condition of Broxtowe's housing stock (including owner-occupied, privately rented and socially rented), based on the Energy Performance Certificate (EPC) database (Department for Levelling Up, Housing & Communities, 2024). The purpose of this section is to identify archetypes that represent the Broxtowe housing stock, ensuring that subsequent building simulations are relevant. To do this, consideration must be given to various property characteristics, including EPCs, Standard Assessment Procedure (SAP) score (which is used to determine EPC bands), property type, building form, construction age, tenure status and the energy efficiency of specific building fabrics (e.g., walls, roof, floors etc.). Unless stated otherwise, all of the information in this section was derived from the EPC database.

Energy Performance: As of April 2024, there are 36,933 unique lodged EPCs in Broxtowe. Of these, 33.8% have an EPC rating of A–C, while the remaining 66.2% are rated D–G. An EPC rating of C is a generally accepted benchmark for energy efficiency. Table 6 shows the total distribution of EPC ratings in Broxtowe; the majority of properties are rated C or D (~68%), which is broadly consistent with the rest of England. EPC banding can be useful for basic comparisons of energy efficiency, but the banding process induces a potentially misleading level of aggregation, for example, there may be a considerable number of D-rated properties that are on the verge of being C-rated or vice-versa.

Table 6: EPC distribution across all Broxtowe homes (n=36,933) (% in parentheses)

EPC	A	B	C	D	E	F	G
Frequency	45 (0.12)	3025 (8.19)	9421 (25.50)	15878 (42.99)	6810 (18.43)	1488 (4.03)	266 (0.72)

To overcome this, Figure 3 shows the distribution of SAP scores (a continuous scale that determines EPC rating) in Broxtowe, disaggregated by the four main property types: bungalows, flats, houses and maisonettes. This allows a more accurate identification of the property types that are most in need of energy efficiency upgrades. SAP scores over 69 correspond to an EPC rating of C or above. Across all homes in Broxtowe the mean SAP score is 62.5 and the median is 64; the median score is probably more informative in this context, as the mean can be overly sensitive to outliers. The figure shows that flats and maisonettes are the most energy efficient property types, with median SAP scores of 72 and 70, respectively. Conversely, houses and bungalows are the least efficient, both with median SAP scores of 62.

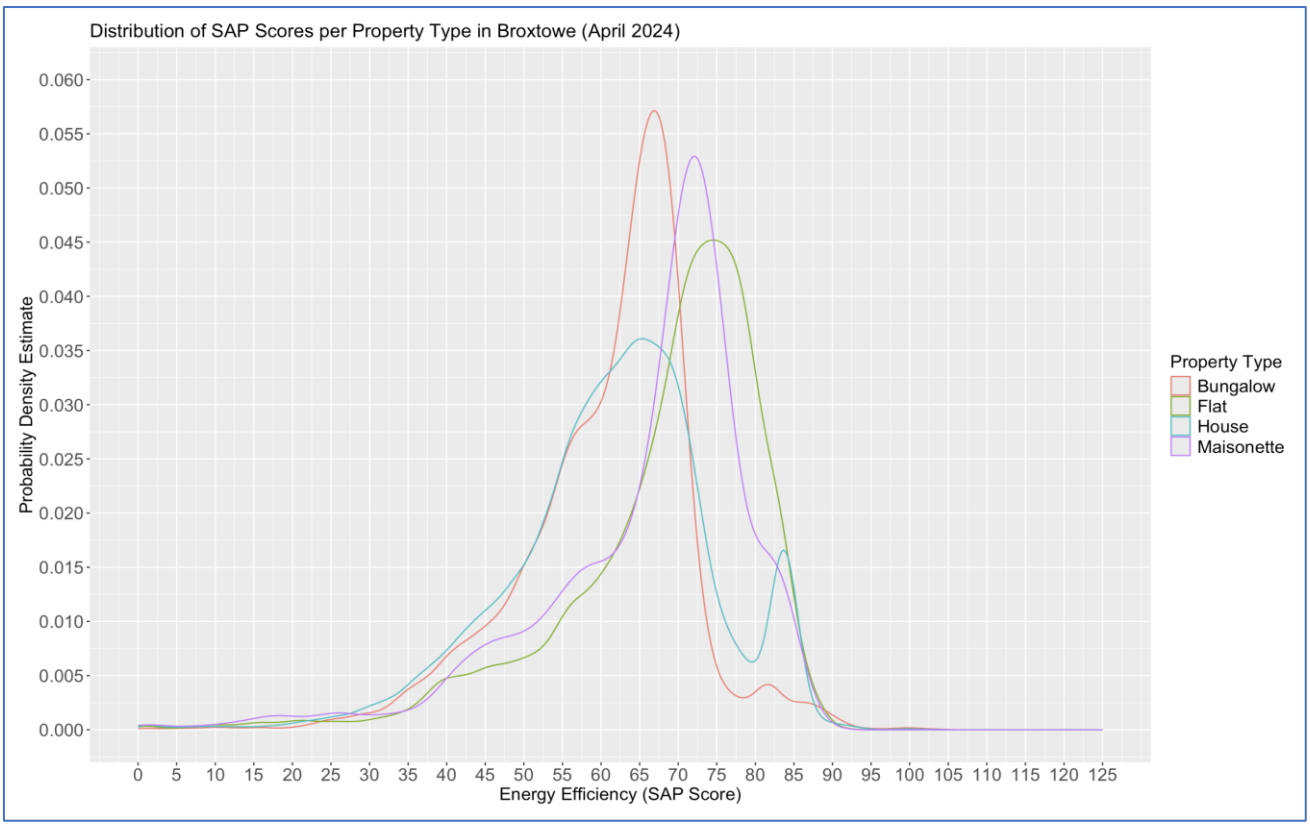


Figure 3: Distribution of SAP scores for all Broxtowe homes, disaggregated by property type (dashed lines = median SAP per property type) (n=36,933)

Construction Age: The construction age of homes often plays a significant role in determining their form, build fabrics and energy efficiency. Figure 4 shows the construction age bands of all homes in Broxtowe, disaggregated by EPC (A–C versus D–G). As expected, homes built before and in the first half of the 20th century are less energy efficient than those built more recently. The irregularity of the x-axis should be noted; the construction age bands are released in this format, so it is not possible to create regular intervals (e.g., builds per decade).

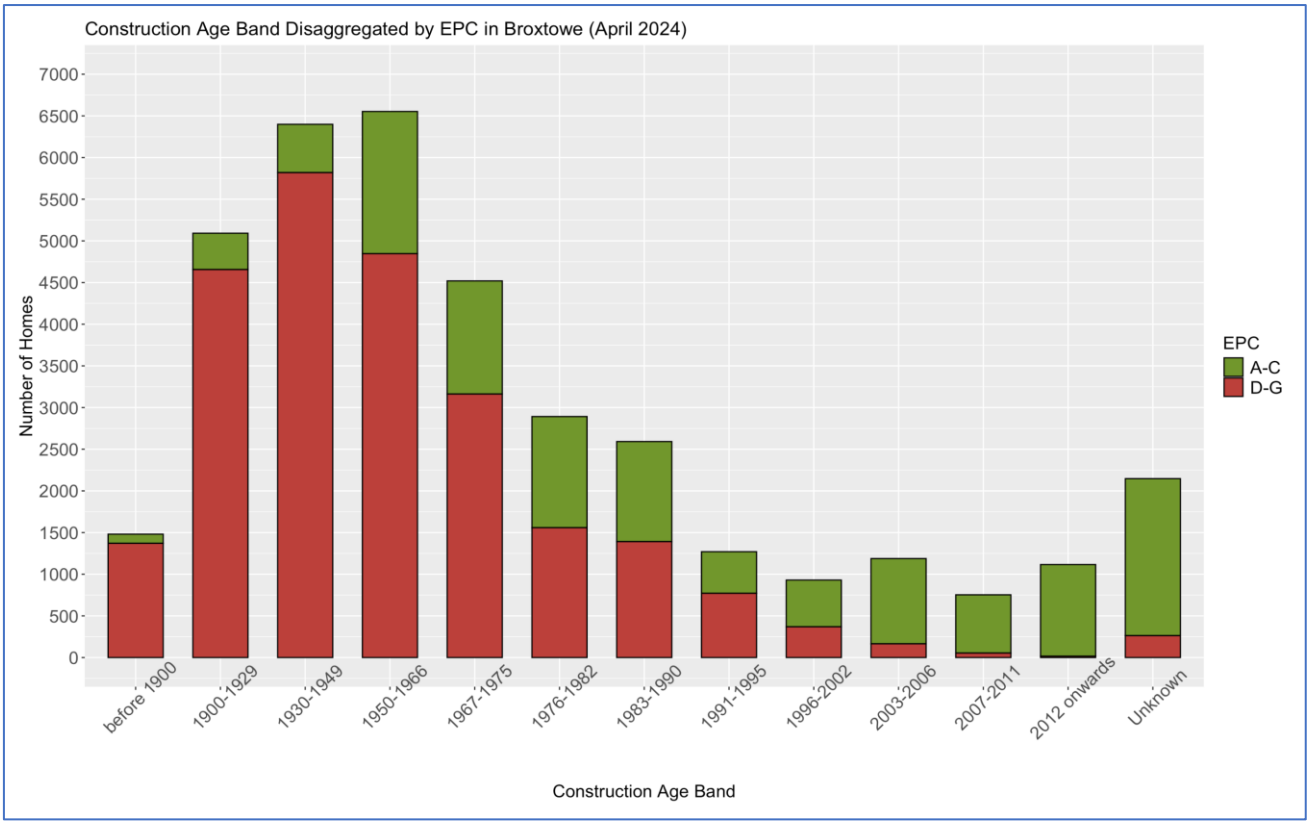


Figure 4: Construction age band for all Broxtowe homes, disaggregated by EPC (n=36,933)

Tenure Status: The tenure status of homes is a crucial factor that can affect the practicalities of retrofitting strategies. In many British cities, including Nottingham, the energy efficiency of socially rented properties tends to be higher than privately rented and owner-occupied homes. This may be due to hesitation among homeowners to see the short or long-term benefits of retrofitting. In Broxtowe, the division of tenure is as follows: 58.35% of homes are owner-occupied, 19.08% are privately rented, 13.96% are socially rented and the remaining 8.20% are unknown. Table 7 shows the proportion of homes within each tenure status that achieve an EPC rating of A–C, as well as the median SAP score. As expected, the energy efficiency of socially rented homes tends to be higher, whereas there is less to separate owner-occupied and privately rented properties.

Table 7: Tenure Status, EPC and SAP in Broxtowe (n=36,933) (% EPC A–C versus D–G within tenure status in parentheses)

Tenure Status	EPC A–C	EPC D–G	Median SAP
Owner-occupied (n=21549)	5070 (23.53)	16479 (76.47)	61
Privately rented (n=7048)	1865 (26.46)	5183 (73.54)	62
Socially rented (n=5157)	2977 (57.73)	2180 (42.27)	70

Property Type & Building Form: Table 8 displays a cross-tabulation of property type and building form in Broxtowe (for the 36,509 properties where this information is available). Houses are the most common property type, accounting for 72.26% of all homes. Flats are the second most common property type (14.78% of all homes). Detached bungalows also account for a considerable proportion of homes (8.26%). In total, houses, flats, and detached bungalows account for around 95% of Broxtowe properties, therefore, the remaining statistics in this section will focus on these home types only.

Table 8: Property type versus building form in Broxtowe (n=36,509) (% in parentheses)

	Detached	Semi-detached	Mid-Terrace	End-Terrace	Total
Bungalow	3016 (8.26)	733 (2.01)	162 (0.44)	168 (0.46)	4079 (11.17)
House	7607 (20.84)	11105 (30.42)	4559 (12.49)	3111 (8.52)	26382 (72.26)
Flat	NA	NA	NA	NA	5395 (14.61)
Maisonette	119 (0.33)	270 (0.74)	127 (0.35)	128 (0.35)	644 (1.76)
Park home	9 (0.02)	NA	NA	NA	9 (0.02)
Total	11795 (31.94)	14184 (38.40)	6172 (16.71)	4358 (11.80)	**36509**

Table 8 also shows the most common building forms for each property type. The four most common property-build combinations are as follows: semi-detached houses (30.42% of all properties); detached houses (20.84%); mid-terrace houses (12.49%), end-terrace houses (8.52%). Note that, although the EPC database does provide information on building form for flats, we do not believe this information to be sufficiently accurate, therefore, we treat flats as a singular build category in this section. In spite of this, retrofitting simulations are provided for mid-terrace and end-terrace flats in later sections.

Property types of interest (houses, flats & detached bungalows) in Broxtowe: Further to houses being the most common property type, Table 9 also showed them to be the least efficient. Table 9, instead, shows energy efficiency characteristics for the property types of interest, disaggregated by building form, allowing us to determine the specific property-build combinations that lead to lower SAP scores. Table 9 shows that all build categories among houses (detached, semi-detached, mid-terrace and end-terrace) are less energy efficient than flats, however, detached bungalows are approximately as inefficient as detached/semi-detached houses. Among houses, detached and semi-detached are both the most numerous and some of the least energy efficient properties in Broxtowe.

Table 9: Further energy efficiency characteristics for houses and flats, disaggregated by building form (n=37,183) (% EPC A–C versus D–G within property-build type in parentheses)

Property type	Building form	EPC A–C	EPC D–G	Median SAP
Houses (n=26382)	*Detached*	2261 (29.72)	5356 (70.28)	62
	Semi-detached	2627 (23.66)	8478 (76.34)	61
	Mid-terrace	1669 (36.61)	2890 (63.39)	65
	End-terrace	1042 (33.49)	2069 (66.51)	63
Flats (n=5395)	*All flats*	3355 (62.19)	2040 (37.81)	72
Bungalows (n=3016)	*Detached*	534 (17.71)	2482 (82.29)	62

Figure 5, Figure 6 and Figure 7 show the distribution of construction age bands for inefficient (i.e., a subset of D–G rated properties only) houses, flats and bungalows, respectively. As before, houses are disaggregated by building form, while flats are treated as a singular build category.

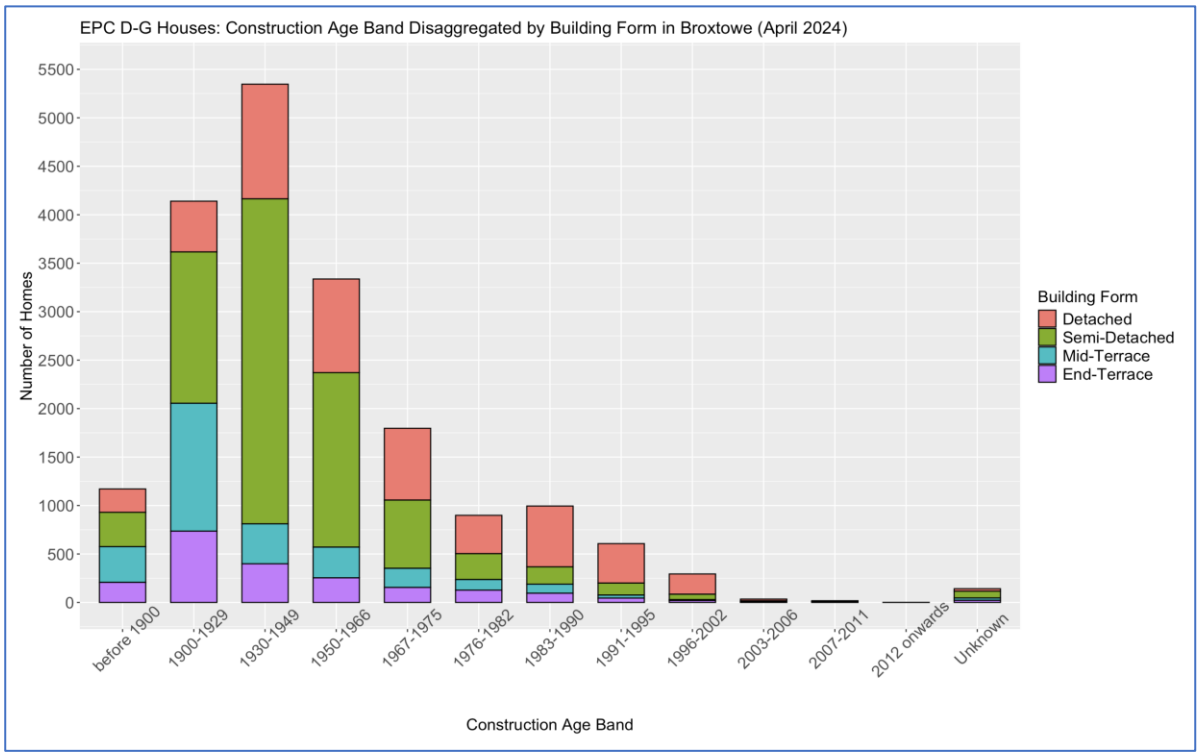


Figure 5: Construction age band for EPC D–G rated houses in Broxtowe, disaggregated by building form (n=18,783)

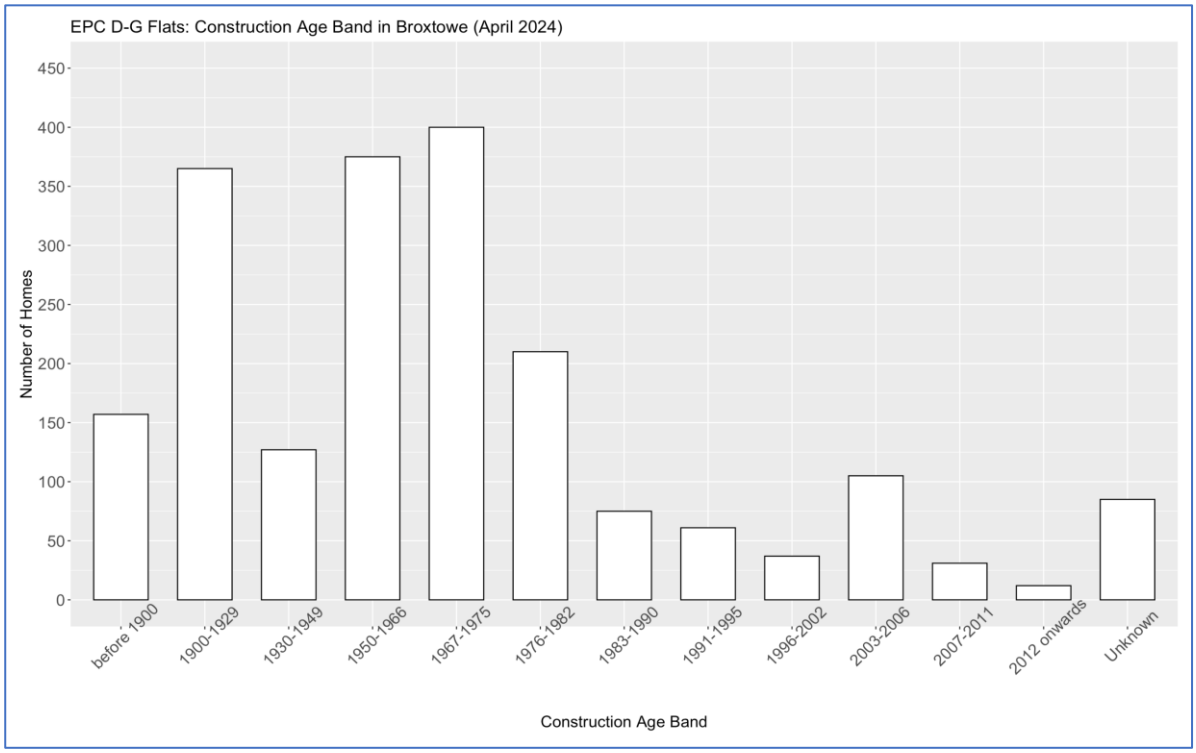


Figure 6: Construction age band for EPC D–G rated flats in Broxtowe (n=2,040)

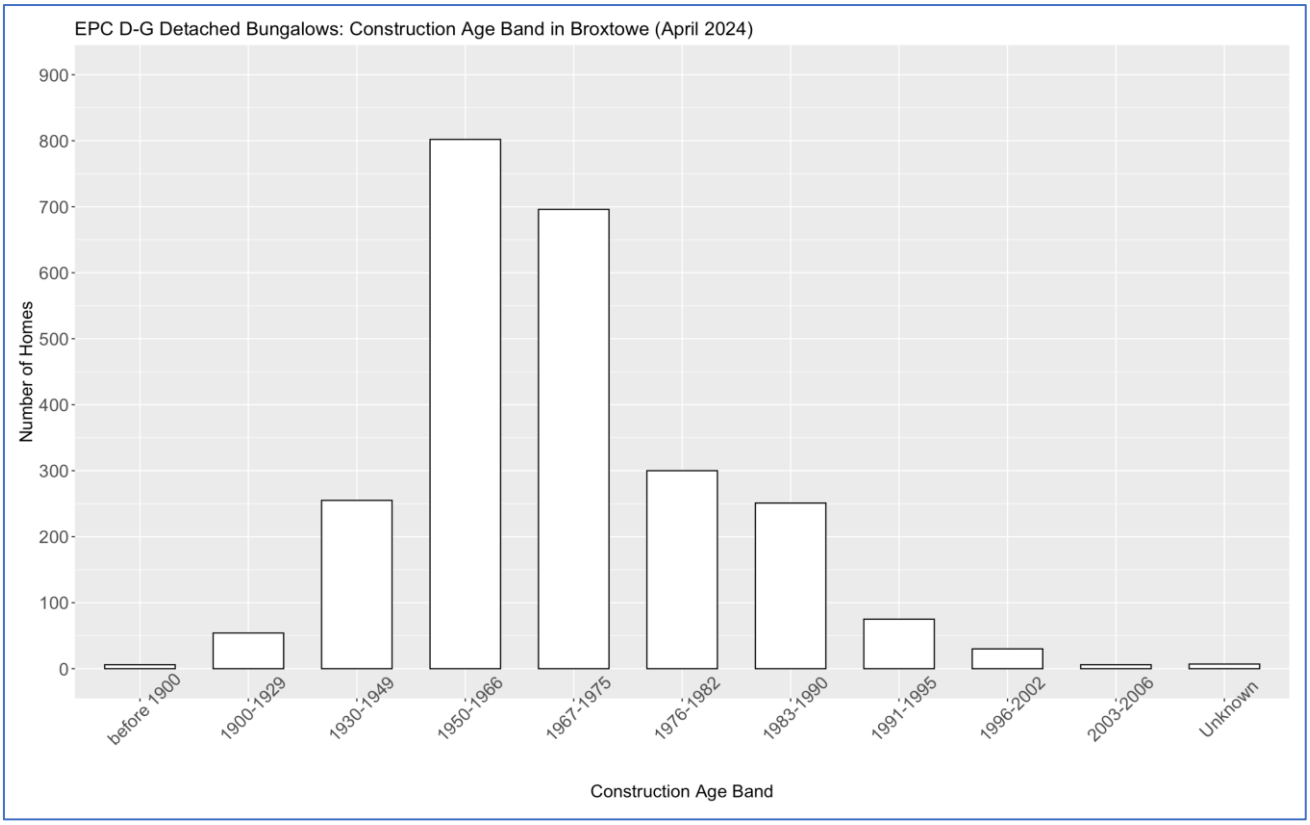


Figure 7: Construction age band for EPC D–G rated detached bungalows in Broxtowe (n=2,482)

Given the information up until this point, suitable archetypal properties in Broxtowe may be any of the following: (i) detached or semi-detached houses built from 1900 to the late 1960s; (ii) flats built from the 1950s to the 1980s; and (iii) detached bungalows built from the 1950s to the 1980s. It may be particularly productive to target privately rented and owner-occupied properties among these categories.

Property dimensions (amongst archetypes): For the property types of interest, it is important to understand typical dimensions, namely the number of habitable rooms and floor area, to enhance the accuracy of the simulations. Table 10 shows the median and mean number of habitable rooms, as well as the median floor area, per property-build type.

Table 10: Number of habitable rooms and median floor area per property-build combination

Property type	Building form	Median (mean) habitable rooms	Median (mean) floor area (m^2)
Houses (n=26382)	*Detached*	6 (5.84)	111 (122.80)
	Semi-detached	5 (4.71)	84 (87.75)
	Mid-terrace	4 (4.26)	76 (78.13)
	End-terrace	4 (4.31)	77 (79.36)
Flats (n=5395)	*All flats*	3 (2.63)	51 (53.85)
Bungalows (n=3016)	*Detached*	4 (4.14)	76 (84.43)

Heating type: The main heating type used within the home has implications for the property's energy efficiency rating, energy costs and the thermal comfort of occupants. In Broxtowe, as is the case in the rest of the UK, the main heating type in the vast majority of homes is a mains gas boiler with radiators. This is the case for more than 88% of properties in Broxtowe, a rate which remains

consistent across the house types of interest; hence, no further disaggregation of heating type per property-build combination is provided here.

Build fabrics (Walls; Roof; Floor; Windows [illustrated in* Appendix A: Building Fabric*]): A breakdown of the most common build fabrics per property type of interest in Broxtowe, for all homes and for the inefficient subset (EPC D–G properties), is presented in Table 11 (walls), Table 12 (roof), Table 13 (floor) and Table 14 (windows). Following this, the most common build fabrics across all Broxtowe homes is presented in Table 15, whereas Table 16 displays the equivalent information for EPC D–G rated homes.

WALLS

Table 11: Wall fabric breakdown

Property-build type	Wall type	Proportion per house type	Proportion per house type (EPC D–G)
All detached houses (n=7,607)	U = 0.13–0.20 W/m2K	1.6%	<0.1%
	U = 0.21–0.30 W/m2K	8.0%	<0.1%
	U = 0.31–0.45 W/m2K	0.2%	<0.1%
EPC D–G detached houses (n=5,356)	U = 0.46–1.80 W/m2K	<0.1%	<0.1%
	Cavity wall, as built – partially/fully insulated*	24.6%	21.8%
	Cavity wall, as built – no insulation*	10.4%	14.4%
	Cavity wall, as built – filled cavity	25.1%	23.6%
	Solid brick, as built – no insulation*	**27.7%**	**38.3%**
	Solid brick – internal/external insulation	1.4`%	1.0%
	System built, as built – no insulation*	<0.1%	0.1%
	System built – internal/external insulation	<0.1%	<0.1%
	Other/unknown	0.9%	0.9%
Semi-detached houses (n=11,105)	U = 0.13–0.20 W/m2K	1.5%	<0.1%
	U = 0.21–0.30 W/m2K	5.2%	<0.1%
	U = 0.31–0.45 W/m2K	0.1%	<0.1%
EPC D–G semi-detached houses (n=8,478)	U = 0.46–1.80 W/m2K	0.3%	0.4%
	Cavity wall, as built – partially/fully insulated*	8.2%	5.8%
	Cavity wall, as built – no insulation*	11.0%	13.8%
	Cavity wall, as built – filled cavity	23.2%	17.7%
	Solid brick, as built – no insulation*	**47.5%**	**60.5%**
	Solid brick – internal/external insulation	1.5%	0.7%
	System built, as built – no insulation*	0.2%	0.3%
	System built – internal/external insulation	<0.1%	<0.1%
	Other/unknown	1.1%	0.8%
Mid-terrace houses (n=4,559)	U = 0.13–0.20 W/m2K	1.8%	<0.1%
	U = 0.21–0.30 W/m2K	3.1%	<0.1%
	U = 0.31–0.45 W/m2K	0.9%	<0.1%
EPC D–G mid-terrace houses (n=2,890)	U = 0.46–1.80 W/m2K	0.1%	0.1%
	Cavity wall, as built – partially/fully insulated*	14.0%	7.3%
	Cavity wall, as built – no insulation*	7.5%	9.0%
	Cavity wall, as built – filled cavity	17.2%	9.4%
	Solid brick, as built – no insulation*	**51.3%**	**71.0%**
	Solid brick – internal/external insulation	2.1%	1.2%
	System built, as built – no insulation*	1.0%	1.1%
	System built – internal/external insulation	0.1%	0.1%
	Other/unknown	1.0%	0.8%
End-terrace houses (n=3,111)	U = 0.13–0.20 W/m2K	2.7%	<0.1%
	U = 0.21–0.30 W/m2K	6.5%	<0.1%
	U = 0.31–0.45 W/m2K	1.2%	<0.1%
EPC D–G end-terrace houses (n=2,069)	U = 0.46–1.80 W/m2K	0.1%	0.2%
	Cavity wall, as built – partially/fully insulated*	17.8%	11.0%
	Cavity wall, as built – no insulation*	5.0%	7.2%
	Cavity wall, as built – filled cavity	19.2%	14.2%
	Solid brick, as built – no insulation*	**41.9%**	**62.3%**

	Solid brick – internal/external insulation	2.7%	2.0%
	System built, as built – no insulation*	1.2%	1.6%
	System built – internal/external insulation	0.4%	0.2%
	Other/unknown	1.3%	1.1%
Flats (n=5,395)	U = 0.13–0.20 W/m2K	2.7%	0.4%
	U = 0.21–0.30 W/m2K	6.2%	1.9%
EPC D–G flats (n=2,040)	U = 0.31–0.45 W/m2K	1.3%	1.3%
	U = 0.46–1.80 W/m2K	0.5%	0.3%
	Cavity wall, as built – partially/fully insulated*	**30.1%**	16.7%
	Cavity wall, as built – no insulation*	7.6%	15.1%
	Cavity wall, as built – filled cavity	28.1%	19.6%
	Solid brick, as built – no insulation*	13.9%	**31.6%**
	Solid brick – internal/external insulation	3.5%	3.8%
	System built, as built – no insulation*	1.5%	3.6%
	System built – internal/external insulation	2.6%	3.4%
	Other/unknown	2.0%	2.3%
Detached bungalows (n=2,482)	U = 0.13–0.20 W/m2K	0.4%	<0.1%
	U = 0.21–0.30 W/m2K	1.5%	<0.1%
	U = 0.31–0.45 W/m2K	<0.1%	<0.1%
EPC D–G detached bungalows (n=2,482)	U = 0.46–1.80 W/m2K	<0.1%	<0.1%
	Cavity wall, as built – partially/fully insulated*	14.4%	13.1%
	Cavity wall, as built – no insulation*	13.9%	16.7%
	Cavity wall, as built – filled cavity	**53.5%**	**51.7%**
	Solid brick, as built – no insulation*	13.2%	15.7%
	Solid brick – internal/external insulation	0.6%	0.3%
	System built, as built – no insulation*	0.1%	0.2%
	System built – internal/external insulation	<0.1%	<0.1%
	Other/unknown	2.4%	2.5%

ROOF

Table 12: Roof fabric breakdown

Property-build type	Roof type	Proportion per house type	Proportion per house type (EPC D–G)
Detached houses (n=7,607)	U = 0.07–0.15 W/m2K	8.6%	<0.1%
	U = 0.16–0.20 W/m2K	1.2%	<0.1%
	U = 0.21–2.30 W/m2K	0.1%	<0.1%
EPC D–G detached houses (n=5,356)	Pitched – no insulation*	5.4%	7.6%
	Pitched – insulated (unknown dimensions)	5.6%	5.0%
	Pitched – 12–50mm loft insulation	4.1%	5.5%
	Pitched – 75mm loft insulation	4.6%	5.9%
	Pitched – 100mm loft insulation	13.5%	**16.2%**
	Pitched – 150mm loft insulation	12.8%	14.6%
	Pitched – 200mm loft insulation	14.2%	14.8%
	Pitched – 250mm loft insulation	13.9%	14.6%
	Pitched – over 250mm loft insulation	**14.3%**	13.9%
	Flat – partially/fully insulated*	0.4%	0.5%
	Flat – no insulation*	0.1%	0.1%
	Another dwelling above	<0.1%	<0.1%
	Other/unknown	1.2%	1.2%
Semi-detached houses (n=11,105)	U = 0.07–0.15 W/m2K	6.0%	<0.1%
	U = 0.16–0.20 W/m2K	0.9%	0.1%
	U = 0.21–2.30 W/m2K	0.3%	0.3%
EPC D–G semi-detached houses (n=8,478)	Pitched – no insulation*	10.9%	14.1%
	Pitched – insulated (unknown dimensions)	3.2%	3.0%
	Pitched – 12–50mm loft insulation	5.5%	6.7%
	Pitched – 75mm loft insulation	6.4%	7.5%
	Pitched – 100mm loft insulation	**14.5%**	**16.1%**
	Pitched – 150mm loft insulation	11.5%	12.3%
	Pitched – 200mm loft insulation	13.2%	13.2%

	Pitched – 250mm loft insulation	12.9%	12.7%
	Pitched – over 250mm loft insulation	12.9%	12.1%
	Flat – partially/fully insulated*	0.4%	0.4%
	Flat – no insulation*	0.1%	0.1%
	Another dwelling above	0.1%	<0.1%
	Other/unknown	1.3%	1.3%
Mid-terrace houses (n=4,559)	U = 0.07–0.15 W/m2K	5.3%	<0.1%
	U = 0.16–0.20 W/m2K	0.6%	<0.1%
	U = 0.21–2.30 W/m2K	<0.1%	0.1%
EPC D–G mid-terrace houses (n=2,890)	Pitched – no insulation*	**16.4%**	**25.7%**
	Pitched – insulated (unknown dimensions)	3.9%	3.5%
	Pitched – 12–50mm loft insulation	4.9%	6.4%
	Pitched – 75mm loft insulation	5.9%	6.8%
	Pitched – 100mm loft insulation	13.9%	15.3%
	Pitched – 150mm loft insulation	11.7%	10.6%
	Pitched – 200mm loft insulation	12.5%	10.6%
	Pitched – 250mm loft insulation	12.0%	10.4%
	Pitched – over 250mm loft insulation	11.2%	8.9%
	Flat – partially/fully insulated*	0.4%	0.6%
	Flat – no insulation*	0.2%	0.2%
	Another dwelling above	0.2%	0.1%
	Other/unknown	1.0%	0.9%
End-terrace houses (n=3,111)	U = 0.07–0.15 W/m2K	9.6%	<0.1%
	U = 0.16–0.20 W/m2K	0.7%	<0.1%
	U = 0.21–2.30 W/m2K	0.2%	0.2%
EPC D–G end-terrace houses (n=2,069)	Pitched – no insulation*	11.4%	**17.0%**
	Pitched – insulated (unknown dimensions)	4.4%	3.3%
	Pitched – 12–50mm loft insulation	4.3%	5.9%
	Pitched – 75mm loft insulation	4.9%	6.4%
	Pitched – 100mm loft insulation	**14.0%**	16.8%
	Pitched – 150mm loft insulation	11.2%	12.9%
	Pitched – 200mm loft insulation	11.7%	11.7%
	Pitched – 250mm loft insulation	12.8%	12.5%
	Pitched – over 250mm loft insulation	12.8%	11.8%
	Flat – partially/fully insulated*	0.2%	0.1%
	Flat – no insulation*	0.1%	0.1%
	Another dwelling above	0.2%	0.2%
	Other/unknown	1.4%	0.9%
Flats (n=5,395)	U = 0.07–0.15 W/m2K	3.4%	0.9%
	U = 0.16–0.20 W/m2K	1.5%	0.8%
	U = 0.21–2.30 W/m2K	0.2%	0.2%
EPC D–G flats (n=2,040)	Pitched – no insulation*	3.9%	10.0%
	Pitched – insulated (unknown dimensions)	5.2%	5.6%
	Pitched – 12–50mm loft insulation	1.5%	2.4%
	Pitched – 75mm loft insulation	0.9%	1.5%
	Pitched – 100mm loft insulation	4.4%	5.4%
	Pitched – 150mm loft insulation	3.6%	3.0%
	Pitched – 200mm loft insulation	4.9%	4.4%
	Pitched – 250mm loft insulation	5.8%	4.0%
	Pitched – over 250mm loft insulation	7.5%	3.6%
	Flat – partially/fully insulated*	3.7%	7.5%
	Flat – no insulation*	1.3%	3.3%
	Another dwelling above	**51.3%**	**45.2%**
	Other/unknown	0.8%	1.5%
Detached bungalows (n=2,482)	U = 0.07–0.15 W/m2K	1.7%	<0.1%
	U = 0.16–0.20 W/m2K	0.2%	<0.1%
	U = 0.21–2.30 W/m2K	<0.1%%	<0.1%
	Pitched – no insulation*	4.9%	5.9%
	Pitched – insulated (unknown dimensions)	4.5%	4.5%
	Pitched – 12–50mm loft insulation	4.0%	4.8%

EPC D–G detached bungalows (n=2,482)	Pitched – 75mm loft insulation	4.5%	5.4%
	Pitched – 100mm loft insulation	11.4%	12.8%
	Pitched – 150mm loft insulation	10.9%	11.2%
	Pitched – 200mm loft insulation	16.0%	15.6%
	Pitched – 250mm loft insulation	18.4%	17.6%
	Pitched – over 250mm loft insulation	**22.0%**	**20.9%**
	Flat – partially/fully insulated*	0.3%	0.3%
	Flat – no insulation*	0.1%	0.1%
	Another dwelling above	NA	NA
	Other/unknown	1.2%	1.1%

FLOOR

Table 13: Floor fabric breakdown

Property-build type	Floor type	Proportion per house type	Proportion per house type (EPC D–G)
Detached houses (n=7,607)	U = 0.02–0.15 W/m2K	5.7%	<0.1%
	U = 0.16–0.20 W/m2K	2.7%	<0.1%
	U = 0.21–1.20 W/m2K	1.4%	<0.1%
EPC D–G detached houses (n=5,356)	Solid – partially/fully insulated*	9.0%	3.8%
	Solid – no insulation*	**44.2%**	**49.9%**
	Suspended – partially/fully insulated*	2.3%	1.5%
	Suspended – no insulation*	34.5%	44.6%
	Another premises/dwelling below	0.1%	0.1%
	Other/unknown	0.1%	0.1%
Semi-detached houses (n=11,105)	U = 0.02–0.15 W/m2K	4.5%	<0.1%
	U = 0.16–0.20 W/m2K	1.6%	<0.1%
	U = 0.21–1.20 W/m2K	1.1%	0.4%
EPC D–G semi-detached houses (n=8,478)	Solid – partially/fully insulated*	3.3%	1.1%
	Solid – no insulation*	**47.2%**	48.2%
	Suspended – partially/fully insulated*	1.1%	0.7%
	Suspended – no insulation*	40.8%	**49.2%**
	Another premises/dwelling below	0.1%	0.1%
	Other/unknown	0.3%	0.3%
Mid-terrace houses (n=4,559)	U = 0.02–0.15 W/m2K	3.5%	<0.1%
	U = 0.16–0.20 W/m2K	1.2%	<0.1%
	U = 0.21–1.20 W/m2K	1.2%	0.1%
EPC D–G mid-terrace houses (n=2,890)	Solid – partially/fully insulated*	6.1%	0.8%
	Solid – no insulation*	**57.2%**	**59.5%**
	Suspended – partially/fully insulated*	0.9%	0.3%
	Suspended – no insulation*	28.8%	38.1%
	Another premises/dwelling below	0.2%	0.3%
	Other/unknown	0.9%	0.9%
End-terrace houses (n=3,111)	U = 0.02–0.15 W/m2K	6.5%	<0.1%
	U = 0.16–0.20 W/m2K	2.4%	<0.1%
	U = 0.21–1.20 W/m2K	1.6%	0.2%
EPC D–G end-terrace houses (n=2,069)	Solid – partially/fully insulated*	8.4%	1.6%
	Solid – no insulation*	**52.6%**	**60.5%**
	Suspended – partially/fully insulated*	1.4%	0.5%
	Suspended – no insulation*	25.8%	36.0%
	Another premises/dwelling below	0.4%	0.3%
	Other/unknown	0.7%	0.9%
Flats (n=5,395)	U = 0.02–0.15 W/m2K	3.0%	0.6%
	U = 0.16–0.20 W/m2K	1.1%	0.6%
EPC D–G flats (n=2,040)	U = 0.21–1.20 W/m2K	1.3%	1.5%
	Solid – partially/fully insulated*	4.7%	2.6%
	Solid – no insulation*	23.7%	28.0%
	Suspended – partially/fully insulated*	1.0%	0.8%
	Suspended – no insulation*	4.1%	6.3%
	Another premises/dwelling below	**59.5%**	**56.8%**

	Other/unknown	1.6%	2.7%
Detached bungalows (n=2,482)	U = 0.02–0.15 W/m2K	0.6%	<0.1%
	U = 0.16–0.20 W/m2K	1.1%	<0.1%
	U = 0.21–1.20 W/m2K	0.1%	<0.1%
EPC D–G detached bungalows (n=2,482)	Solid – partially/fully insulated*	2.9%	1.3%
	Solid – no insulation*	**53.0%**	**53.1%**
	Suspended – partially/fully insulated*	1.5%	0.8%
	Suspended – no insulation*	40.6%	44.6%
	Another premises/dwelling below	NA	NA
	Other/unknown	0.1%	0.2%

WINDOWS

Table 14: Window type breakdown

Property-build type	Window (glazing) type	Proportion per house type	Proportion per house type (EPC D–G)
Detached houses (n=7,607)	Full single glazing	1.7%	2.3%
	Partial double glazing	10.0%	13.9%
	Full double glazing	**78.6%**	**82.9%**
EPC D–G detached houses (n=5,356)	High performance glazing	0.5%	0.7%
	Secondary glazing	8.9%	<0.1%
	Other/unknown	0.3%	0.2%
Semi-detached houses (n=11,105)	Full single glazing	2.0%	2.5%
	Partial double glazing	10.0%	12.5%
	Full double glazing	**80.7%**	**84.4%**
EPC D–G semi-detached houses (n=8,478)	High performance glazing	0.3%	0.3%
	Secondary glazing	6.7%	<0.1%
	Other/unknown	0.2%	0.2%
Mid-terrace houses (n=4,559)	Full single glazing	3.3%	5.0%
	Partial double glazing	8.9%	12.8%
	Full double glazing	**82.8%**	**81.8%**
EPC D–G mid-terrace houses (n=2,890)	High performance glazing	0.1%	0.2%
	Secondary glazing	4.8%	0.1%
	Other/unknown	0.1%	0.1%
End-terrace houses (n=3,111)	Full single glazing	2.5%	3.7%
	Partial double glazing	7.3%	10.4%
	Full double glazing	**80.6%**	**85.3%**
EPC D–G end-terrace houses (n=2,069)	High performance glazing	0.4%	0.4%
	Secondary glazing	9.0%	<0.1%
	Other/unknown	0.2%	0.1%
Flats (n=5,395)	Full single glazing	1.6%	2.9%
	Partial double glazing	4.1%	9.2%
EPC D–G flats (n=2,040)	Full double glazing	**84.3%**	**84.1%**
	High performance glazing	0.8%	1.0%
	Secondary glazing	9.0%	2.5%
	Other/unknown	0.2%	0.2%
Detached Bungalows (n=2,482)	Full single glazing	1.3%	1.5%
	Partial double glazing	7.0%	8.2%
	Full double glazing	**89.4%**	**89.6%**
EPC D–G detached bungalows (n=2,482)	High performance glazing	0.4%	0.4%
	Secondary glazing	1.7%	<0.1%
	Other/unknown	0.3%	0.2%

Table 15: Building elements and their common types

Property-build type	Building element	Most common among type
	Walls	Solid brick, as built – no insulation
	Roof	Pitched – over 250mm loft insulation

Detached houses (n=7,607)	Floor	Solid – no insulation
	Windows	Full double glazing
Semi-detached houses (n=11,105)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – 100mm loft insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
Mid-terrace houses (n=4,559)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – no insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
End-terrace houses (n=3,111)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – 100mm loft insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
All flats (n=5,395)	Walls	Cavity wall, as built – partially/fully insulated
	Roof	Another dwelling above
	Floor	Another premises/dwelling below
	Windows	Full double glazing
Detached bungalows (n=2,482)	Walls	Cavity wall, as built – filled cavity
	Roof	Pitched – over 250mm loft insulation
	Floor	Solid – no insulation
	Windows	Full double glazing

Table 16: Building elements and their common types in EPC D-G properties

Property-build type	Building element	Most common among **EPC D–G only**
EPC D–G detached houses (n=5,356)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – 100mm loft insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
EPC D–G semi-detached houses (n=8,478)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – 100mm loft insulation
	Floor	Suspended – no insulation
	Windows	Full double glazing
EPC D–G mid-terrace houses (n=2,890)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – no insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
EPC D–G end-terrace houses (n=2,069)	Walls	Solid brick, as built – no insulation
	Roof	Pitched – no insulation
	Floor	Solid – no insulation
	Windows	Full double glazing
EPC D–G flats (n=2,040)	Walls	Solid brick, as built – no insulation
	Roof	Another dwelling above
	Floor	Another premises/dwelling below
	Windows	Full double glazing
EPC D–G detached bungalows (n=2,482)	Walls	Cavity wall, as built – filled cavity
	Roof	Pitched – over 250mm loft insulation
	Floor	Solid – no insulation
	Windows	Full double glazing

1.9 Broxtowe Housing Stock Characterisation: Fuel Poverty Analysis

This section provides an overview of fuel poverty in Broxtowe, according to the UK Government's Low Income Low Energy Efficiency (LILEE) definition. The most recent data (DESNZ, 2024) show that Broxtowe has a LILEE fuel poverty rate of 13.5%, which is slightly higher than the English average (13.1%), but lower than the typical rate across the East Midlands (15.1%). Figure 8 shows

the spatial distribution of LILEE fuel poverty across Lower Super Output Areas (LSOAs) in Broxtowe. LSOAs are a standardised, geographical unit used to divide local authorities into more manageable small areas with approximately consistent populations. The univariate map (i.e., displaying a single variable – LILEE fuel poverty rate per LSOA) shows that LILEE fuel poverty tends to be clustered around the LSOAs with the highest population density (i.e., the LSOAs with the smallest geographical areas). This is to be expected, and similar clustering has been observed in other studied areas, including Nottingham and London. It is also worth noting that the irregularity of the scale (e.g., 4–9.7%) is induced by the division of Broxtowe's LSOAs into five fuel poverty quintiles, hence each colour represents the lowest to highest quintile of fuel poverty compared to the Broxtowe baseline rate (13.5%).

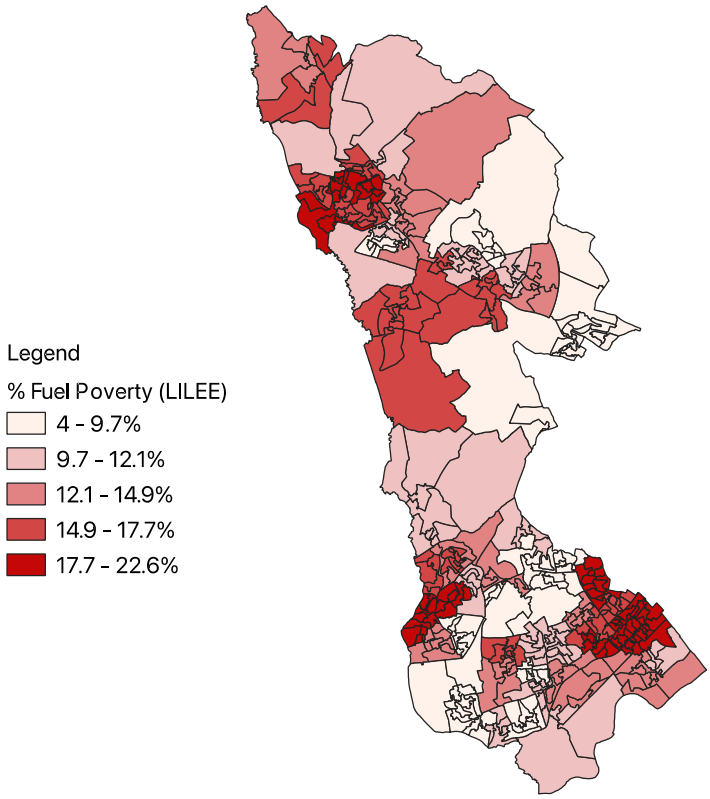


Figure 8: Univariate, quintile-aggregated LILEE fuel poverty map for Broxtowe LSOAs

Due to how the LILEE definition is formulated, there are concerns that the true extent of fuel poverty in England may be trivialised. LILEE, which was adopted as the official definition in 2019, controversially omits homes with Fuel Poverty Energy Efficiency Rating (FPEER) bands of C or above. The FPEER banding system is equivalent to EPC bands in almost all cases. The implication is that homes rated A–C cannot experience fuel poverty; however, our previous research has shown that a considerable proportion of low-income people living in A–C rated properties still experience energy insecurity, which is a form of self-reported or subjective fuel poverty. To partially express this issue in Broxtowe, Figure 9 displays a bivariate map of LILEE fuel poverty versus Index of Multiple Deprivation (IMD), per LSOA. The purpose of this map is to demonstrate that there are a considerable number of LSOAs that have middling to high deprivation but low rates of LILEE fuel poverty; these instances are denoted by light blue (legend code B1) and turquoise (legend code C1). It is highly likely that, within these identified LSOAs, there are many low-income homes that are misclassified as not fuel poor under LILEE.

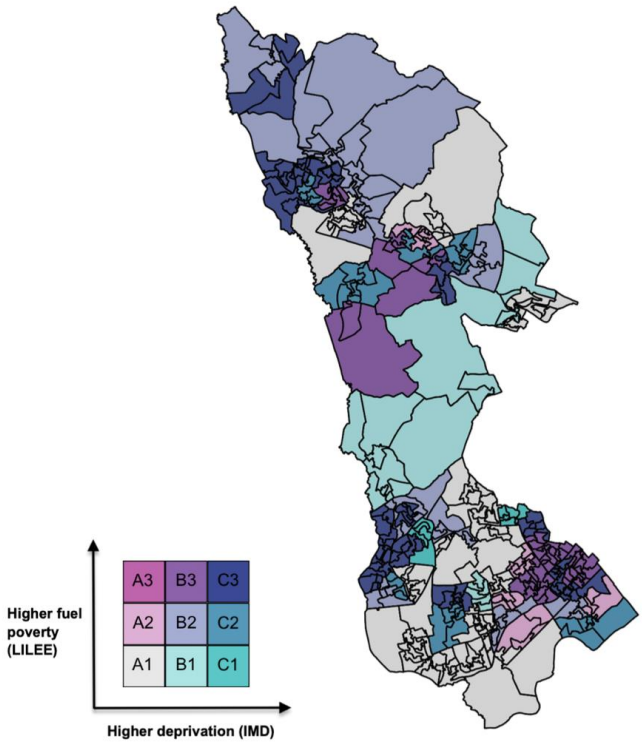


Figure 9: Bivariate map for Broxtowe: LILEE fuel poverty versus deprivation (IMD)

To further illustrate the deficiencies of the LILEE definition, the following calculations provide an estimate of low-income homes (where the main earner is unemployed or economically inactive) with EPC ratings of C or above in Broxtowe. We suggest that homes meeting this description are unlikely to be able to *afford adequate warmth*, which is the typically recognised definition of fuel poverty across Europe and other British nations. In the housing characterisation section, it was shown that 33.8% (n=12,491) of homes in Broxtowe have EPC ratings of A–C. Among this A–C subset, Table 17 displays typical tenure status. The remainder of this section only focuses on socially and privately rented homes, given the likelihood that people living in these tenures are significantly more likely to be in financially vulnerable or precarious situations.

Table 17 Tenure status among EPC A–C rated properties in Broxtowe

Tenure Status	Frequency (among A–C subset, n=12,491) (% of subset in parentheses)
Owner-occupied	5070 (40.6%)
Privately rented	1865 (14.9%)
Socially rented	2977 (23.8%)
Unknown	2435 (19.5%)

Among socially (n=2,977) and privately rented (n=1,865) tenures, there are a combined 4,482 homes. By integrating employment information from the English Housing Survey (DLUHC, 2023), it is possible to roughly estimate the number of EPC A–C-rated, socially or privately rented, financially vulnerable homes in Broxtowe. The proportion of main earners who are unemployed or economically inactive is 31.6% and 16.6% in socially and privately rented properties, respectively. Then, it follows that 31.6% of the 2,977 socially rented homes (~941) are at risk of income-induced fuel poverty, despite their default omission under LILEE. Among privately rented properties, the equivalent figure

is around 310 homes. In summary, 1,251 homes (around 3.4% of the entire Broxtowe housing stock) are wrongly omitted from fuel poverty statistics.

2 Retrofit Generic Housing Performance Assessment

For the purpose of this report, the retrofit process is divided into three key stages, as outlined below:

- Retrofit stage 1: consists of fabric improvements to reduce operational energy consumption and carbon emissions
- Retrofit stage 2: considers retrofit stage 1, combined with the integration of low-carbon heating systems
- Retrofit stage 3: consists of retrofit stage 2 with the integration of renewable energy generation

The aforementioned stages can be implemented as part of a typical retrofit or deep retrofit approach. Simply put, typical retrofits are usually easier to implement as they are less costly and less disruptive to occupants. The typical retrofit approach, alone, results in moderate energy savings and performance improvements.

Alternatively, deep retrofit measures involve more comprehensive upgrades. Unlike typical retrofits, deep retrofitting involves the upgrade of multiple systems, including building envelope (e.g. floor insulation) as well as electrical, structural, and mechanical components. As mentioned previously, it is this extensive nature of deep retrofits that incur higher upfront costs and disruptions for occupants, in comparison to less invasive typical retrofits. Despite the longer project duration required for implementation, deep retrofitting can result in significant performance enhancements and long-term energy savings.

In reality, deep retrofitting is often unfeasible, due to financial constraints and the level of disruption to occupants, as previously discussed; in some other cases deep retrofitting is incompatible with the protection of historically significant buildings and/or building features. It is therefore often more realistic to design an approach based on incremental improvements, in which a long-term plan accounts for all the required upgrades. However, if possible, deep retrofitting should be undertaken in a single go, which can maximise quality and reduce costs.

A more pragmatic approach would be to consider the implementation of typical retrofit measures in a scenario where decarbonisation efforts are at the forefront. By decarbonising our energy sources, we can reduce greenhouse gas emissions, lower energy costs, and improve energy efficiency in our homes. Combined with typical retrofit measures, decarbonisation can help us ensure that we provide superior quality homes within a shorter period and at a substantially lower retrofit cost. Other additional benefits include enabling improved energy security by reducing reliance on fossil fuels, promoting the health of citizens because of reduced pollution, and aligning with regulatory requirements.

This section presents the findings of the generic housing stock energy performance assessment. Both typical and deep retrofitting approaches are considered. The performance of retrofitted homes is calculated using thermal dynamic building simulation, based on typical inputs and housing characteristics. The thermal dynamic building simulations were produced in IESVE simulation software. IESVE is a commonly used, industry-standard building simulation tool (Jankovic, 2017).

The optimisation of the building envelope, known as a ‘fabric first’ approach, includes the reduction of overall envelope U-values and improvements to air permeability. The main aim is to get the existing housing stock up to the Future Homes Standard (Ministry of Housing; Communities and Local Government, 2019), which will become mandatory for all new builds from 2025. The U-values that will appear in the updated Building Regulations Part L 2021 will show a minimum value (higher U-value) that must be achieved for each building component, e.g., roof, walls, windows, plus a stricter ‘notional value’ that needs to be reached across all elements to achieve compliance. In other

words, there is a degree to which some elements can be offset against others by going over that minimum value where it is easy to do so (in the roof, for instance).

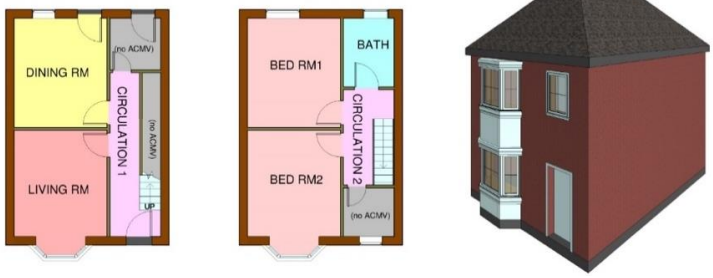
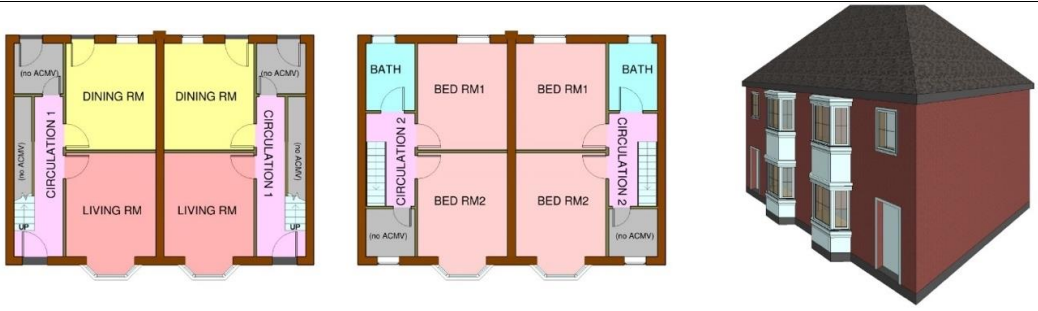
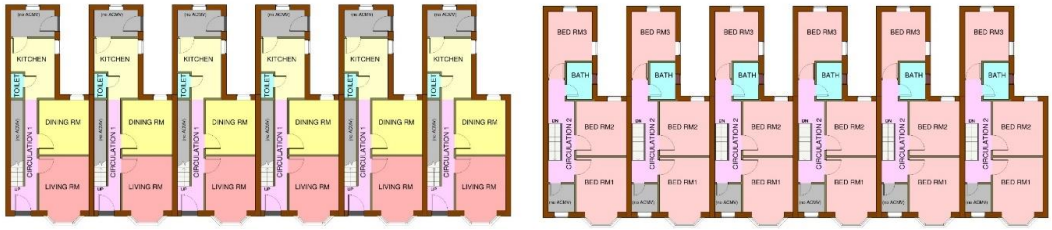
2.1 Simulation Models, Stages and Assumptions

This section presents the building models (or archetypes), retrofit stages and assumptions used in the simulations.

Models

For the simulations to be realistic and relevant to the current Broxtowe housing stock, five models were developed to represent the most typical house types identified in Section 1.8. The property types of interest in Broxtowe are detached, semi-detached, mid-terrace and end-terrace houses, and flats. Table 18 illustrates these, along with the corresponding geometric data, shown in Table 19. Each of these models varies in layout, floor area, number of bedrooms, and occupancy, with the number of occupants determined by the number of bedrooms. These factors all contribute to differences in energy consumption and performance levels. While this approach provides a more accurate representation of the energy use and performance levels of the different archetypes, it is crucial to understand these differences; therefore, each model needs to be assessed separately.

Table 18: Housing archetypes – floor plans and perspectives

Detached Bedrooms: 2 Occupancy: 3	
Semi-detached Bedrooms: 2 Occupancy: 3	
Mid-terrace & End-terrace Bedrooms: 3 Occupancy: 4	

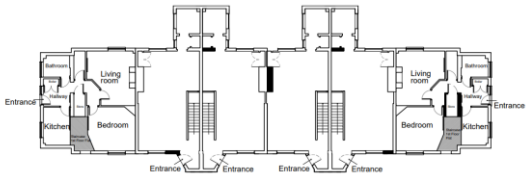
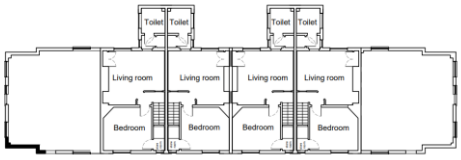
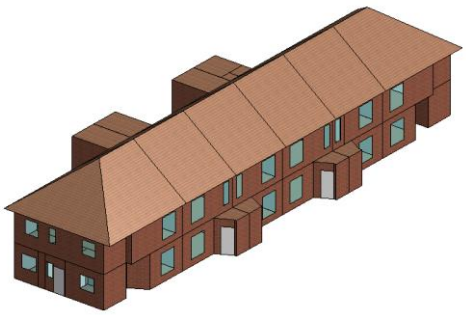
	
Flats Bedrooms: 1 Occupancy: 2	  

Table 19: Housing archetypes – Building geometry data and air permeability assumptions

Building Components	Detached house	Semi-Detached house	Mid-terrace house	End-terrace house	Mid-terrace Flat_FF	End-terrace Flat_GF
	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)	Area (m^2)
Ground Floor Area	48.72	48.72	50.28	50.28	50.9	62
Total Floor Area	89.9	89.9	89.7	89.7	50.9	62
Roof (ceiling level)	57.6	53.84	53.2	53.2	50.9	62
Roof (if sloped)	76	62.74	83.07	83.07	62	
Wall (External walls + party walls as they are considered permeable)	159	112	115.36	152.32	81.6	79.2
Window	9.3	9.3	10.68	10.68	7.3	8.07
External Door	5.67	5.67	5.67	5.67	1.8	1.8
Roof Volume (m^3)	60.92	52.2	68.74	72.1	85.54	107
All internal air volume (m^3) (for infiltration calculation)	333.76	325	343.58	346.94	122.16	148.8
Wall + Roof + Ground Floor Area (Building Fabric area used for infiltration calculation)	265.32	214.56	218.84	255.8	183.4	203.2
ACH if airtight test (very leaky type) is 15 m^3/hm^2 @ 50Pa (and 1/20 rule) -Test / Base	0.60	0.50	0.48	0.55	1.13	1.02

ACH if airtight test is 8 m^3/hm^2 @ 50Pa (and 1/20 rule) - Optimised to Part L 2021 max. permitted	0.32	0.26	0.25	0.29	0.60	0.55
ACH if airtight test is 5 m^3/hm^2 @ 50Pa (and 1/20 rule) - Optimised to Part L 2021 notional	0.20	0.17	0.16	0.18	0.38	0.34

Retrofit Stage 1

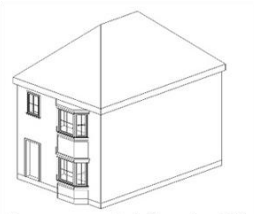
Retrofit stage 1 is exclusively limited to fabric improvements to reduce operational energy consumption and carbon emissions. A total of six simulation scenarios (base scenario plus five levels of building fabric improvements) were investigated, as outlined in Table 20. The key 'fabric first' measures included in this stage are loft insulation, floor insulation (when viable and affordable), wall insulation, triple glazing, and air tightness.

The scenarios considered in this investigation accounted for the likelihood and feasibility of the changes and these are:

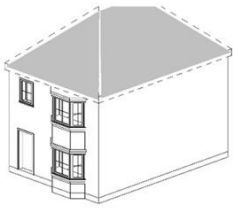
- Loft insulation, measured in W/m^2K
- Floor insulation, measured in W/m^2K
- Wall insulation, measured in W/m^2K
- Triple glazing, measured in W/m^2K
- Airtightness (Draught Proofing), measured in m^3/hm^2 @ 50Pa

Table 20: Retrofit stage 1 – building fabric improvement – simulation scenarios analysed

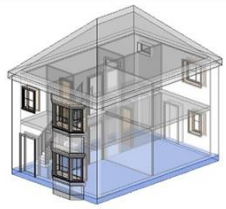
1	Base case as-built (scenario 1) – with highly infiltrated (15 m^3/m^2h), poorly or non-insulated building envelope.
2	Added loft Insulation to scenario #1 (Part L 2021 notional levels)
3	Added loft insulation + solid floor insulation to scenario #2 (based on the most feasible and less destructive option)
4	Added loft insulation + floor insulation + external insulation on the walls to scenario #3 (Part L 2021 notional levels)
5	Added loft insulation + floor insulation + wall insulation + energy-efficient glazing and doors (low U-value glazing) to scenario #4 (Part L 2021 notional levels)
6	Added loft insulation + floor insulation + wall insulation + energy-efficient glazing and doors + draught-proofing and airtight layer (8 m^3/m^2h) to scenario #5 (Part L 2021)
7	Added loft insulation + floor insulation + wall insulation + energy-efficient glazing and doors + additional draught-proofing and airtight layer (5 m^3/m^2h) to scenario #6 (Part L 2021 notional levels)
An illustration of the simulation's steps for a detached house for deep retrofit.	



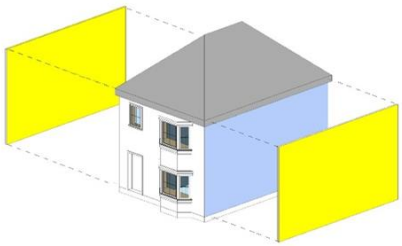
1. Base model (as-built)

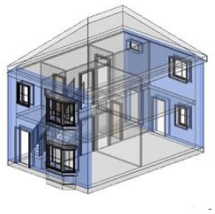


2. Loft insulation



3. Floor insulation

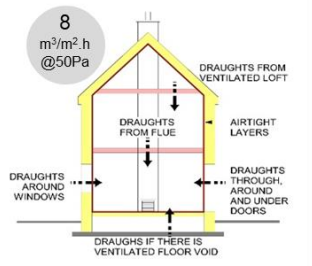




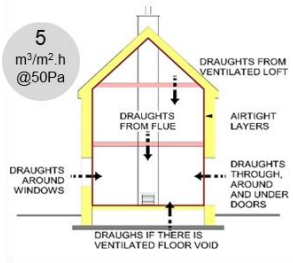
4. Wall insulation



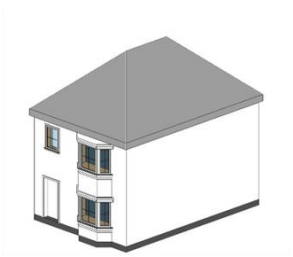
5. Energy-efficient glazing/ doors



6. Draught proofing and airtight envelope

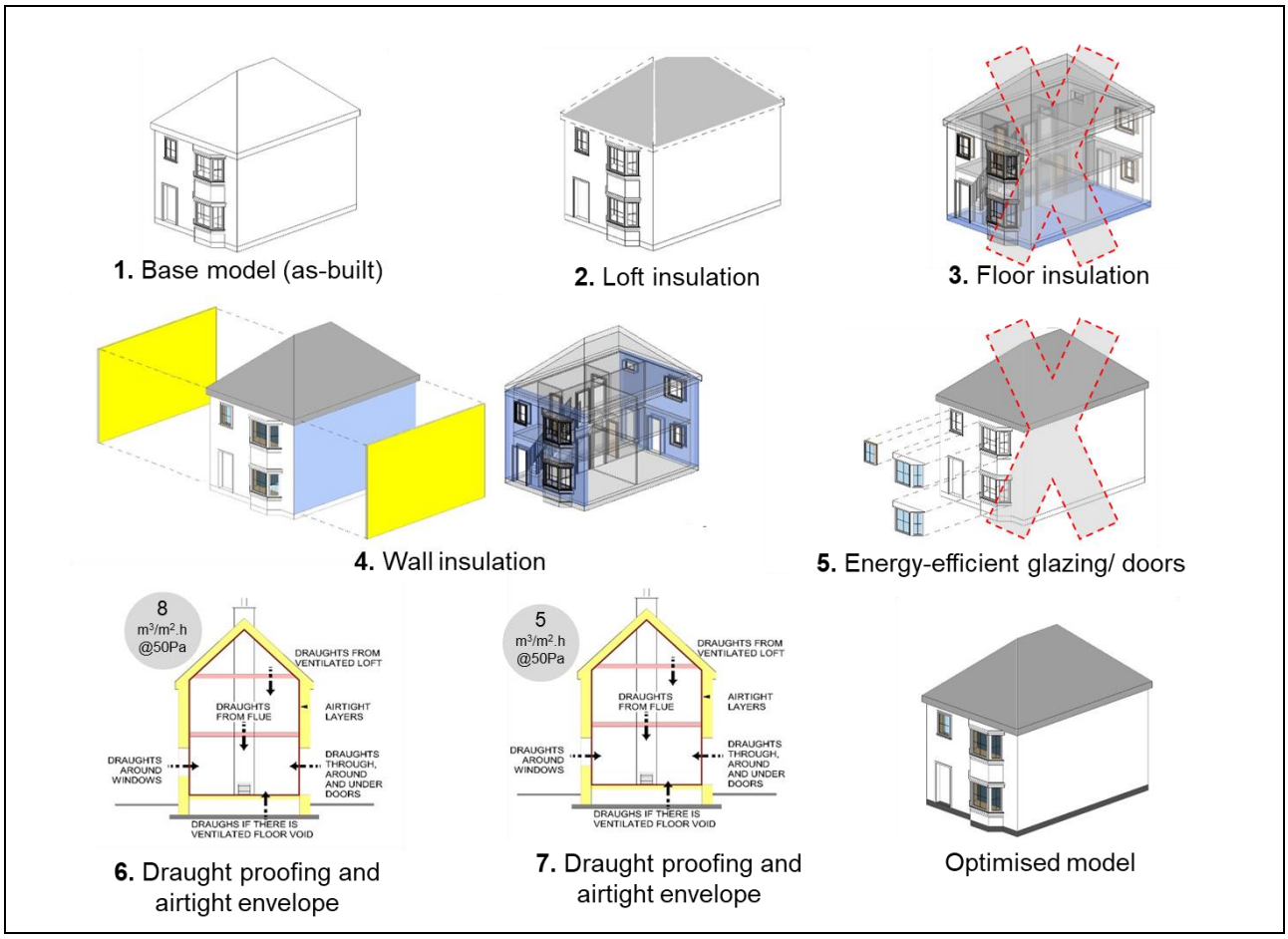


7. Draught proofing and airtight envelope



Optimised model

An illustration of the simulation's steps for a detached house for typical retrofit.



Retrofit Stage 2 & 3

Retrofit Stage 2 (Table 21) and Stage 3 (Table 22) compare the impacts of passive measures through fabric improvements when combined with low-carbon heating systems and energy generation, respectively. ASHPs and solar photovoltaics (PV) were proposed to investigate potential reductions in energy consumption, carbon emissions, and energy prices after the passive energy measures are added.

Table 21: Retrofit Stage 2 – integration of low-carbon heating systems – simulation scenarios analysed

Scenario 2.1	ASHP

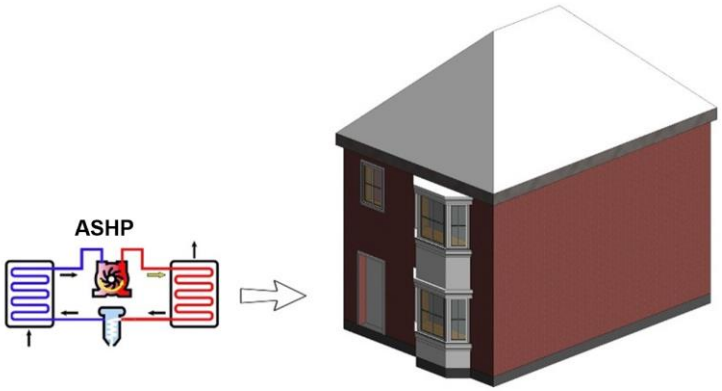
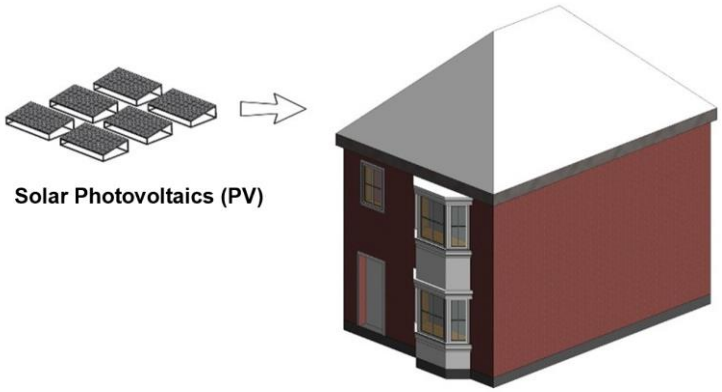


Table 22: Retrofit Stage 3 – renewable energy generation – simulation scenarios analysed

Scenario 3.1	solar photovoltaics (PV)



Simulation Assumptions

The assumptions adopted in the simulations are described in Table 23. Heating and cooling setpoints were based on CIBSE (2019b). Cooling indoor temperature limits, window opening regimes and duration of the cooling season were based on TM59 (CIBSE, 2017). Windows in each room were set to be controlled separately and modelled as open when both the internal dry bulb temperature exceeds 22°C and the room is occupied (CIBSE, 2017). A detailed heat gain profile is shown in the appendices. Internal doors can be included and left open in the model in the daytime but should be assumed closed when the occupants are sleeping (23 to 8h).

Table 23: Assumptions adopted in the simulation models

Parameter	Description	Assumption	Ref / Profile
Weather	Nottingham	Typical weather year	Nottingham_CIBSE-TRY
Air permeability	Base case	15 m^3/hm^2 @ 50Pa	
	Improved scenario	8 m^3/hm^2 @ 50Pa	
	Further improved scenario	5 m^3/hm^2 @ 50Pa	Future Homes Standard (Ministry of Housing; Communities and Local Government, 2021)
Heating profile	Base case heating setpoint	Lower thermal comfort temperature limits in dwellings according to CIBSE (2019b, p. 1-10): Bathrooms: 20°C Bedroom: 17°C Circulation: 19°C Kitchen: 17°C Living: 22°C	Extended from October to March
Cooling profile and window opening	Base case	No cooling	
	Test scenario for summer cooling (window opening)	Start to open when the internal temperature exceeds 22°C, fully opened when the internal temperature exceeds 26°C. Start to close when the internal temperature falls below 26°C, fully closed when the internal temperature falls below 22°C (HM Government, 2021a, p. 8). Closed if the outdoor temperature > 26°C	From May to September (CIBSE, 2017)
	Test scenario for summer cooling (mixed-mode)	Window is closed. Same cooling set point as above.	From May to September (CIBSE, 2017)
	Cooling set points	Lower summer operative temperature limits in dwellings when conditioned according to CIBSE (2019b, p. 1-10): Bathrooms: 23°C Bedroom: 23°C Circulation: 21°C Kitchen: 21°C Living:23°C	Whenever summer cooling was considered.
Internal gains, based on TM59 (CIBSE, 2017, p. 6-9)	Bedroom Occupancy	Sensible 75 W/person, Latent 55 W/person, Density 2; 70% during sleep activity	As per schedule
	Bedroom Lighting	2 W/m^2, Radiant Fraction 0.45,	18-23 hour
	Bedroom Equipment	Sensible 80 Watts, Radiant Fraction 0.22	As per schedule
	Living Room Occupancy	Sensible 75 W/person, Latent 55 W/person, Density 2	As per schedule
	Living Room Lighting	2 W/m^2, Radiant Fraction 0.45	18-23 hour
	Living Room - Equipment	Sensible 150 Watts, Radiant Fraction 0.22	As per schedule
	Kitchen - Occupancy	Sensible 75 W/person, Laten 55 W/person, Density 2	As per schedule
	Kitchen - Lighting	2 W/m^2, Radiant Fraction 0.45	18-23 hour
	Kitchen - Equipment	Sensible 300 Watts, Radiant Fraction 0.22	As per schedule
	Circulation area and	2 W/m^2, Radiant Fraction 0.45	18-23 hour

	bathroom - Lighting -		
	Bedroom Equipment	Sensible 1.75 W/m^2, Radiant Fraction 0.22	18-23 hour
Heating system	Base case / Improved scenarios	Seasonal efficiency: 0.89 SCoP (kW/kW): 0.8 No ventilation heat recovery No CH(C)P	Normal natural gas metre
	Test scenarios for ASHP	Central heating system through radiators. SCoP for Space heating – 1.8 for non-retrofit and increased to 2.8 at later stages SCoP for Domestic hot water - 1.5 for non-retrofit and increased to 2 at later stages (see Section 2.4)	ASHP (electricity)
Cooling system	Test scenarios for summer cooling	Air conditioning	Electricity: Meter

In this study, the air permeability of the building envelope (measured at @50Pa) was converted to infiltration using the 'divided by 20' rule and normalised by the envelope area of each typology. For example, a building with an area of 130m^2, with a volume of 230m^3 and measured air permeability of 15m^3/m^{2}h @50Pa, would have an infiltration calculated as: $[(15\ \frac{m^3}{m^2.\ h}\ @50Pa\ \times \frac{130\ m^2}{230\ m^3}) \div 20] = 0.42\ ach$. Please note that dynamic building simulation software requires an input as infiltration.

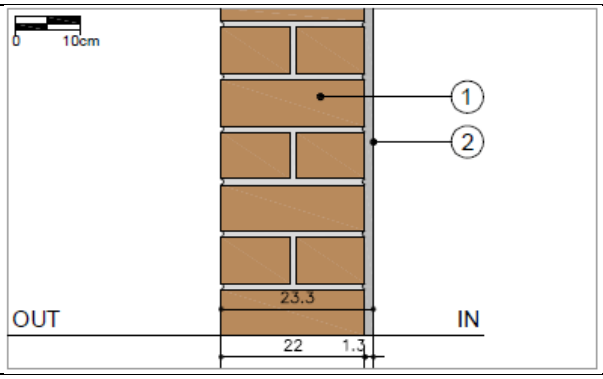
2.2 Building Fabric

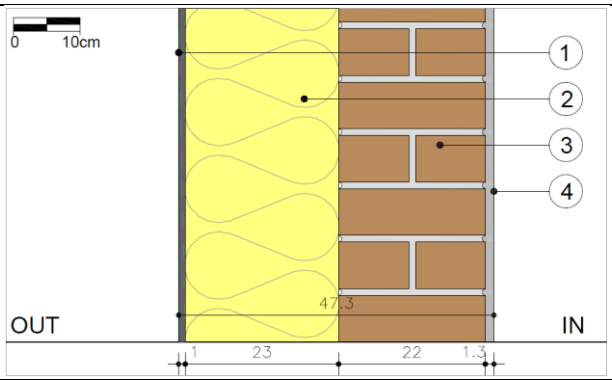
In this section, each construction component (walls, roof, floor, glazing and doors) is reviewed in terms of its material composition and typical U-value. An optimised component is then proposed, based on national standards, and best retrofit practices (as shown in Section 1.2). Please note that notional Part L2021 U-value limits were adopted.

Walls

Wall construction type (as-built and optimised) is illustrated in Table 24

Table 24: Wall construction type – as-built and optimised, based on CIBSE (2019a, p. 3-50 - 3-51)

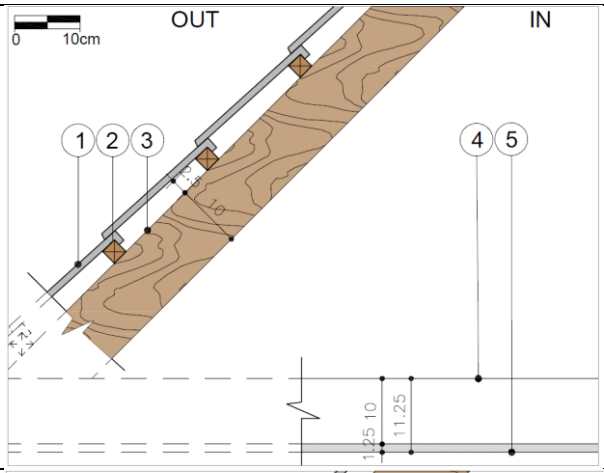
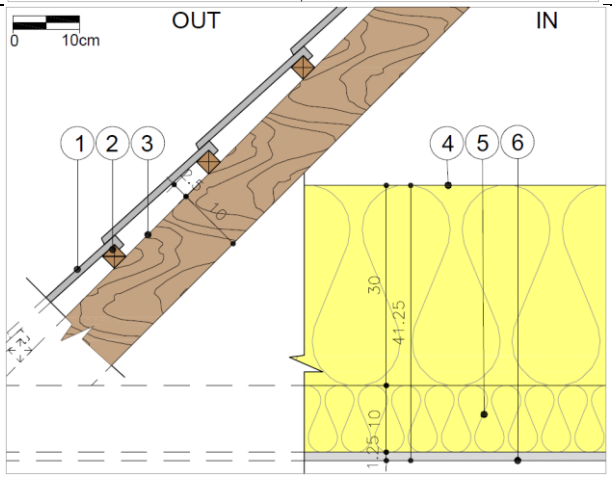
	Wall construction type (Thickness and layers)	U-value (W/m^{2}K)	Section
As-built	Non-insulated solid brick walls Total thickness: 233mm Layers from outside to inside: 1. 220mm solid brick 2. 13mm dense plaster	2.08	

Optimised	Externally insulated solid brick walls Total thickness: 473 mm Layers from outside to inside: 1. 10 mm basecoat/mesh/render 2. 230mm EWI Mineral wool 3. 220mm solid brick 4. 13mm dense plaster	0.16 (U-value (W/m^2K) (≤ 0.18)	

Roofs

Roof construction type (as-built and optimised) is illustrated in Table 25.

Table 25: Roof construction type – as-built and optimised, based on CIBSE (2019a, p. 3-54)

	Roof construction type (Thickness and layers)	U-value (W/m^2K)	Section
As-built	Non-insulated pitched roof Total thickness: 112.5mm Layers from outside to inside: 1. 20mm tiles (ventilated) 2. 25mm roof space – battens (ventilated) 3. - mm windtight barrier above the rafters 4. 100mm ceiling joists 5. 12.5mm plasterboard	2.24	
Optimised	Highly insulated pitched roof (insulated at ceiling level) Total thickness: 412.5mm Layers from outside to inside: 1. 20mm tiles (ventilated) 2. 25mm roof space – battens (ventilated) 3. - mm windtight barrier above the rafters 4. 300mm mineral wool over ceiling joists 5. 100mm mineral wool between 100mm ceiling joists 6. 12.5mm plasterboard	0.10 (U-value (W/m^2K) (≤ 0.11)	

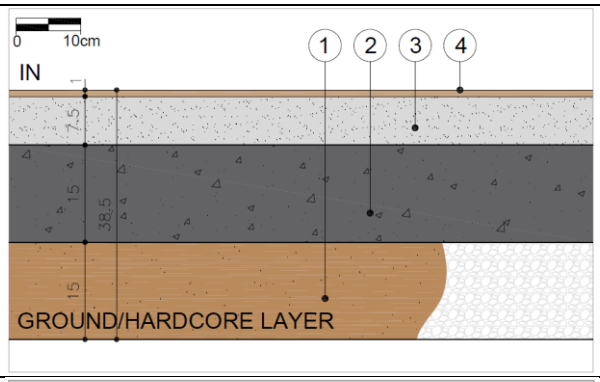
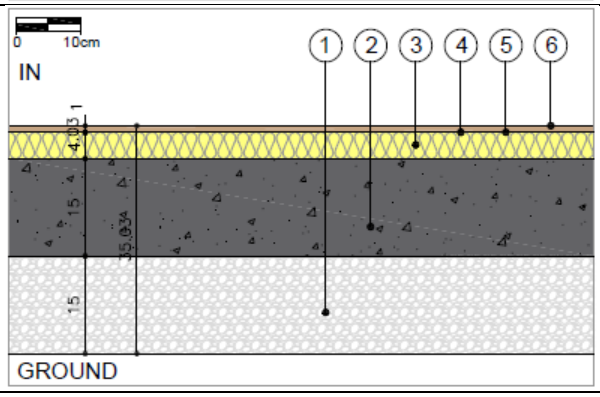
Floors

Ideally, proposed improvements to solid floors would aim to comply with Part L 2021 notional building (Ministry of Housing; Communities and Local Government, 2021), which specifies a U-value of 0.13W/m²K or less. However, this may necessitate a full rebuild, resulting in higher costs and

significant disruption to occupants. For this reason, a more feasible alternative was selected for simulations under the deep retrofit approach. Consequently, a high-performance aerogel insulation mat with a low thermal conductivity of 0.015 W/mK was chosen for the thermal upgrade of solid floors. This slim insulation mat can be placed over a solid concrete floor, conserving interior space, and offering a less disruptive option compared to full rebuilding (Thermablok, 2023).

Ground floor construction type (as-built and optimised) is illustrated in Table 26.

Table 26: Floor construction type – as-built and optimised, based on CIBSE (2019a, p. 3-55 - 3-56)

	Floor construction type (Thickness and layers)	U-value (W/m^2K)	Section
As-built	Non-insulated solid floor Total thickness: 235mm Layers from outside to inside: 1. Ground/Hardcore Layer 2. 150mm cast concrete 3. 75mm screed 4. 10mm carpet	1.59	
Optimised	Highly insulated solid floor-Aerogel insulation mat Layers from outside to inside: 1. Ground/Hardcore Layer 2. 150mm cast concrete 3. 40mm Aerogel insulation mat 4. 3mm high-density untreated chipboard 5. Damp-proof membrane 6. 10mm carpet	0.30 (U-value (W/m^2K) (> 0.13)	

Glazing and doors

Proposed improvements to glazing and doors aimed to comply with Part L2021 notional building (Ministry of Housing; Communities and Local Government, 2021) and should be smaller than or equal to 1.20 (6+12+6+12+6mm, 0.98 W/m^2K) and 1.00W/m^2K, respectively.

2.3 Retrofit Stage 1: Building Fabric Optimisation

Typical building fabrics were initially examined across each archetype (as described in Section 1.8) to explore the achieved heating energy demands. Following this, a series of simulations were conducted to measure the energy efficiency resulting from cumulative changes in the fabric. These changes aimed to reach the notional levels of Part L 2021, considering a deep retrofit approach. Additionally, a typical retrofit approach was adopted that excluded the more costly and disruptive strategies (as explained in Table 20). The purpose of this investigation was to determine the extent to which energy demand can be reduced by optimising the building fabric. This stage of assessment only involved improved fabric energy efficiency and airtightness levels. There were no active system improvements such as the use of ASHP.

The results, analysed per archetype, are shown in Figure 10-Figure 15.

Detached house

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 107 kWh/m². Following the implementation of a series of retrofit measures based on Part L notional levels, the heating demand was reduced to 20 kWh/m², marking an overall reduction of 81%. It is noted that loft insulation only resulted in a 5% decrease in heating demand compared to the base case, while solid floor insulation reduced the demand by 7% in scenario 3, compared to scenario 2.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 47% compared to the previous scenario. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 7% improvement in comparison to the previous scenario, due to a significant improvement in the U-values. However, it is important to note that implementing this measure is both costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 10%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 5% reduction.

Typical retrofit

- The initial heating demand was estimated to be 107 kWh/m². After implementing a series of typical retrofit measures, the heating demand was reduced to 42 kWh/m², representing a significant reduction of 61%.
- According to the results presented in Figure 10, loft insulation only reduced the heating demand by 5% in scenario 2 compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 45% in scenario 3, compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 8%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an additional 3%.

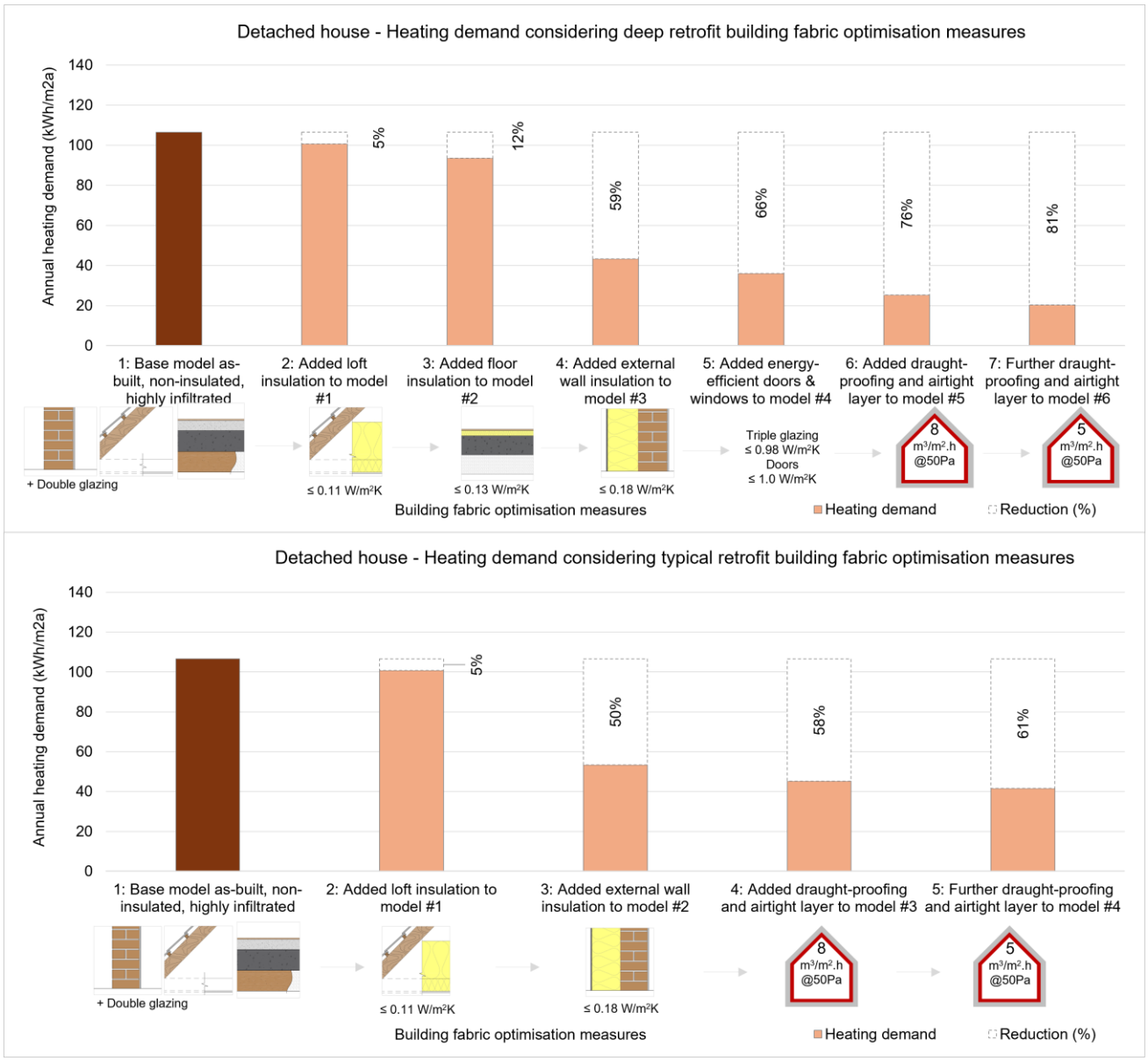


Figure 10: Deep & typical retrofit fabric measures – Detached house

Semi-detached house

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 87 kWh/m². Following the implementation of all the fabric retrofit measures based on Part L notional levels, the heating demand was reduced to 15 kWh/m², marking a substantial overall reduction of 83%. It is noteworthy that loft insulation resulted in a 9% decrease in heating demand compared to the base case, while solid floor insulation reduced the demand by 10% in scenario 3 when compared to scenario 2.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 40% compared to the previous strategy. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 9% improvement in comparison to the previous strategy due to a significant improvement in the U-values. However, it is important to note that implementing this measure is both costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 11%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 4% reduction.

Typical retrofit

- The initial heating demand was estimated to be 87 kWh/m². After implementing a series of typical retrofit measures, the heating demand was reduced to 37 kWh/m², representing a significant reduction of 58%.
- According to the results presented in Figure 11, loft insulation only reduced the heating demand by 9% in scenario 2, compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 38% in scenario 3 compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 8%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an extra 3% reduction.

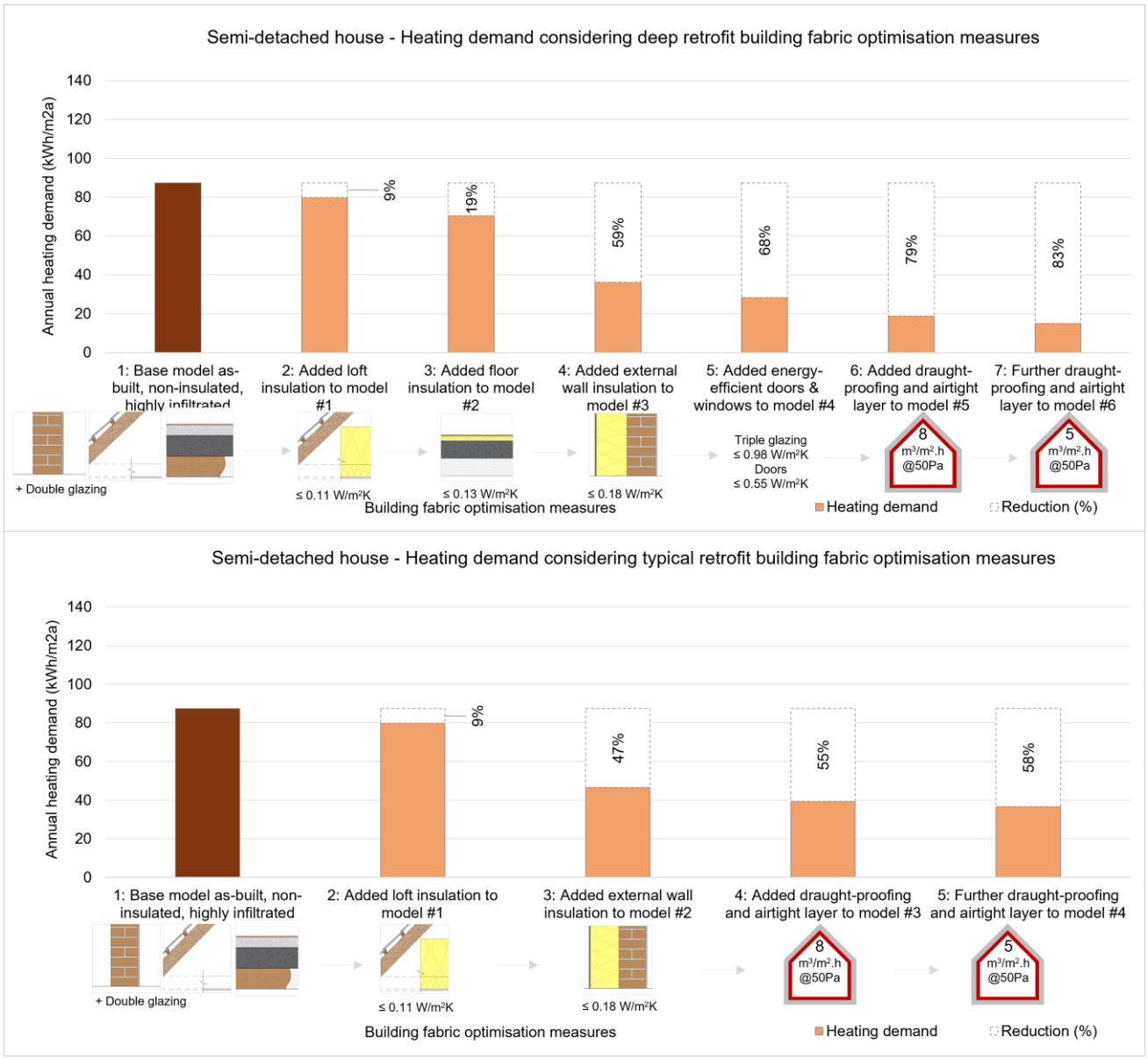


Figure 11: Deep & typical retrofit fabric measures – Semi-detached house

Mid-terrace house

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 125 kWh/m². Following the implementation of all deep retrofit measures based on Part L notional levels, the heating demand was reduced to 17 kWh/m², marking a reduction of 86%. It is noteworthy that loft insulation resulted in an 8% decrease in heating demand compared to the base case, while solid floor insulation reduced the demand by 14% in scenario 3 compared to scenario 2.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 42% compared to the previous strategy. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 9% improvement in comparison to the previous strategy due to a significant improvement in the U-values. However, it is important to note that implementing this measure can be costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 9%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 4% reduction.

Typical retrofit

- The initial heating demand was estimated to be 125 kWh/m². After implementing a series of typical retrofit measures, the heating demand was reduced to 37 kWh/m², representing a significant 70% reduction.
- According to the results presented in Figure 12, loft insulation only reduced the heating demand by 8% in scenario 2 compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 51% in scenario 3 compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 8%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an extra 3% reduction.

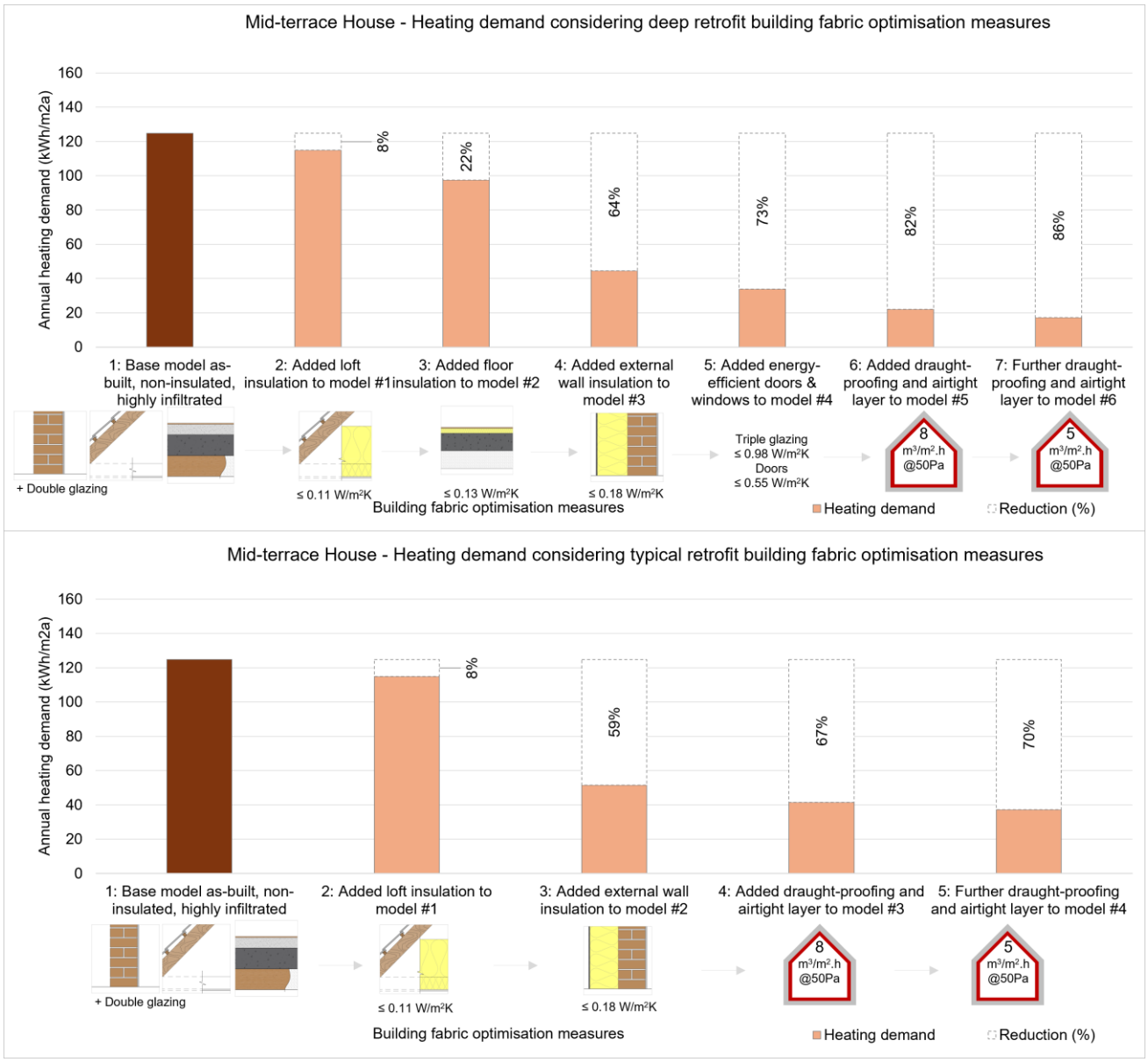


Figure 12: Deep & typical retrofit fabric measures – Mid-terrace house

End-terrace house

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 143 kWh/m². Following the implementation of the deep retrofit measures based on Part L notional levels, the heating demand was reduced to 20 kWh/m², marking an overall substantial 86% reduction. It is noteworthy that loft insulation resulted in a 5% decrease in heating demand, compared to the base case, while solid floor insulation reduced the demand by 11% in scenario 3, compared to scenario 2.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 51% compared to the previous strategy. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 7% improvement in comparison to the previous strategy due to a significant improvement in the U-values. However, it is important to note that implementing this measure can be costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 9%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 3% reduction.

Typical retrofit

- The initial heating demand was estimated to be 143 kWh/m². After implementing a series of typical retrofit measures, the heating demand was reduced to 44 kWh/m², representing a significant 70% reduction.
- According to the results presented in Figure 13, loft insulation only reduced the heating demand by 5% in scenario 2, compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 54% in scenario 3 when compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 7%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an additional 4% reduction.

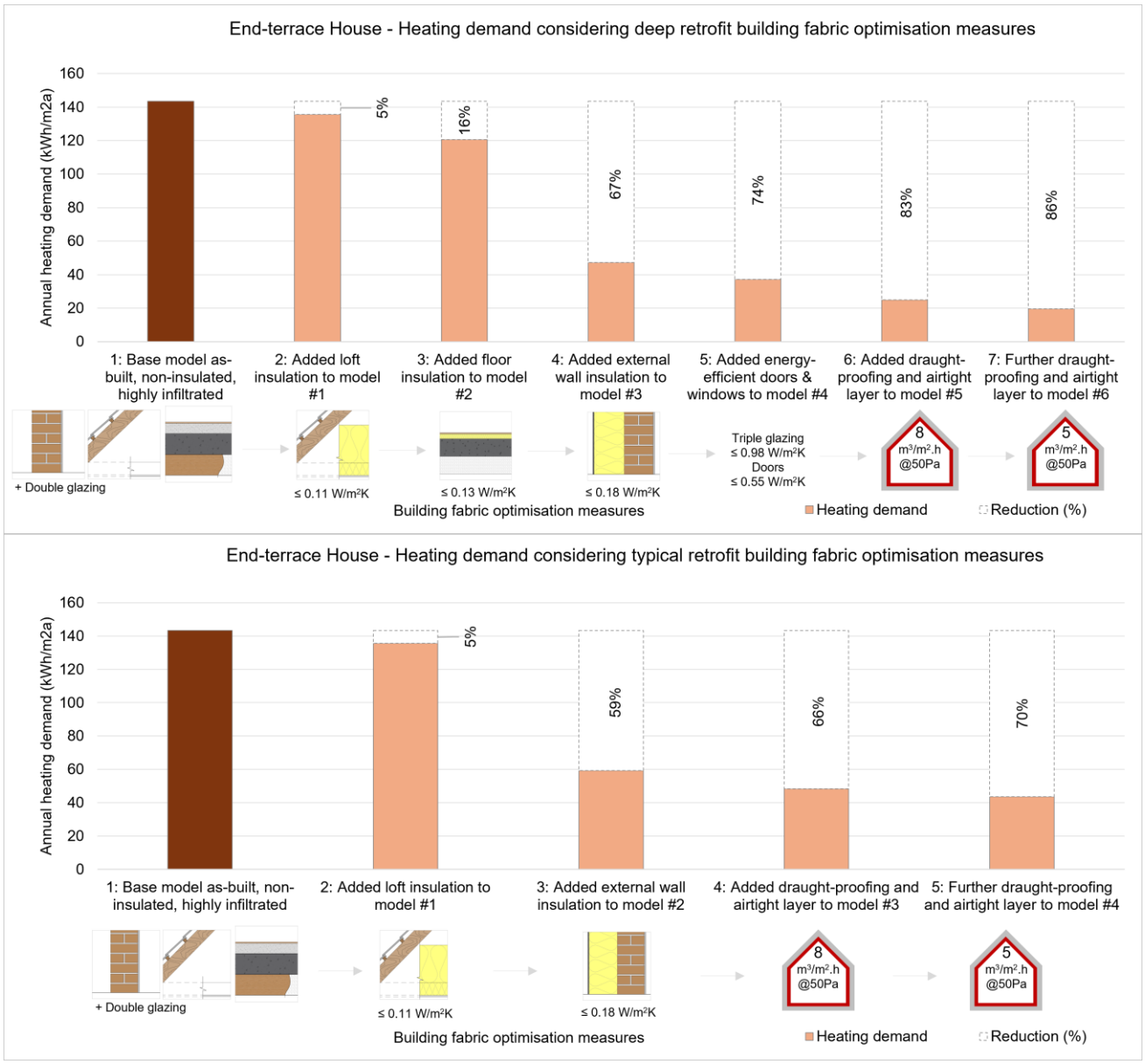


Figure 13: Deep & typical retrofit fabric measures – End terrace house

Flat- Mid-terrace

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 148 kWh/m². Following the implementation of a series of retrofit measures based on Part L notional levels, the heating demand was reduced to 29 kWh/m², marking an overall substantial 80% reduction. The simulation involved a Mid-terrace first-floor flat, and the use of loft insulation contributed significantly, resulting in a 16% decrease in heating demand compared to the base case.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 36% compared to the previous strategy. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 5% improvement in comparison to the previous strategy due to a significant improvement in the U-values. However, it is important to note that implementing this measure is both costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 16%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 7% reduction. This means that with all the deep retrofit measures in place, there was an overall 80% reduction in heating demand.

Typical retrofit

- The initial heating demand was estimated to be 148 kWh/m². After implementing a series of retrofit measures, the heating demand was reduced to 57 kWh/m², representing a significant 61% reduction.
- According to the results presented in Figure 14, loft insulation reduced the heating demand by 16% in scenario 2 compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 24% in scenario 3 compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 15%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an overall 61% reduction in heating demand, bringing it down to 57 kWh/m².

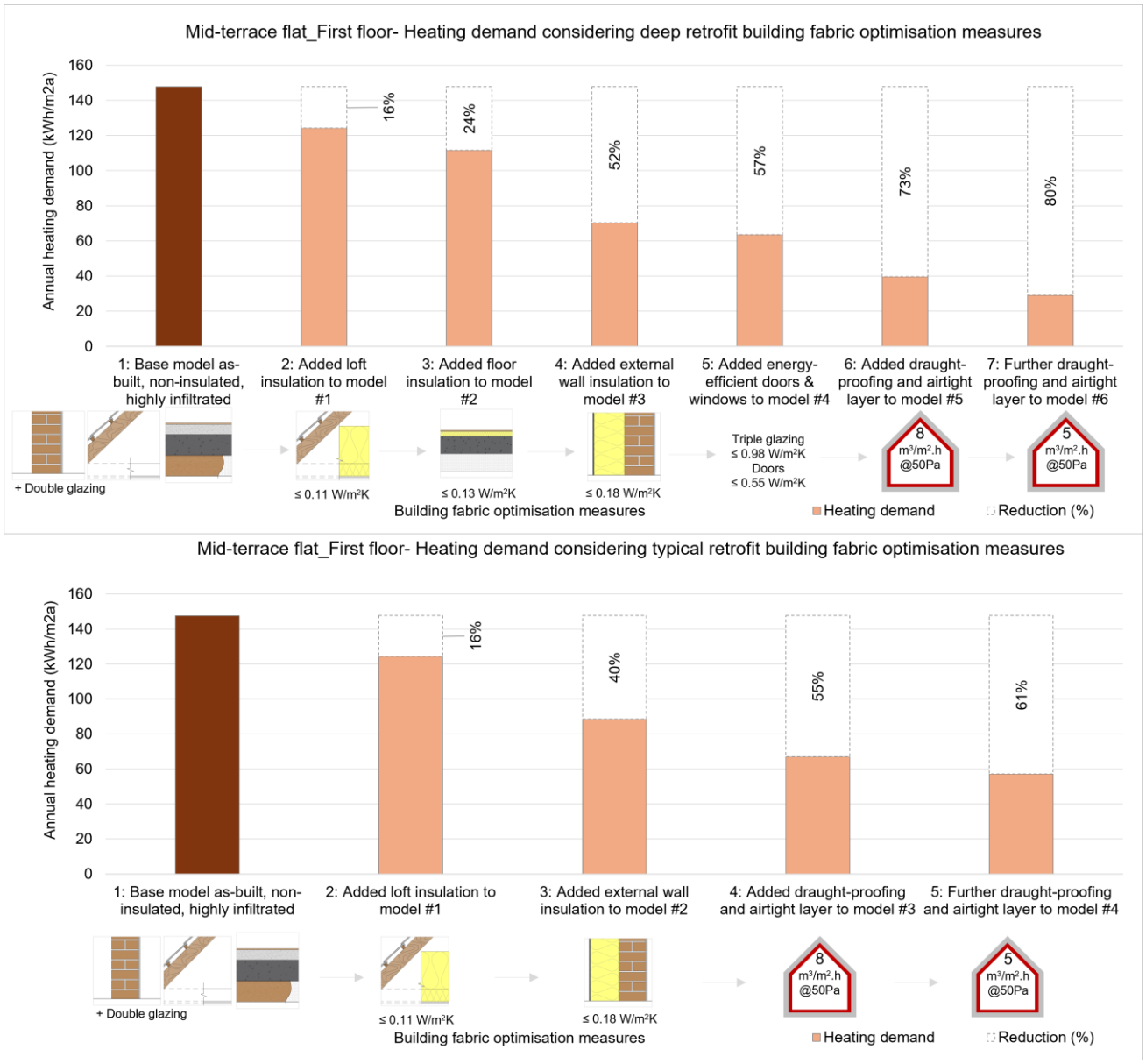


Figure 14: Deep & typical retrofit fabric measures – Flat- Mid-terrace

Flat- End-terrace

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 149 kWh/m². Following the implementation of a series of deep retrofit measures based on Part L notional levels, the heating demand was reduced to 29 kWh/m², representing a substantial 81% reduction overall. The simulation involved an end-terrace ground floor flat, and the use of solid floor insulation contributed significantly to a 25% reduction in demand in scenario 3.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 33% compared to the previous strategy. This is due to its larger exposed envelope area compared to the other fabric elements.
- Replacing windows/doors by energy-efficient glazing and doors also proved beneficial, leading to an additional 5% improvement compared to the previous strategy due to a significant improvement in the U-values. However, it is important to note that implementing this measure is both costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 12%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 6% reduction.

Typical retrofit

- The initial heating demand was estimated to be 149 kWh/m². After implementing a series of typical retrofit measures, the heating demand was reduced to 72 kWh/m², representing a significant 52% reduction.
- The external wall insulation was found to be the most impactful measure, reducing the heating demand by 37% in scenario 3. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 10%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in a further 5% reduction.

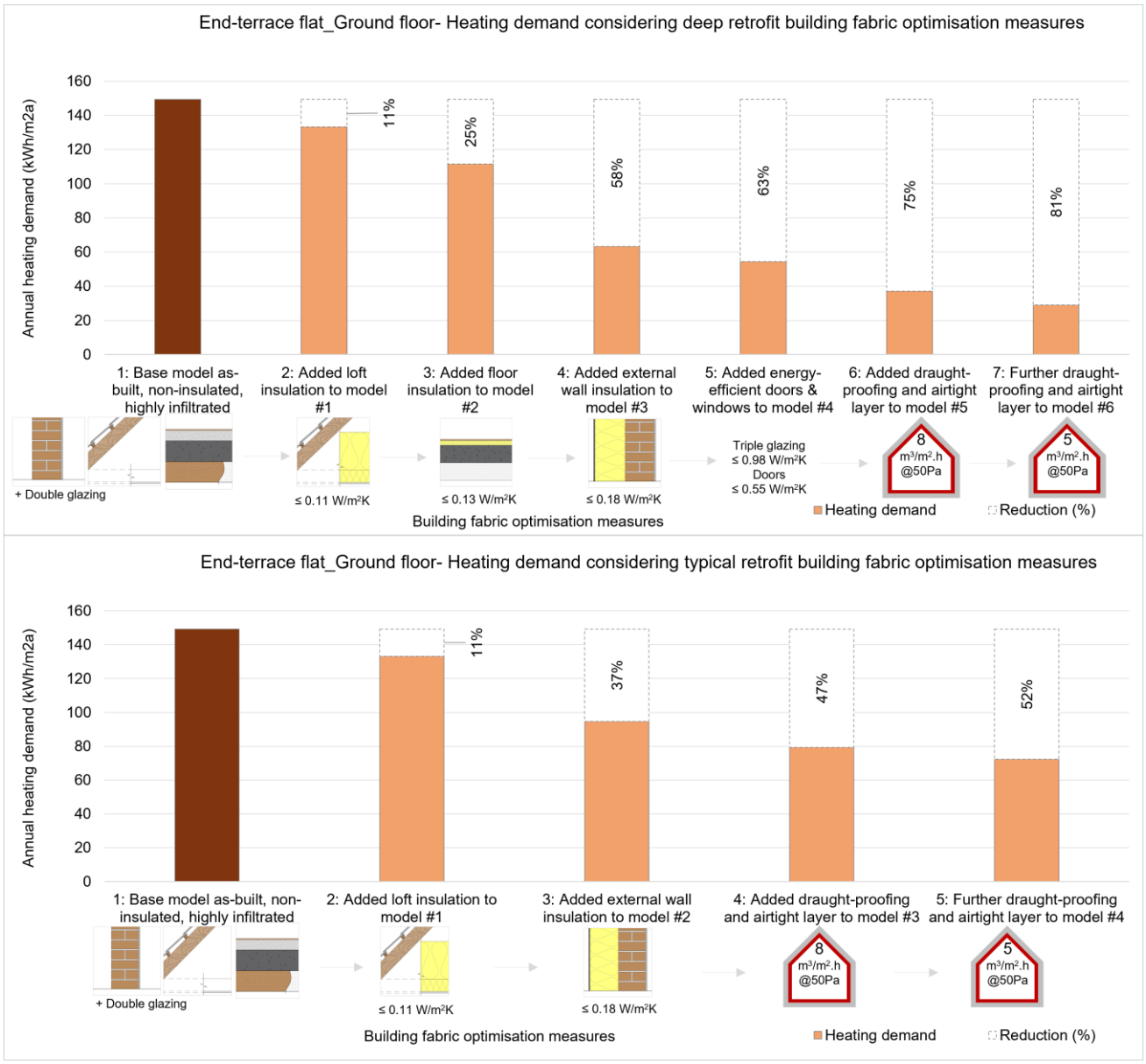


Figure 15: Deep & typical retrofit fabric measures – Flat- End-terrace

2.4 Retrofit Stage 2 & Stage 3: Low-Carbon Heating & Renewable Energy Generation

This section examines the simulated archetypes further to determine the energy and carbon impact achieved by the adoption of a low-carbon heating system compared to a typical gas heating baseline. This was achieved by adding an ASHP and solar photovoltaic (PV) panels to the model. One of the main aims was to better understand the stage of building fabric optimisation that is most beneficial to install an ASHP, i.e., conditions where ASHP performance is not diminished by low-quality fabric. Retrofit stages 2 and 3 were assessed on the deep retrofit and typical retrofit scenarios across all the archetypes.

For space heating and domestic hot water (DHW), typical gas boiler and ASHP heating systems were adopted for comparative purposes. Heating inputs were considered, as mentioned in Table 23, and DHW mean consumption was assumed as 112.2 litres/day for a two-person occupancy and 133 litres/day for a three-person occupancy (Hot water assumptions in the Home Energy Model: FHS assessment wrapper, 2023).

For the gas boiler, the seasonal efficiency was 0.89; the seasonal coefficient of performance (SCOP), which identifies how much kW of heat a system can generate for every kW of electricity, was 0.8; there was no ventilation heat recovery effectiveness. The ASHP in combination with radiators was considered as the central heating system. A realistic approach to the ASHP performance was implemented by varying the SCOP from 1.8 to 2.8 for space heating across different retrofit scenarios, with a SCOP of 1.8 assumed for a leaky building, and gradually increasing across the retrofit scenarios. Similarly, a varying ASHP SCOP from 1.5 to 2 was assumed for domestic hot water (Heat Pumps and UK's Decarbonisation, 2021 & Interim Heat Pump Performance Data Analysis Report, 2023). This means that for a well-insulated house with a well-installed ASHP, a typical SCOP for space heating would be 2.8 and the SCOP for water heating would be 2. This is because water heating requires a higher temperature to be achieved, upwards of a 45°C gain, and the ASHP is less efficient when delivering these higher temperatures (works at a maximum 50-55°C). Space heating can be operated with lower temperature gains, typically 30-35°C (ideal for underfloor heating).

A solar PV system was adopted for renewable energy generation. For simulation purposes, the number of solar panels (5 units) was considered the same across all the archetypes. The panel type was monocrystalline silicon, and the other specifications include a panel size of 2m², module nominal efficiency of 0.20, nominal cell temperature (NOCT) of 42°C, and temperature coefficient for module efficiency Pmax as -0.36%/°C (Jinko Solar, 2020). All the panels were inclined at 34° and oriented southwards.

The total energy demand was calculated by considering the energy needed to run the house over a year, based on space heating, electricity (lighting and appliances), and hot water inputs.

The total carbon emissions from heating were calculated using the Future Home Standard Fuel factors within the Home Energy Model (HEMFHS). The HEMFHS emissions factor for electricity used the Green Book Supplementary Guidance grid average consumption-based electricity emissions factors. These figures were generated by the DESNZ Dynamic Dispatch Model (DDM), which considers electricity supply and demand up to 2050. It was assumed that natural gas and electricity have carbon emission factors equivalent to 0.21 $kgCO_2e/kWh$ and 0.086 $kgCO_2e/kWh$ respectively (Fuel factors within the Home Energy Model: FHS assessment, 2023).

The comparative annual running costs of gas and low-carbon heating systems were calculated, considering the cumulative building fabric optimised changes targeting the Part L 2021 notional levels. For the cost analyses, the daily standing charge was considered for both gas and electricity.

This was based on the fact that the majority of the houses in the UK typically use both electricity (i.e., lighting and equipment) and gas (i.e., heating and cooking if not electrical) as energy sources. However, considering that the adoption of the ASHP will cease gas consumption in these households, a scenario was adopted accounting for the electricity daily standing charge only (considering that cooking will not be sourced by gas anymore).

The assumptions concerning the energy tariffs and carbon emissions factors are mentioned in Table 27. The energy tariffs are average and use direct debit payment as a reference (Ofgem, 2024). This was adopted as the current national energy prices have increased and follow an uptrend.

Table 27: Emissions and tariffs of the heating sources

Gas	Gas price cap (October 2024 to December 2024) (Ofgem, 2024)	0.06 GBP per kWh
	Gas daily standing charge (Ofgem, 2024)	0.31 GBP
	Natural gas carbon emission factor (HEM, 2023)	0.210 $kgCO_2e/kWh$
Electricity	Electricity price cap (October 2024–December 2024) (Ofgem, 2024)	0.24 GBP per kWh
	Electricity daily standing charge (Ofgem, 2024)	0.60 GBP
	Electricity grid carbon emission factor (HEM, 2023)	0.086 $kgCO_2e/kWh$

From 2025 the government plans to ban gas boilers for new homes as a measure to meet carbon neutral targets by 2050. This will make electric systems the only viable alternative to deliver heating and DHW demands in the residential sector. The Future Homes Standard (Ministry of Housing; Communities and Local Government, 2021) specification has been developed with this in mind, as heat pumps, the preferred option for single dwellings, require an environment where temperatures can be kept consistent, rather than requiring a rapid response. The ideal scenario is therefore an insulated and airtight indoor environment that can reduce overall and peak demand.

This rapid transition will in all likelihood take place in the new-build market. For the retrofit market, however, the approach taken here is to list the pros and cons of low-carbon heating systems to show why this is far less likely to be rolled out as a mainstream solution.

Pros:

- ASHPs will deliver a potentially carbon-neutral source of heating and DHW, dependent on the UK energy mix and the rate at which that decarbonises.
- ASHPs will reduce energy demand significantly due its COP of approximately 3, but energy bills are not necessarily reduced if not combined with PVs and a robust building fabric.
- The replacement of boilers by ASHP will generate many thousands of jobs for the region.

Cons:

- Each property will first have to be refurbished to Future Homes Standard or Part L 2021 notional levels in terms of thermal efficiency and airtightness, otherwise the risk of higher energy bills is likely to occur as electricity costs more than gas.
- The local electricity grid will, according to Western Power, require substantial and immediate investment to supply the electricity demand, which cannot be currently met.
- All gas boilers and radiators, irrespective of their age and efficiency would have to be removed, the embodied carbon footprint of which would need to be calculated and added to that of the manufacture of all replacement systems.
- The embodied energy of the gas central heating system being removed (7000$kgCO_2e$ plus radiators) plus that of an ASHP installation (1563 $kgCO_2e$) equates to approximately 10 years of carbon savings in a typical house complying with current regulations*.

- ASHPs costs nearly 15 thousand pounds are currently around three to four times the cost of a conventional gas boiler.
- The external space required, and the location of the water tank internally will create additional cost and disruption for many households.
- ASHPs cannot face each other on adjoining properties which would require alternative internal layouts on semi-detached units.
- The change in occupants' lifestyle necessitated by the adoption of a low-temperature heating system will by met with resistance, which could also impact overall efficiency.
- The risks associated with an unknown future climate and the likelihood of unprecedented cold weather spells have not been accounted for.
- Running a hot bath requires a quick response heat load that ASHPs cannot provide.
- The lack of a robust supply chain for manufacture and a skilled workforce for installing has yet to be addressed, currently resulting in excessive installation costs of up to 10x that of a gas boiler.
- (*total embodied carbon = 8563kgCO_2 (7000+1563) / energy saved = 3840kWh/yr (66% of 5760kWh/yr. / carbon emission due to gas energy saved = 806kgCO_2 (3840*0.21) / payback time = 10 years (8563/806).

The results, analysed by archetype, present the total annual energy demand and carbon emissions for both, deep retrofit and typical retrofit scenarios. These findings are represented in Figure 16 to Figure 27.

Detached house

Figure 16 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumed by gas boiler heating systems was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, energy consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 18 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 53% to 8.5 MWh. When renewable energy sources were added, the energy demand decreased further to 7 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 9MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 54%, reaching nearly 4.3MWh. Renewable energy further reduced the total annual energy consumption to 2.8 MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to an ASHP. As expected, the carbon emissions attributable to the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 3.4 tonnes CO_2/yr, reducing to 1.3 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 0.8 tonnes CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.2 tonnes CO_2/yr, equivalent to a 69% reduction. It is noteworthy that the external wall insulation of the fabric optimisation measures contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that simply switching to a low-carbon heating system without adopting any fabric measures led to a 76% decrease in carbon emissions, when compared to the emissions produced by gas heating systems. This shows that replacing fossil fuels-based systems with low-carbon heating, most likely ASHPs, in combination with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, it is crucial that fabric retrofit measures precede the installation of low-carbon alternatives to ensure consumer energy bills remain affordable and demand can be met. This reiterates the finding that the replacement of gas boilers should be considered following a certain degree of fabric improvement, therefore ensuring that occupants' quality of life is not negatively affected. ASHPs are most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

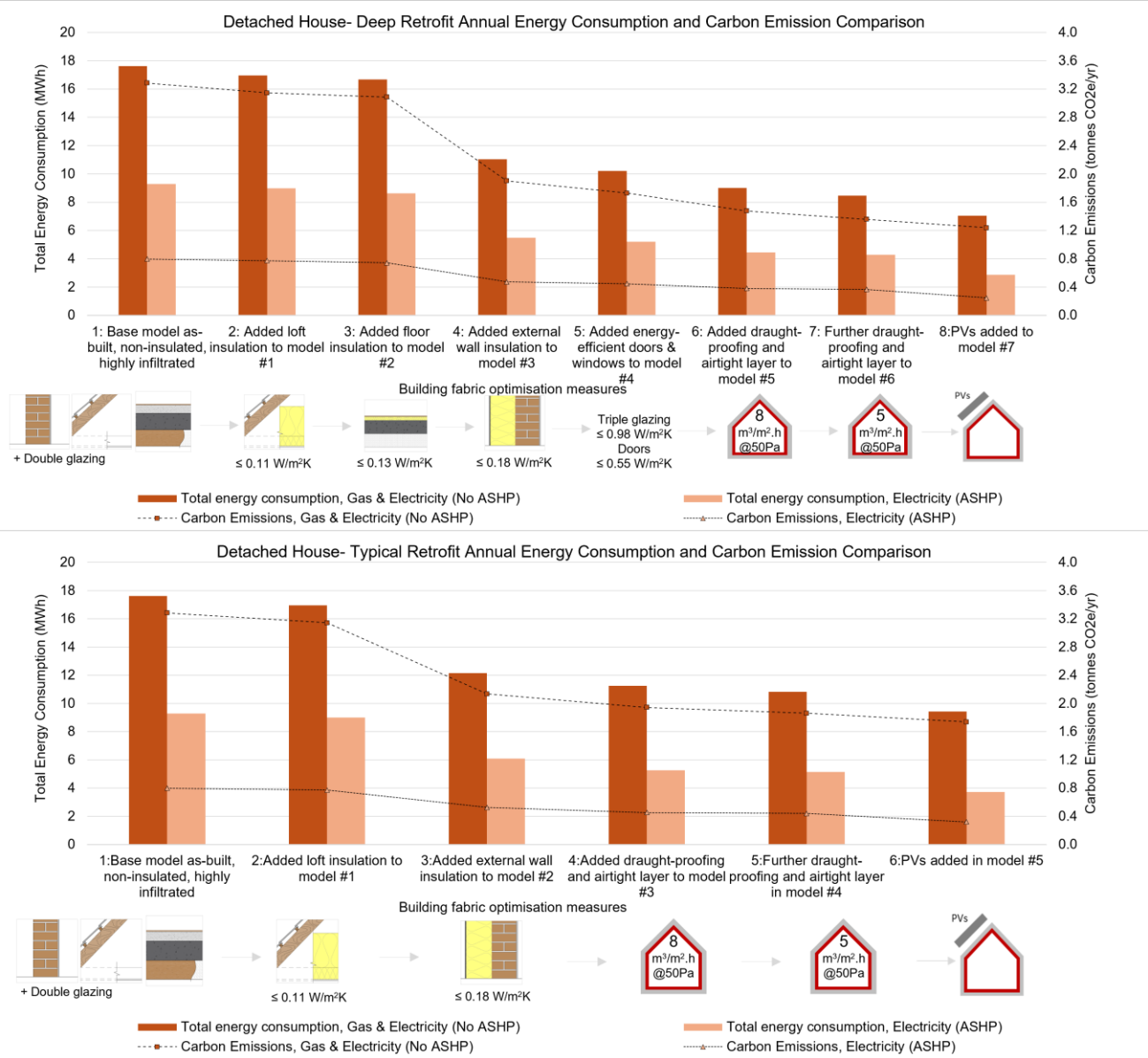


Figure 16: Deep & typical retrofits – heating systems annual energy demand & carbon emission – Detached

Annual running energy costs- Cap period October–December 2024

Figure 17 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 28% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 49% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 21% compared to the base case scenario.

Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 41% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. Additionally, the cost analyses comparing ASHP to gas heating systems for deep and typical retrofit scenarios indicated that the optimal stage to install an ASHP is after the adoption of wall insulation, i.e., Scenario 4 of deep retrofit and Scenario 3 of typical retrofit, thereby ensuring that the ASHP performance is not diminished by low-quality fabric.

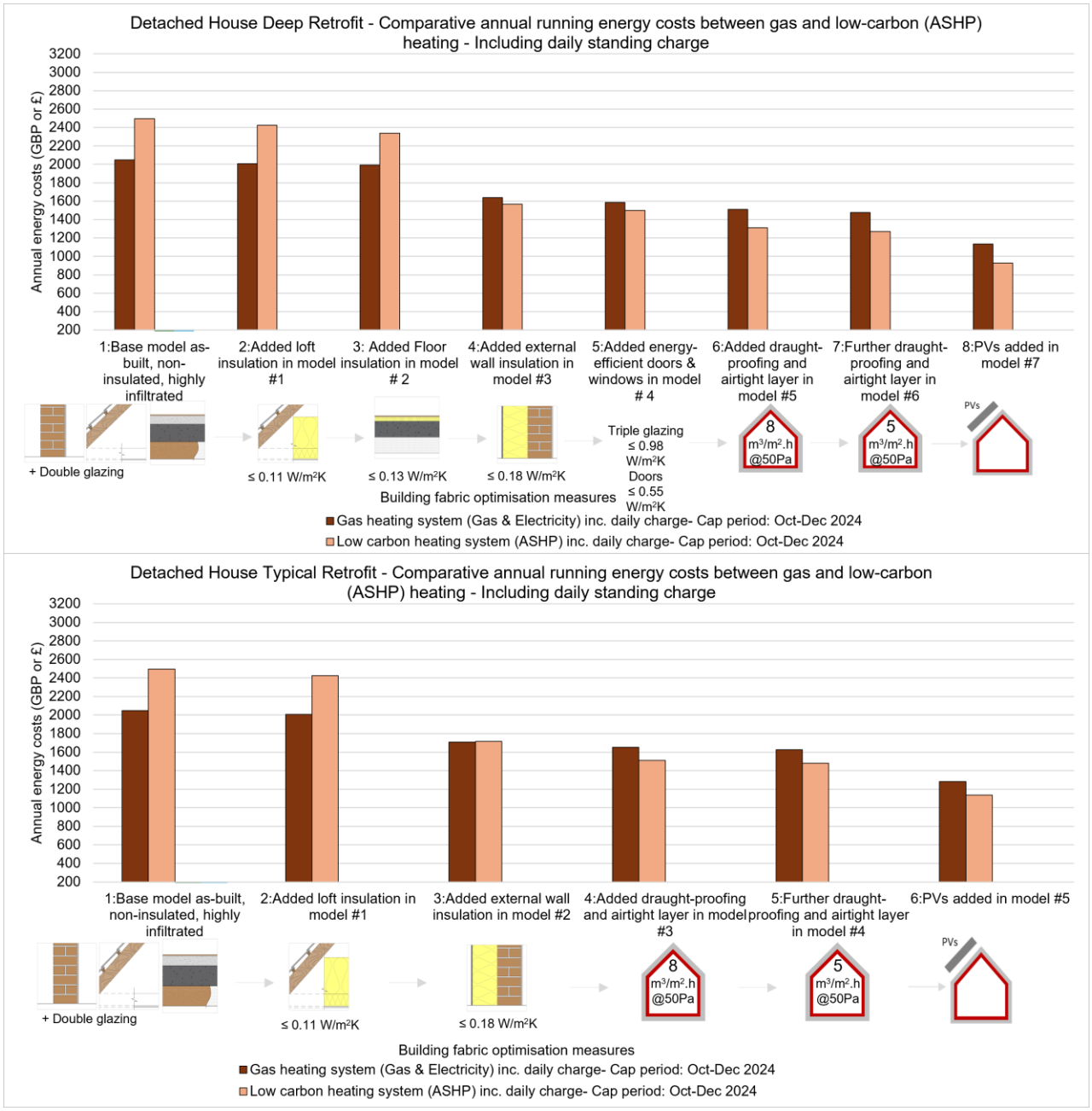


Figure 17: Deep & typical retrofits – heating systems annual costs – Detached

Semi-detached house

Figure 18 illustrates a comparison of simulation results for energy consumption and carbon emissions between an ASHP and conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumed by gas boiler heating systems was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, energy consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 16 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 48% to 8.7 MWh. When renewable energy sources were added, the energy demand decreased further to 7 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 8.3MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 51%, reaching nearly 4.1MWh. Renewable energy further reduced the total annual energy consumption to 2.7 MWh.

In terms of carbon emissions, a considerable difference in results was observed when considering a traditional gas boiler as a heating system compared to an ASHP. As expected, the carbon emissions with the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 3 tonnes CO_2/yr, reducing to 1.3 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting an ASHP, the carbon emissions corresponded to 0.7 tonnes CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.2 tonnes CO_2/yr, resulting in an overall reduction of carbon emissions by 68%. It is noteworthy that the external wall insulation of the fabric optimisation measures has contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that switching to a low-carbon heating system without adopting any fabric measures led to a significant 76% decrease in carbon emissions compared to the emissions produced by gas heating systems. This shows that by replacing fossil fuels with low-carbon heating, primarily ASHPs (ASHPs), along with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, fabric retrofit measures are necessary alongside this switch to ensure bills remain affordable, and power supplies and infrastructure can meet demand. This highlights the fact that gas boiler replacement by low-carbon heating systems should be considered when a certain degree of improvement has been carried out on the fabric. ASHP is most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

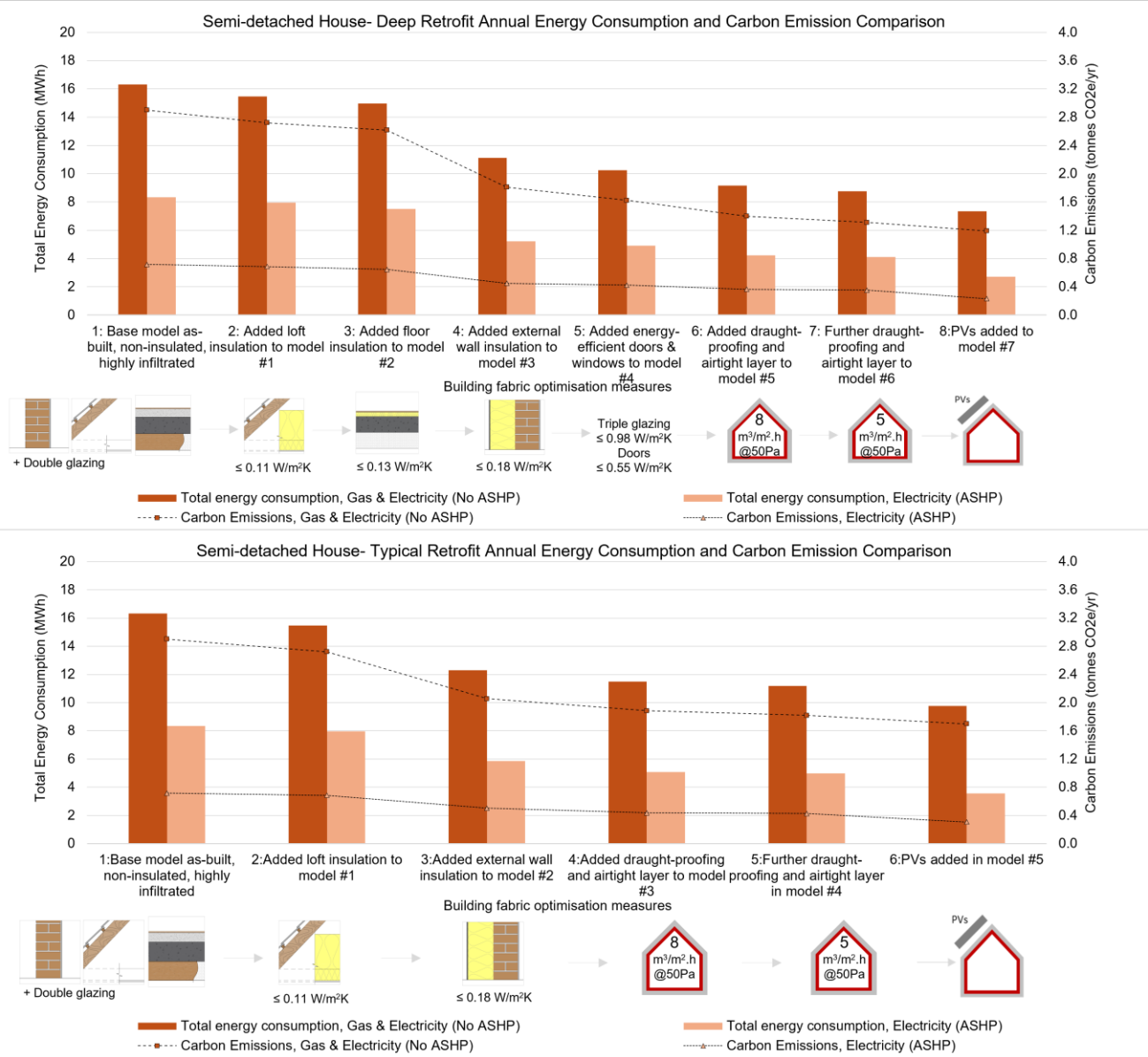


Figure 18: Deep & typical retrofits – heating systems annual energy demand & carbon emission – Semi-detached

Annual running energy costs- Cap period October–December 2024

Figure 19 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 22% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 46% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 15% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 36% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. Additionally, the cost analyses comparing ASHP to gas heating systems for deep and typical retrofit scenarios indicated that the optimal stage to install an ASHP is after the adoption of wall insulation, i.e., Scenario 4 of deep retrofit and Scenario 3 of typical retrofit, thereby ensuring that the ASHP performance is not diminished by low-quality fabric.

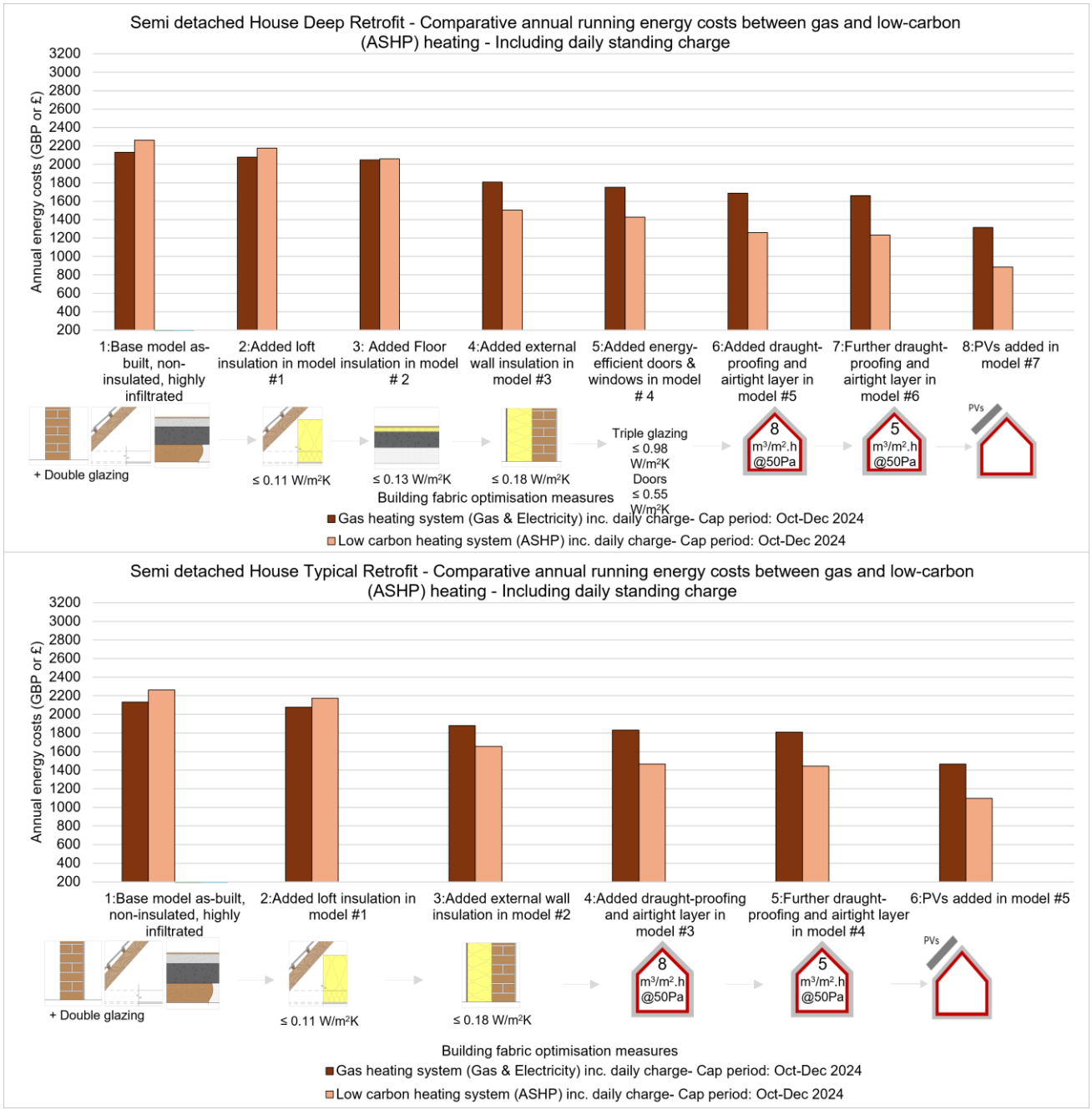


Figure 19: Deep & typical retrofits – heating systems annual costs – Semi-detached

Mid-terrace house

Figure 20 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumption from using a gas boiler for heating was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, the consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 20 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 58% to 8.7 MWh. When renewable energy sources were added, the energy demand further decreased to 7 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 11 MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 53%, reaching nearly 5.3MWh. Renewable energy further reduced the total annual energy consumption to 4 MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to ASHP. As expected, the carbon emissions with the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 4 tonnes CO_2/yr, reducing to 1.4 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 0.9 tonnes CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.3 tonnes CO_2/yr, resulting in an overall reduction of carbon emissions by 65%. It is noteworthy that the external wall insulation of the fabric optimisation measures has contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that just switching to a low-carbon heating system without adopting any fabric measures led to a significant 75% decrease in carbon emissions compared to the emissions produced by gas heating systems. This shows that by replacing fossil fuels with low-carbon heating, primarily ASHPs (ASHPs), along with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, fabric retrofit measures are necessary alongside this switch to ensure bills remain affordable, and power supplies and infrastructure can meet demand. This highlights the fact that gas boiler replacement by low-carbon heating systems should be considered when a certain degree of improvement has been carried out on the fabric. ASHP is most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

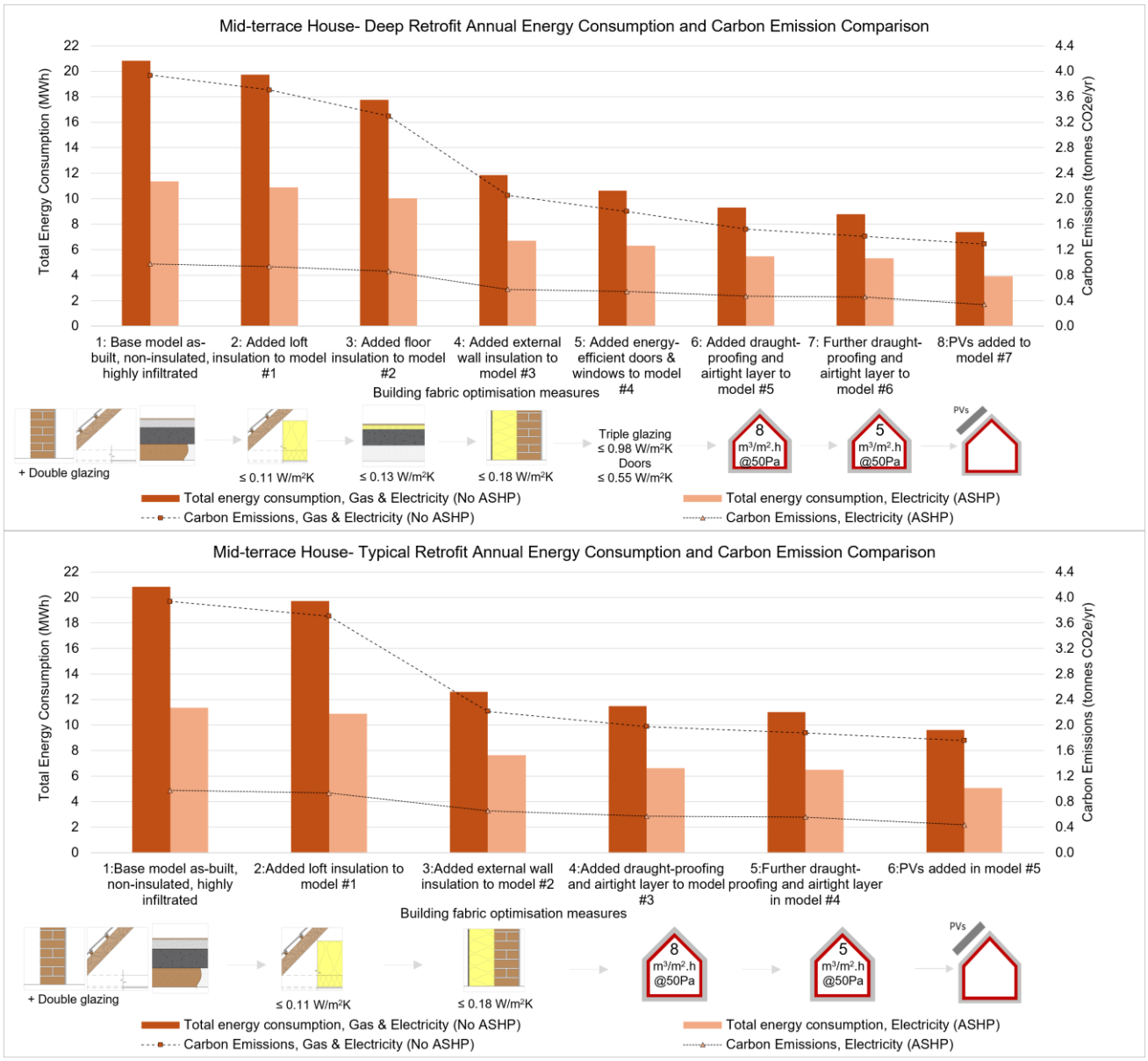


Figure 20: Deep & typical retrofits – heating systems annual energy demand & carbon emission – Mid-terrace House

Annual running energy costs- Cap period October–December 2024

Figure 21 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 33% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 49% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 27% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 40% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. However, the cost analyses across all the retrofit scenarios suggested that adopting ASHP had marginally higher annual energy costs than the traditional gas heating system.

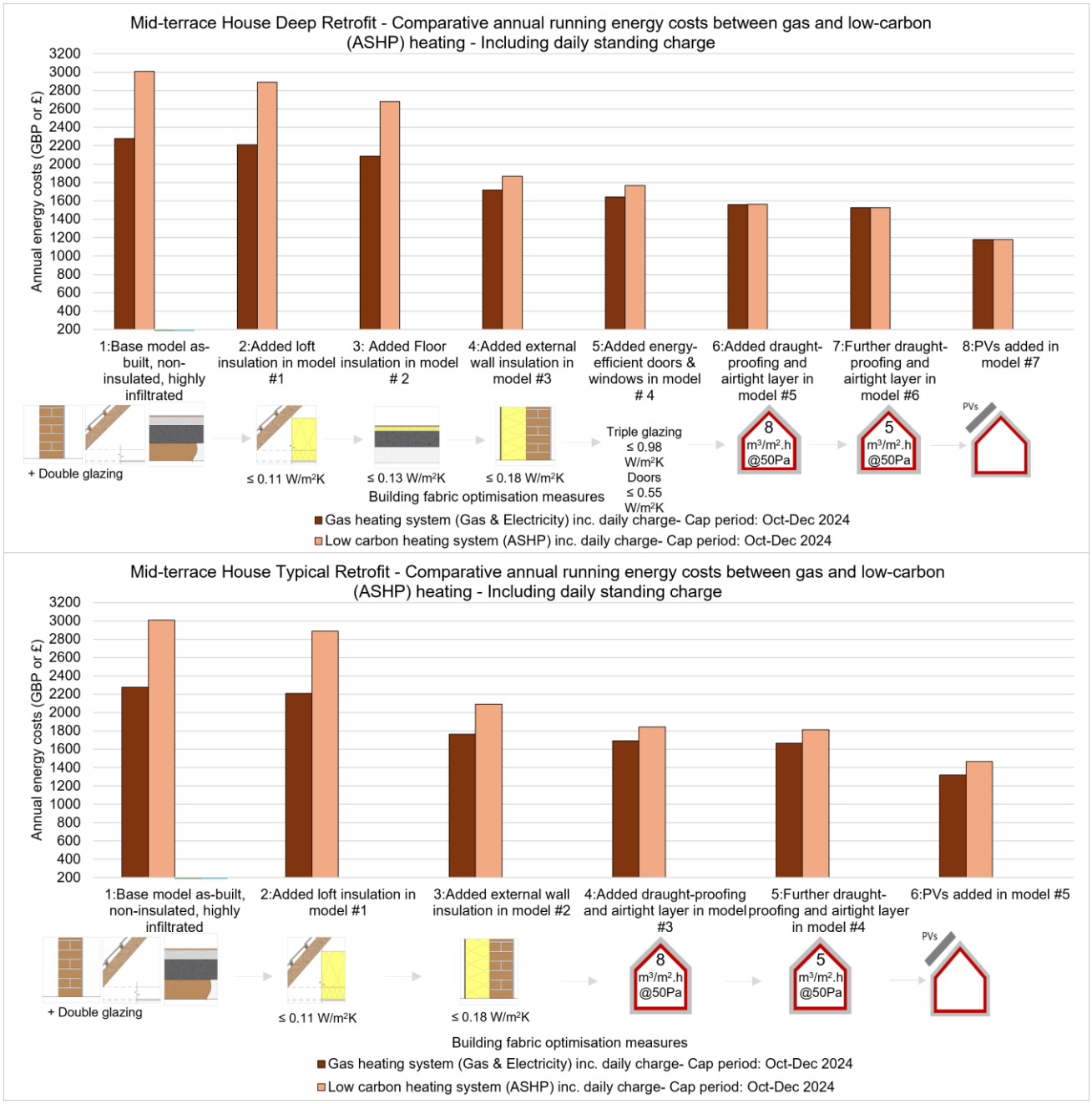


Figure 21: Deep & typical retrofits – heating systems annual costs – Mid-terrace House

End-terrace house

Figure 22 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumption from using a gas boiler for heating was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, the consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 23 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 61% to 9 MWh. When renewable energy sources were added, the energy demand further decreased to 7.6 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 12 MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 56%, reaching nearly 5.4MWh. Renewable energy further reduced the total annual energy consumption to 4 MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to ASHP. As expected, the carbon emissions with the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 4 tonnes CO_2/yr, reducing to 1.4 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 1 tonne CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.3 tonnes CO_2/yr, resulting in an overall reduction of carbon emissions by 67%. It is noteworthy that the external wall insulation of the fabric optimisation measures has contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that just switching to a low-carbon heating system without adopting any fabric measures led to a significant 76% decrease in carbon emissions compared to the emissions produced by gas heating systems. This shows that by replacing fossil fuels with low-carbon heating, primarily ASHPs (ASHPs), along with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, fabric retrofit measures are necessary alongside this switch to ensure bills remain affordable, and power supplies and infrastructure can meet demand. This highlights the fact that gas boiler replacement by low-carbon heating systems should be considered when a certain degree of improvement has been carried out on the fabric. ASHP is most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

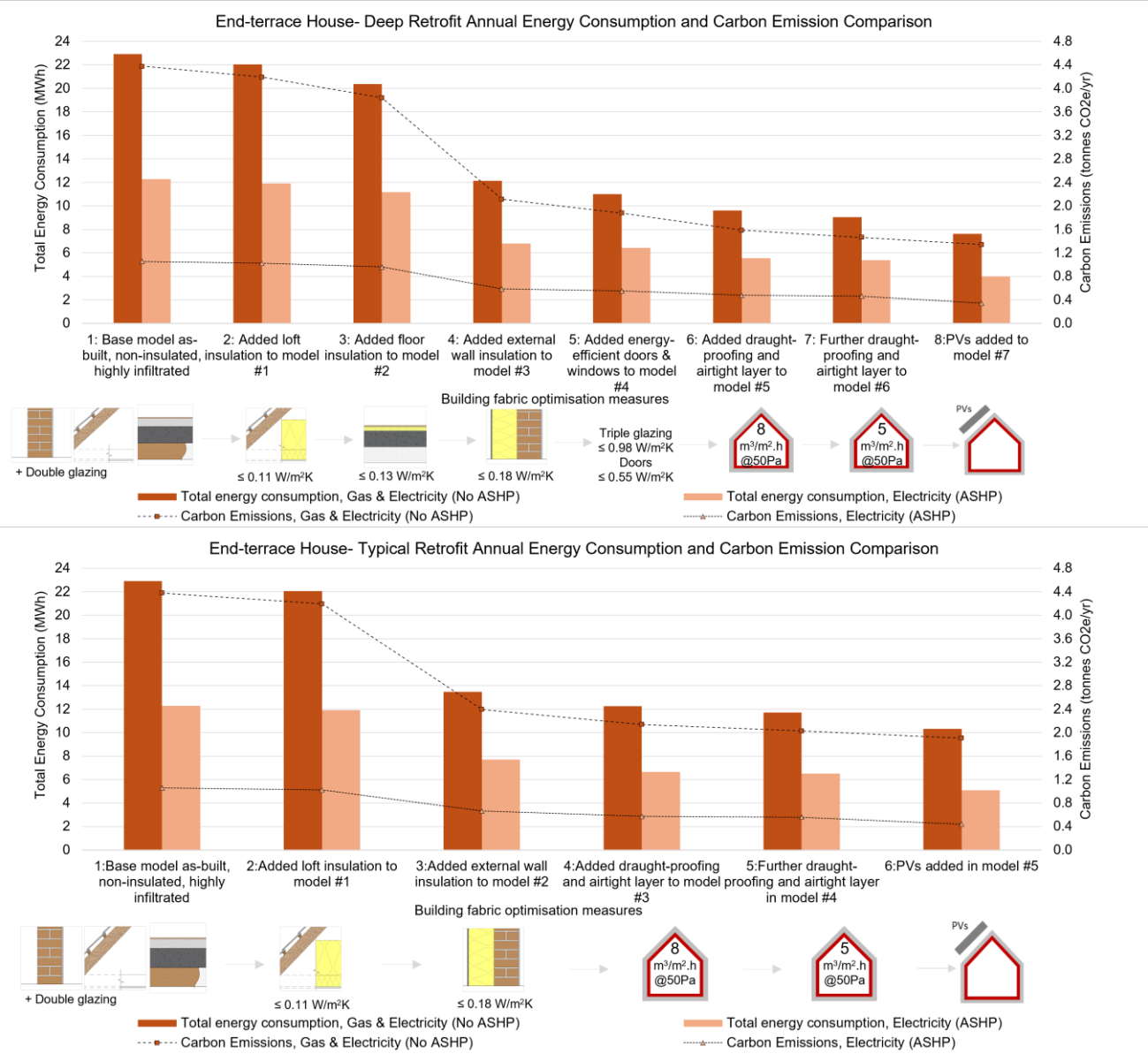


Figure 22: Deep & typical retrofits – heating systems annual energy demand & carbon emission – End-terrace House

Annual running energy costs- Cap period October–December 2024

Figure 23 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 36% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 52% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 29% compared to the base case scenario.

Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 44% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. However, the cost analyses across all the retrofit scenarios suggested that adopting ASHP had marginally higher annual energy costs than the traditional gas heating system.

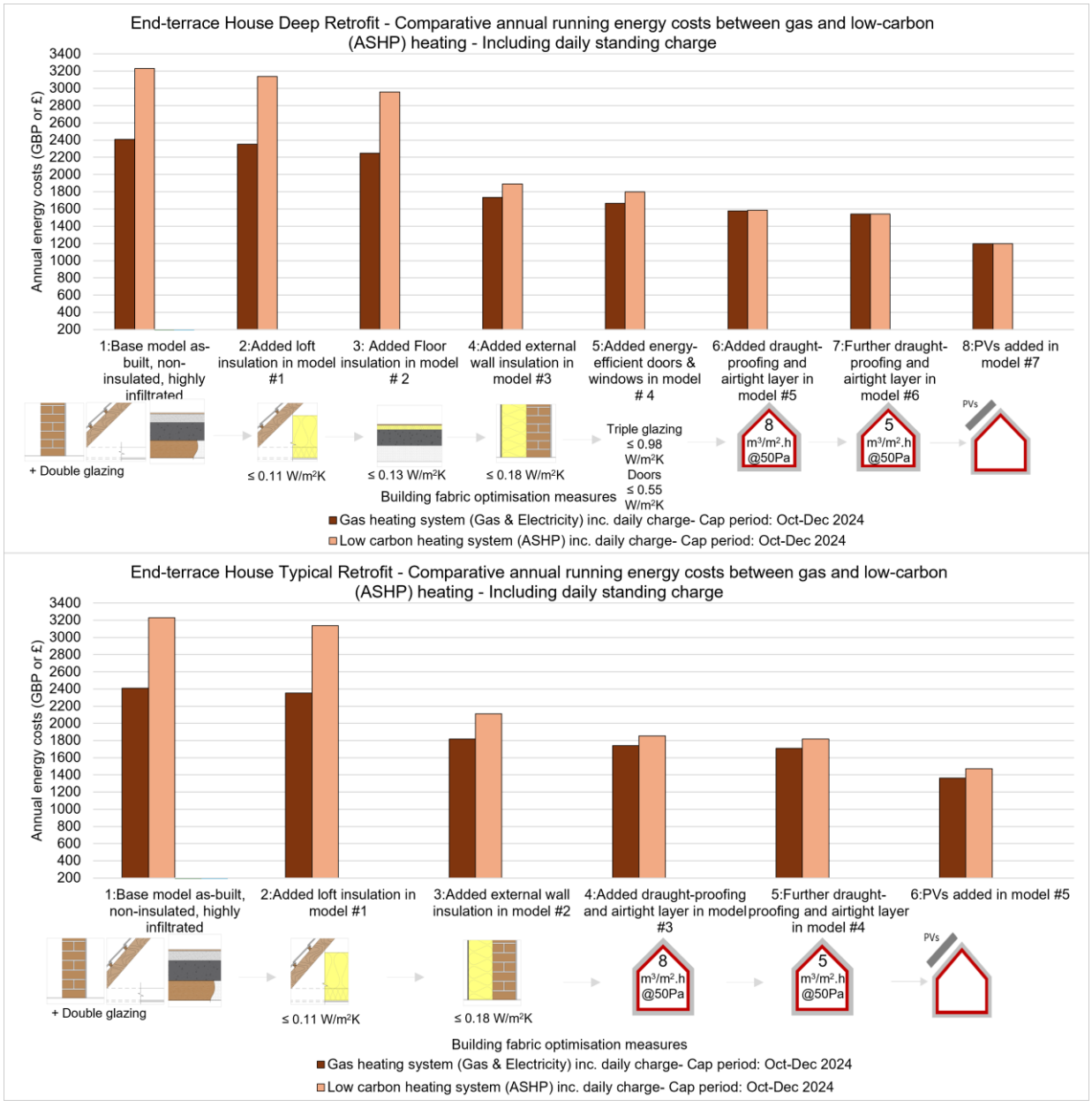


Figure 23: Deep & typical retrofits – heating systems annual costs – End-terrace House

Flat - Mid-terrace

Figure 24 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumption from using a gas boiler for heating was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, the consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 15 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 51% to 7.3 MWh. When renewable energy sources were added, the energy demand further decreased to 6 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 7.5 MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 53%, reaching nearly 3.5MWh. Renewable energy further reduced the total annual energy consumption to 2.1 MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to ASHP. As expected, the carbon emissions with the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 2.8 tonnes CO_2/yr, reducing to 1.2 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 0.6 tonnes CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.2 tonnes CO_2/yr, resulting in an overall reduction of carbon emissions by 72%. It is noteworthy that the external wall insulation of the fabric optimisation measures has contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that just switching to a low-carbon heating system without adopting any fabric measures led to a significant 77% decrease in carbon emissions compared to the emissions produced by gas heating systems. This shows that by replacing fossil fuels with low-carbon heating, primarily ASHPs (ASHPs), along with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, fabric retrofit measures are necessary alongside this switch to ensure bills remain affordable, and power supplies and infrastructure can meet demand. This highlights the fact that gas boiler replacement by low-carbon heating systems should be considered when a certain degree of improvement has been carried out on the fabric. ASHP is most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

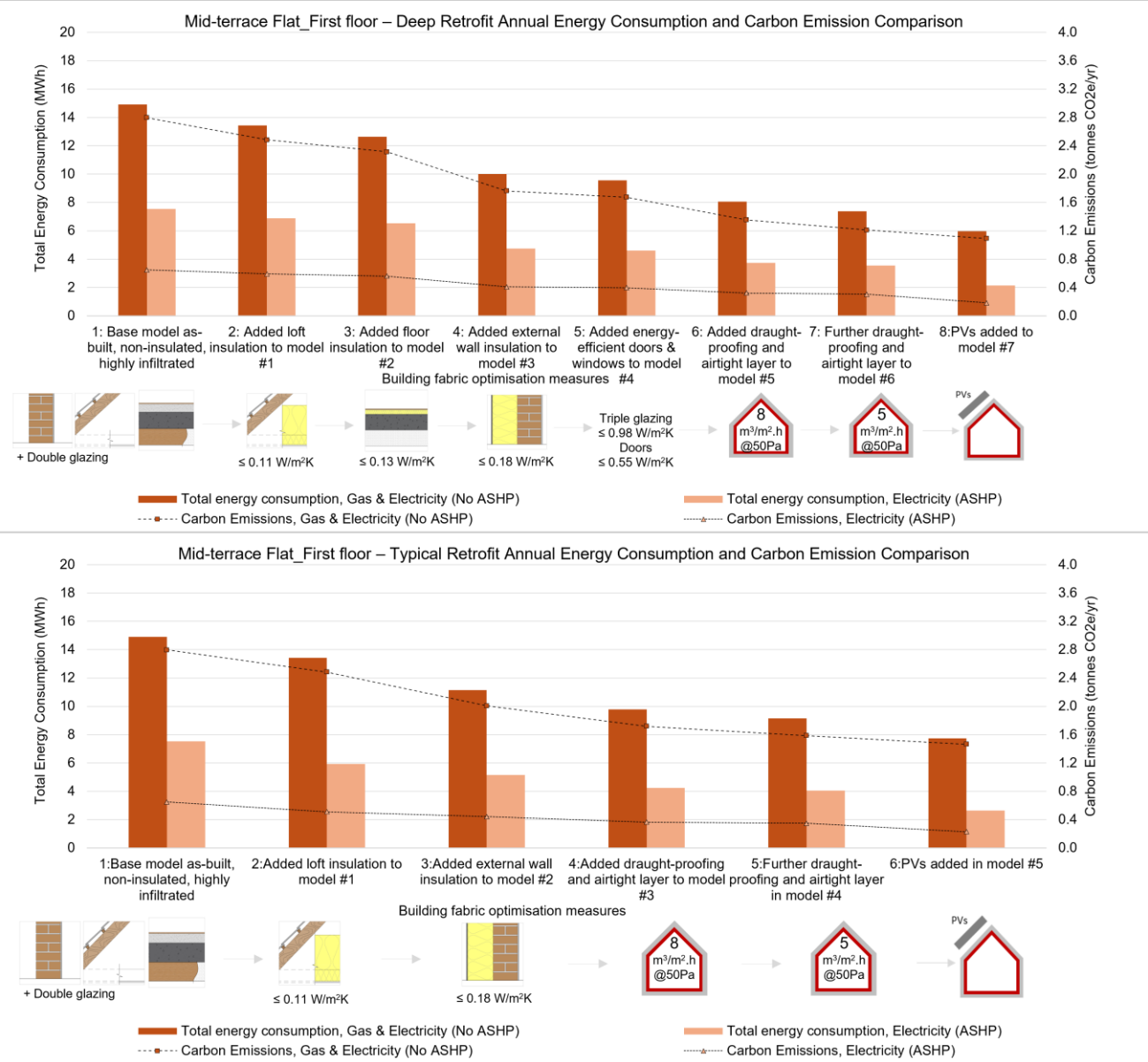


Figure 24: Deep & typical retrofits – heating systems annual energy demand & carbon emission – Mid-terrace Flat

Annual running energy costs- Cap period October–December 2024

Figure 25 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 27% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 47% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 20% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 41% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. Additionally, the cost analyses comparing ASHP to gas heating systems for deep and typical retrofit scenarios indicated that the optimal stage to install an ASHP is after the adoption of wall insulation, i.e., Scenario 4 of deep retrofit and Scenario 3 of typical retrofit, thereby ensuring that the ASHP performance is not diminished by low-quality fabric.

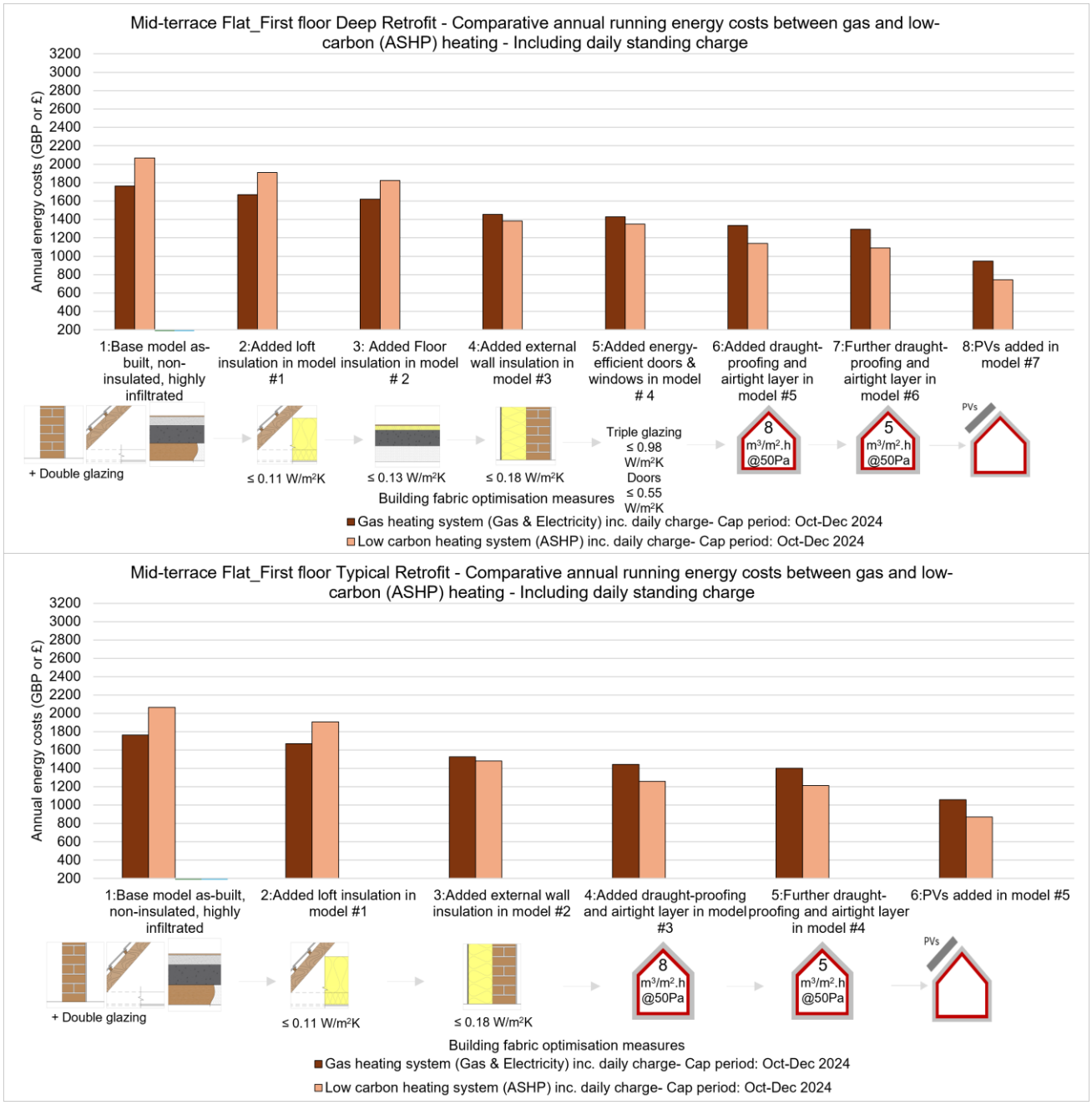


Figure 25: Deep & typical retrofits – heating systems annual costs – Mid-terrace Flat

Flat - End-terrace

Figure 26 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumption from using a gas boiler for heating was much higher in leaky, non-insulated buildings. However, when fabric optimisation measures were considered, the consumption was significantly reduced. In the initial, as-built scenario, the total annual energy consumption (including gas and electricity) was 17 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 54% to 7.8 MWh. When renewable energy sources were added, the energy demand further decreased to 6.4 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 8.5 MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 57%, reaching nearly 3.7MWh. Renewable energy further reduced the total annual energy consumption to 2.3 MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to ASHP. As expected, the carbon emissions with the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 3.2 tonnes CO_2/yr, reducing to 1.3 tonnes CO_2/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 0.7 tonnes CO_2/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0.2 tonnes CO_2/yr, resulting in an overall reduction of carbon emissions by 73%. It is noteworthy that the external wall insulation of the fabric optimisation measures has contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that just switching to a low-carbon heating system without adopting any fabric measures led to a significant 77% decrease in carbon emissions compared to the emissions produced by gas heating systems. This shows that by replacing fossil fuels with low-carbon heating, primarily ASHPs (ASHPs), along with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, fabric retrofit measures are necessary alongside this switch to ensure bills remain affordable, and power supplies and infrastructure can meet demand. This highlights the fact that gas boiler replacement by low-carbon heating systems should be considered when a certain degree of improvement has been carried out on the fabric. ASHP is most suited to installation in better-insulated, quality-built homes that demand lower heat output due to its operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

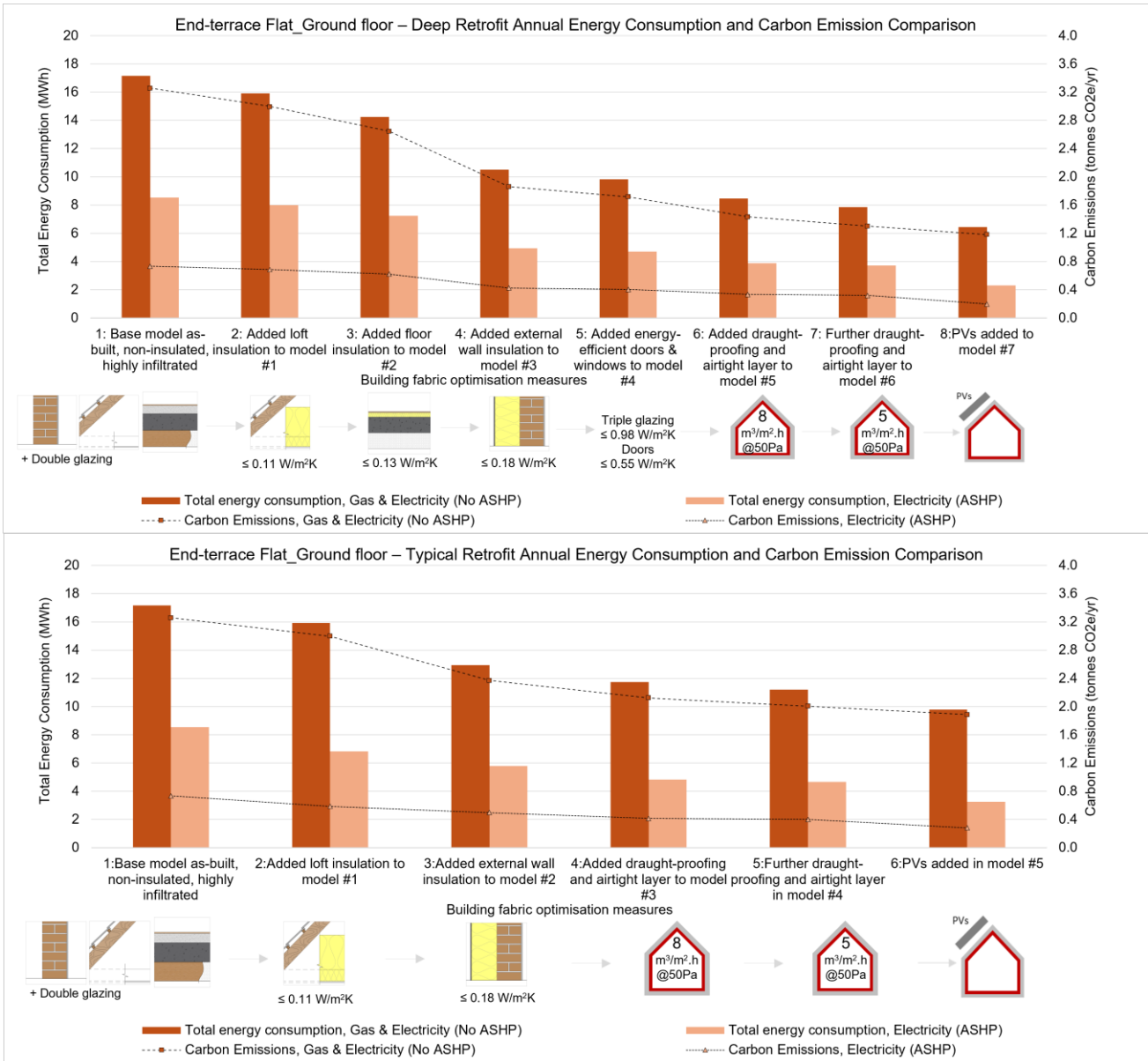


Figure 26: Deep & typical retrofits – heating systems annual energy demand & carbon emission – End-terrace Flat

Annual running energy costs- Cap period October–December 2024

Figure 27 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 30% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 51% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 19% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted , the energy cost was reduced by 41% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes that have lower heat output demands. Additionally, the cost analyses comparing ASHP to gas heating systems for deep and typical retrofit scenarios indicated that the optimal stage to install an ASHP is after the adoption of wall insulation, i.e., Scenario 4 of deep retrofit and Scenario 3 of typical retrofit, thereby ensuring that the ASHP performance is not diminished by low-quality fabric.

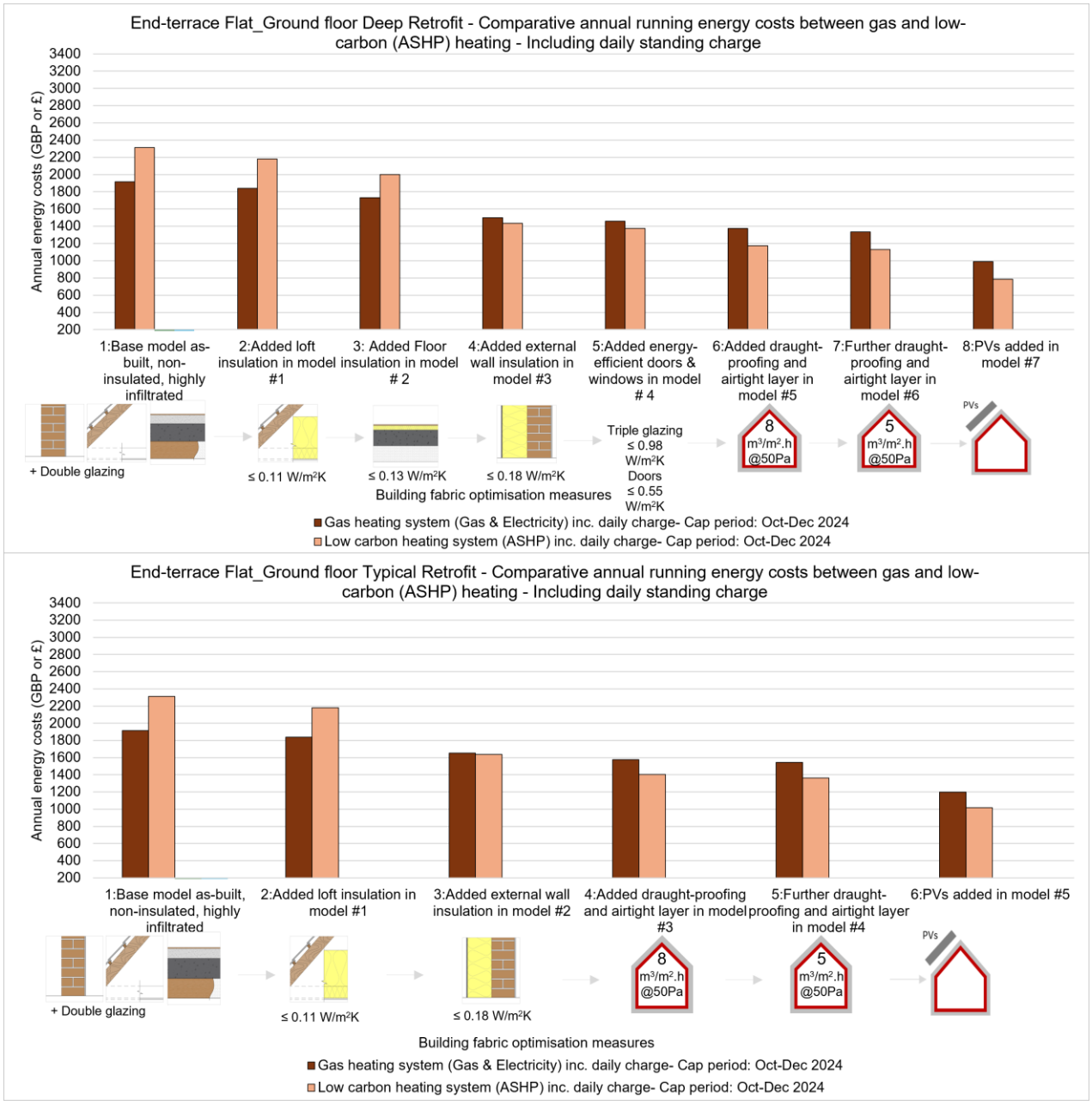


Figure 27: Deep & typical retrofits – heating systems annual costs – End-terrace Flat

2.5 Summary

This section presents a summary of the energy and carbon performance assessment for the generic housing stock, along with a comparative analysis between ‘deep retrofit’ and ’typical retrofit’ scenarios.

The ‘deep retrofit’ scenario consistently resulted in greater reductions in energy consumption and operational carbon emissions. This is primarily due to the implementation of more extensive fabric upgrades. These upgrades, such as the installation of floor insulation and triple-glazed windows were excluded from the ‘typical retrofit’ scenario.

Overall energy consumption across all archetypes showed that the ‘deep retrofit’ scenario achieved a further reduction of approximately 20-34% from the ‘typical retrofit’ measures. Additionally, adopting low-carbon heating systems has demonstrated lower energy consumption across all archetypes than traditional gas heating systems. The cost analyses also suggested that they had marginally lower annual costs when compared to the traditional heating system. Moreover, with the UK transitioning to a decarbonised energy system by around 2050, renewable costs are expected to become cheaper than fossil fuels in the coming years, and so will the energy costs.

The most significant fabric measure identified was the implementation of wall insulation, which proved more effective than other retrofit strategies across all archetypes. This reduction can be attributed to the larger exposed envelope area of the wall insulation compared to other fabric elements.

Table 28-
Table 31 present a summary of the key results related to annual heating demand, total energy consumption, carbon emissions and estimated annual running costs for the generic housing stock in both ‘deep retrofit’ and ’typical retrofit’ scenarios.

Table 28: Summary of the key results related to annual heating demand.

Heating demand (kWh/m²a) Deep retrofit/ Typical retrofit							
	1 Base model as-built, non-insulated, highly infiltrated	2 Added loft insulation to model #1	3 Added floor insulation to model #2	4 Added external wall insulation to model #3	5 Added energy-efficient doors & windows to model #4	6 Added draught-proofing and airtight layer to model #5	7 Further draught-proofing and airtight layer to model #6
Detached house	107	101/ 101	94/ -	43/ 53	36/ -	25/ 45	20/ 42
Semi-detached house	87	80/ 80	70/ -	36/ 47	28/ -	19/ 39	15/ 37
Mid-terrace house	125	115/ 115	97/ -	45/ 52	34/ -	22/ 41	17/ 37
End-terrace house	143	136/ 136	121/ -	47/ 59	37/ -	25/ 48	20/ 44
Mid-terrace flat	148	124/ 124	112/ -	70/ 89	64/ -	40/ 67	29/ 57
End-terrace flat	149	133/ 133	112/ -	63/ 95	55/ -	37/ 79	29/ 72

Table 29: Summary of the key results related to total energy consumption.

Total energy consumption (kWh) Deep retrofit/ Typical retrofit									
		1 Base model as-built, non-insulated, highly infiltrated	2 Added loft insulation to model #1	3 Added floor insulation to model #2	4 Added external wall insulation to model #3	5 Added energy-efficient doors & windows to model #4	6 Added draught-proofing and airtight layer to model #5	7 Further draught-proofing and airtight layer to model #6	8 PVs added to model #7
Detached house	Gas heating	17,617	16,954/ 16,954	16,676/ -	11,028/ 12,153	10,207/ -	9006/ 11,238	8452/ 10,834	7049/ 9431
	ASHP	9276	8991/ 8991	8636/ -	5496/ 6100	5213/ -	4441/ 5253	4283/ 5135	2881/ 3733
Semi-detached house	Gas heating	16,320	15,463/ 15,463	14,970/ -	11,126/ 12,299	10,240/ -	9167/ 11,484	8752/ 11,171	7342/ 9762
	ASHP	8333	7966/ 7966	7500/ -	5221/ 5845	4916/ -	4233/ 5069	4114/ 4978	2705/ 3568
Mid-terrace house	Gas heating	20,831	19,725/ 19,725	17,763/ -	11,839/ 12,617	10,640/ -	9307/ 11,481	8782/ 11,018	7372/ 9608
	ASHP	11,369	10,885/ 10,885	10,027/ -	6712/ 7638	6299/ -	5469/ 6625	5320/ 6490	3910/ 5080
End-terrace house	Gas heating	22,919	22,044/ 22,044	20,361/ -	12,131/ 13,471	11,009/ -	9624/ 12,250	9033/ 11,720	7623/ 10,310
	ASHP	12,282	11,900/ 11,900	11,164/ -	6813/ 7707	6426/ -	5559/ 6660	5391/ 6509	3981/ 5099
Mid-terrace flat	Gas heating	14,913	13,425/ 13,425	12,624/ -	9994/ 11,153	9566/ -	8047/ 9777	7369/ 9149	5961/ 7742
	ASHP	7530	6880/ 6880	6529/ -	4744/ 5144	4597/ -	3734/ 4226	3541/ 4048	2133/ 2640
End-terrace flat	Gas heating	17,158	15,913/ 15,913	14,232/ -	10,502/ 12,923	9814/ -	8465/ 11,743	7841/ 11,189	6434/ 9781
	ASHP	8532	7987/ 7987	7251/ -	4945/ 5780	4707/ -	3883/ 4816	3705/ 4658	2297/ 3250

Table 30: Summary of the key results related to carbon emissions.

Annual carbon emissions ($kgCO_2e/yr$) Deep retrofit/ Typical retrofit									
		1 Base model as-built, non-insulated, highly infiltrated	2 Added loft insulation to model #1	3 Added floor insulation to model #2	4 Added external wall insulation to model #3	5 Added energy-efficient doors & windows to model #4	6 Added draught-proofing and airtight layer to model #5	7 Further draught-proofing and airtight layer to model #6	8 PVs added to model #7
Detached house	Gas heating	3284	3144/ 3144	3086/ -	1900/ 2136	1727/ -	1475/ 1944	1359/ 1859	1239/ 1739
	ASHP	798	773/ 773	743/ -	473/ 525	448/ -	382/ 452	368/ 442	247/ 321
Semi-detached house	Gas heating	2900	2720/ 2720	2617/ -	1810/ 2056	1624/ -	1398/ 1885	1311/ 1819	1190/ 1698
	ASHP	717	685/ 685	645/ -	449/ 503	423/ -	364/ 436	354/ 428	232/ 306
Mid-terrace house	Gas heating	3940	3707/ 3707	3295/ -	2051/ 2215	1800/ -	1520/ 1976	1409/ 1879	1288/ 1758
	ASHP	978	936/ 936	862/ -	577/ 657	542/ -	470/ 570	458/ 558	336/ 437

End-terrace house	Gas heating	4378	4194/ 4194	3841/ -	2113/ 2394	1877/ -	1586/ 2138	1462/ 2026	1341/ 1906
	ASHP	1056	1023/ 1023	960/ -	586/ 663	553/ -	478/ 573	464/ 560	342/ 438
Mid-terrace flat	Gas heating	2796	2483/ 2483	2315/ -	1763/ 2006	1673/ -	1354/ 1717	1211/ 1585	1091/ 1465
	ASHP	648	592/ 592	562/ -	408/ 442	395/ -	321/ 364	305/ 348	183/ 227
End-terrace flat	Gas heating	3259	2997/ 2997	2644/ -	1861/ 2369	1716/ -	1433/ 2121	1302/ 2005	1181/ 1884
	ASHP	734	687/ 687	624/ -	425/ 497	405/ -	334/ 414	319/ 401	197/ 279

Table 31: Summary of the key results related to annual running costs.

Total annual running costs (GBP or £) Deep retrofit/ Typical retrofit									
		1 Base model as-built, non-insulated, highly infiltrated	2 Added loft insulation to model #1	3 Added floor insulation to model #2	4 Added external wall insulation to model #3	5 Added energy-efficient doors & windows to model #4	6 Added draught-proofing and airtight layer to model #5	7 Further draught-proofing and airtight layer to model #6	8 PVs added to model #7
Detached house	Gas heating	2049	2008/ 2008	1991/ -	1638/ 1708	1587/ -	1512/ 1651	1477/ 1626	1134/ 1282
	ASHP	2495	2425/ 2425	2338/ -	1569/ 1717	1499/ -	1310/ 1509	1272/ 1480	928/ 1137
Semi-detached house	Gas heating	2131	2078/ 2078	2047/ -	1807/ 1881	1752/ -	1685/ 1830	1659/ 1810	1314/ 1465
	ASHP	2264	2174/ 2174	2060/ -	1502/ 1654	1427/ -	1259/ 1464	1230/ 1442	885/ 1097
Mid-terrace house	Gas heating	2278	2208/ 2208	2086/ -	1716/ 1765	1642/ -	1558/ 1694	1526/ 1665	1180/ 1320
	ASHP	3008	2889/ 2889	2679/ -	1867/ 2094	1765/ -	1562/ 1845	1526/ 1812	1180/ 1467
End-terrace house	Gas heating	2408	2353/ 2353	2248/ -	1735/ 1818	1665/ -	1578/ 1742	1541/ 1709	1196/ 1364
	ASHP	3231	3138/ 3138	2957/ -	1891/ 2110	1797/ -	1584/ 1854	1543/ 1817	1198/ 1472
Mid-terrace flat	Gas heating	1763	1670/ 1670	1620/ -	1456/ 1528	1429/ -	1334/ 1442	1292/ 1403	947/ 1058
	ASHP	2067	1908/ 1908	1822/ -	1385/ 1482	1348/ -	1137/ 1258	1090/ 1214	745/ 869
End-terrace flat	Gas heating	1915	1838/ 1838	1733/ -	1500/ 1651	1457/ -	1373/ 1578	1334/ 1543	989/ 1198
	ASHP	2313	2179/ 2179	1999/ -	1434/ 1638	1376/ -	1174/ 1402	1130/ 1363	785/ 1019

3 Retrofit Generic Housing Embodied Carbon Calculations

The built environment accounts for roughly 40% of total UK carbon emissions (UKGBC, 2023) Carbon emissions associated with the built environment are attributable not only to the use of built assets (operational carbon emissions) but also to their construction (embodied carbon emissions). Operational emissions are attributable to the everyday running of a building whereas embodied emissions result from the production, procurement and installation of the building's materials and components (construction). Embodied emissions also include the lifetime emissions from maintenance repair, replacement, demolition, and disposal. Both operational and embodied emissions are assessed according to their Global Warming Potential (GWP), measured in kilograms or tons of carbon dioxide equivalent per square metre floor area ($kgCO_2e/m2$ or $TCO_2e/m2$).

Operational emissions relate to Life Cycle stages B6 and B7 (see Figure 28). Embodied emissions are calculated at Life Cycle Stages A1-A5, B1-B5, and C1-C4. This section focuses on the embodied emissions associated with both the deep and typical retrofit scenarios for the 'generic' house-types, as defined within Section 0.

Figure 28: Whole Life Carbon Stages

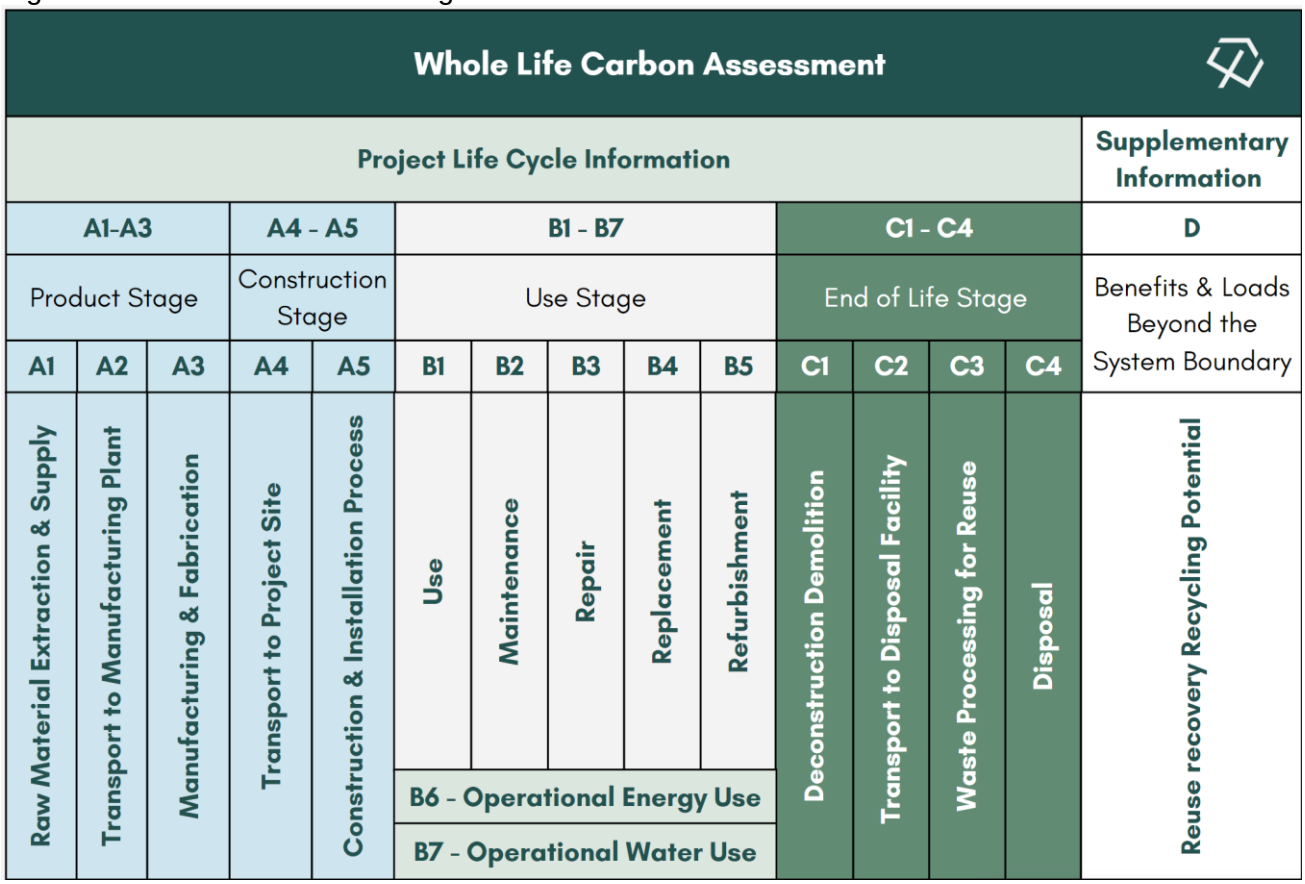


Figure 28: Whole Life Carbon Stages (Develeco, 2025)

3.1 Methodology and Assumptions

The embodied carbon calculations were undertaken Using OneClick LCA in accordance with RICS guidance 2024 (2nd Edition) (RICS, 2024).

Reference Study Period (RSP)

The Reference Study Period (RSP) is the period of analysis for the embodied carbon assessment. Non-domestic projects must be analysed over a 60-year RSP, in order to be considered compliant with the RICS Professional Standard. For domestic projects, the requirements are less strict, and there are no industry-specific standards for retrofit.

For this analysis, we have assumed a 20-year RSP for all data analysis and associated outputs. According to a study conducted by the Ministry of Housing, Communities and Local Government, UK owner-occupiers live in the same home for an average of 17.2 years (Ministry of Housing, 2024) . Life expectancy has therefore been set at 20 years in order to simplify calculations. We determined that a 60-year period was an excessively long timeframe for evaluating total payback, as it is unlikely to align with typical stakeholder concerns. Furthermore, this duration would necessitate the replacement of systems such as ASHPs and solar panels at least twice within the assessment period. Such replacements would have introduced significant variability in the results, potentially skewing the overall payback analysis.

Product Stage (A1-A3)

Product Stage modules include the $kgCO_2e$ released during extraction, processing, manufacture (including prefabrication of components or elements) and transportation of materials between these processes, until the product leaves the factory gates to be taken to site. Note that recycled content of a product affects the $kgCO_2e$ released in modules A1-A3.

Construction Process Stage (A4-A5)

Construction Process modules include the $kgCO_2e$ released during transportation of materials and products to site, energy usage due to activities on site (site huts, machinery use etc.) and the $kgCO_2e$ associated with the production, transportation, and end-of-life processing of materials used on site.

Use Stage (B1-B5)

Use Stage modules (excluding B6-B7) include the $kgCO_2e$ released due to use, maintenance, repair, replacement, and refurbishment while the building is in use. Module B4 (replacement) is often a key focus of the use stage when embodied carbon is being considered.

End of Life Stage (C1-C4)

End of Life modules include the $kgCO_2e$ released during decommissioning, stripping out, demolition, deconstruction, transportation of materials away from the site, waste processing and the disposal of materials.

Benefits and Loads Beyond the System Boundary (D)

Module D is an additional stage beyond the life cycle of the asset that is intended to provide a broader view of its environmental impacts. Module D emissions have been excluded from this assessment, subject to further information being provided.

Assumptions

Table 32: Breakdown of assumptions (RICS, 2024)

Lifecycle Stage	Assumptions
Product Stage (A1 – A3)	Calculated using EPDs which align with the exact product and/or material specification or the most applicable similar product.
Construction Stage (A4 – A5)	Transportation to site (A4) – calculated using RICS assumptions: 50 km (locally sourced materials such as concrete-mix), 300 km (national sourced materials such as steel), 1,500 km (internationally sourced within the EU). Site operations including construction waste (A5) – based on 40 $kgCO_2e/m2$ (as per RICS 2024 guidance).
Use Stage (B1 – B5)	Refrigerant leakage is accounted for. Maintenance (B2) and Repair (B3) have been accounted for in the results, expressed as a % of material repaired per year based on RICS guidance estimates for these modules (i.e., 1% of A1-A5) For B2 and 25% of B2 for B3. Replacement (B4) and Refurbishment (B5) is based on the product specific service life and where applicable, RICS defaults.
Operational Energy Use (B6)	Excluded.
Operational Water Use (B7)	Excluded.
End of Life Stage (C1-C4)	Based on End of Life (EoL) Market Scenarios as noted in RICS 2017. C1 has been accounted for each building element based on a % contribution of each element to the embodied carbon figure, this percentage has then been applied to the GIA and distributed accordingly.
Module D	Excluded.
Pre-Demolition Assumptions	The emissions associated with preconstruction demolition are reported using the GLA and RICS standard assumptions in addition to the Pre-demolition Audit quantities.

3.2 Results

Using the base building assumptions as defined within Section 2, embodied carbon models have been created for each property-build type. In Table 33, a summary results table is provided for each property build-type, comparing the deep and typical retrofit scenarios.

Table 33: Embodied Carbon Results Summary - All House Types (Deep and Typical)

Property-build type	Type of Retrofit	A1-A5, B1-B5,C1-C4 ($kgCO_2e/m2$)	GIA (m2)	A1-A5, B1-B5,C1-C4 (TCO_2e)
Detached	Deep	138.42	89.90	12.44
	Typical	97.05	89.90	8.73
Semi-detached	Deep	136.45	89.90	12.27
	Typical	86.99	89.90	7.82
Mid-terrace	Deep	118.99	89.70	10.67
	Typical	72.57	89.70	6.51
End-terrace	Deep	128.07	89.70	11.49
	Typical	85.00	89.70	7.62
Mid-terrace Flat (Whole)	Deep	108.95	112.90	6.26
	Typical	108.95	112.90	7.60
	Deep	108.95	112.90	12.30

End-terrace Flat (Whole)	Typical	108.95	112.90	7.60
Mid-terrace Flat	Deep	123.04	50.90	6.26
	Typical	81.53	50.90	4.15
End-terrace Flat	Deep	118.34	62.00	7.34
	Typical	76.82	62.00	4.76

Full data exports are provided in Appendix B: Embodied Carbon Data Exports. Table 33 provides a summary of total embodied carbon emissions only. Table 34 and 35 provide a detailed breakdown of GWP according to resource type, across the varied house types.

Table 34: Combined Global Warming Potential across all house types (kgCO_2e/m2) (Typical Retrofit Scenario)

House Type	**Detached**	**Semi Detached**	**Mid Terrace**	**End Terrace**	**Mid Terrace Flat**	**End Terrace Flat**
Stone wool insulation	39.52	35.09	25.19	32.20	24.37	24.37
Energy production systems from renewable energy	14.89	14.89	14.93	14.93	26.30	21.59
HVAC equipment with refrigerant	13.21	13.21	13.24	13.24	10.52	10.52
Mortar (masonry/bricklaying)	16.14	11.32	7.40	12.01	9.25	9.24
Other site operation	5.50	5.50	5.51	5.51	5.50	5.50
Refrigerant fluids	4.51	4.51	4.52	4.52	3.59	3.59
Textiles and wallpapers	2.76	1.95	1.27	2.06	1.59	1.59
Plastic profiles and products	0.32	0.32	0.32	0.32	0.25	0.25
HVAC components and equipment	0.21	0.21	0.21	0.21	0.16	0.16
Total	97.05	86.99	72.57	85.00	81.53	76.82

Table 35: Combined Global Warming Potential across all house types (kgCO_2e/m2) (Deep Retrofit Scenario)

House Type	**Detached**	**Semi Detached**	**Mid Terrace**	**End Terrace**	**Mid Terrace Flat**	**End Terrace Flat**
Stone wool insulation	39.52	35.16	28.53	32.20	26.67	27.56
Other insulation	26.45	26.46	27.56	27.56	24.37	25.19
Energy production systems from renewable energy	16.14	14.94	14.93	14.93	26.30	22.31
HVAC equipment with refrigerant	14.89	13.28	13.24	13.24	11.15	11.52
Mortar (masonry/bricklaying)	13.21	11.40	9.92	12.01	10.07	9.55
Other site operation	8.95	10.47	8.25	9.92	9.24	8.52
PVC frame windows	8.25	9.10	7.40	8.25	8.25	10.41
Refrigerant fluids	4.51	9.01	4.52	4.52	3.59	3.71
Textiles and wallpapers	2.76	2.48	1.47	2.06	1.59	1.64
Other resource types	3.74	4.14	3.19	3.39	1.80	1.86
Total	138.42	136.45	118.99	128.07	123.04	122.28

Note: This CGWP is calculated on a per square meter basis, therefore resulting in a higher rate for the smaller mid-terrace flat compared to the end terrace flat.

To understand the specific embodied carbon impact at Retrofit Stages 1, 2 and 3 (as defined within Section 0), a more detailed breakdown is required, as provided within Table 36 and Table 37.

Table 36: Breakdown by Retrofit Stage across all house types (Typical Retrofit Scenario)

House Type	Detached		Semi		Mid Terrace		End Terrace		Mid Terrace Flat		End Terrace Flat	
	GWP	%	GWP	%	GWP	%	GWP	%	GWP	%	GWP	%
Retrofit Stage 1 - Fabric	64.24	66%	54.17	62%	39.69	55%	52.11	61%	40.96	50%	40.96	53%
Retrofit Stage 2 - Low Carbon Heating	17.92	18%	17.92	21%	17.96	25%	17.96	21%	14.27	18%	14.27	19%
Retrofit Stage 3 - Renewable Technology	14.89	15%	14.89	17%	14.93	21%	14.93	18%	26.30	32%	21.59	28%
Total	97.05	100%	86.99	100%	72.57	100%	85.00	100%	81.53	100%	76.82	100%

Table 37: Breakdown by Retrofit Stage across all house types (Deep Retrofit Scenario)

House Type	Detached		Semi		Mid Terrace		End Terrace		Mid Terrace Flat		End Terrace Flat	
	GWP	%	GWP	%	GWP	%	GWP	%	GWP	%	GWP	%
Retrofit Stage 1 - Fabric	105.82	76%	99.22	73%	86.32	73%	95.39	74%	82.00	67%	82.00	69%
Retrofit Stage 2 - Low Carbon Heating	17.71	13%	22.29	16%	17.75	15%	17.75	21%	14.74	12%	14.74	12%
Retrofit Stage 3 - Renewable Technology	14.89	11%	14.94	11%	14.93	13%	14.93	18%	26.30	21%	21.59	18%
Total	138.42	100%	136.45	100%	118.99	100%	128.07	113%	123.04	100%	118.34	100%

Using the output data, a series of graphical representations of the results are provided at Figure 29, Figure 30, Figure 31 and Figure 32

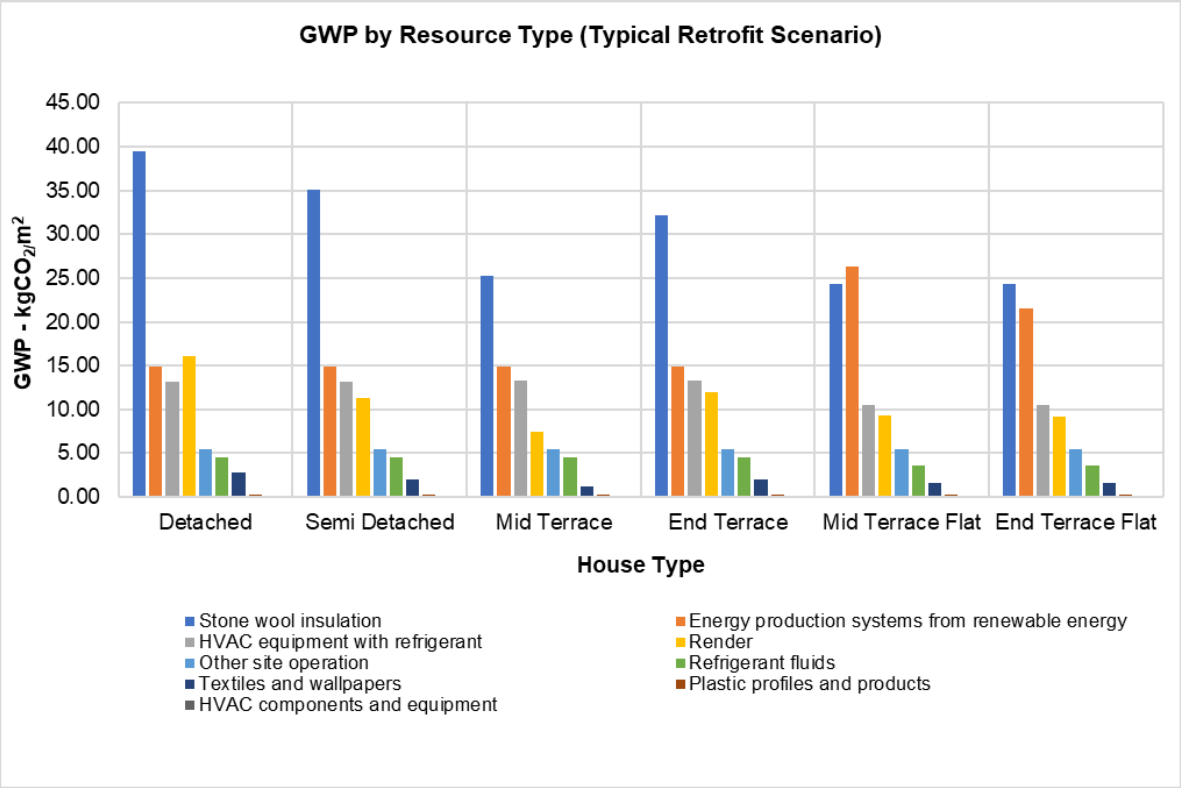


Figure 29: Global Warming Potential by Resource Type (Typical Retrofit Scenario)

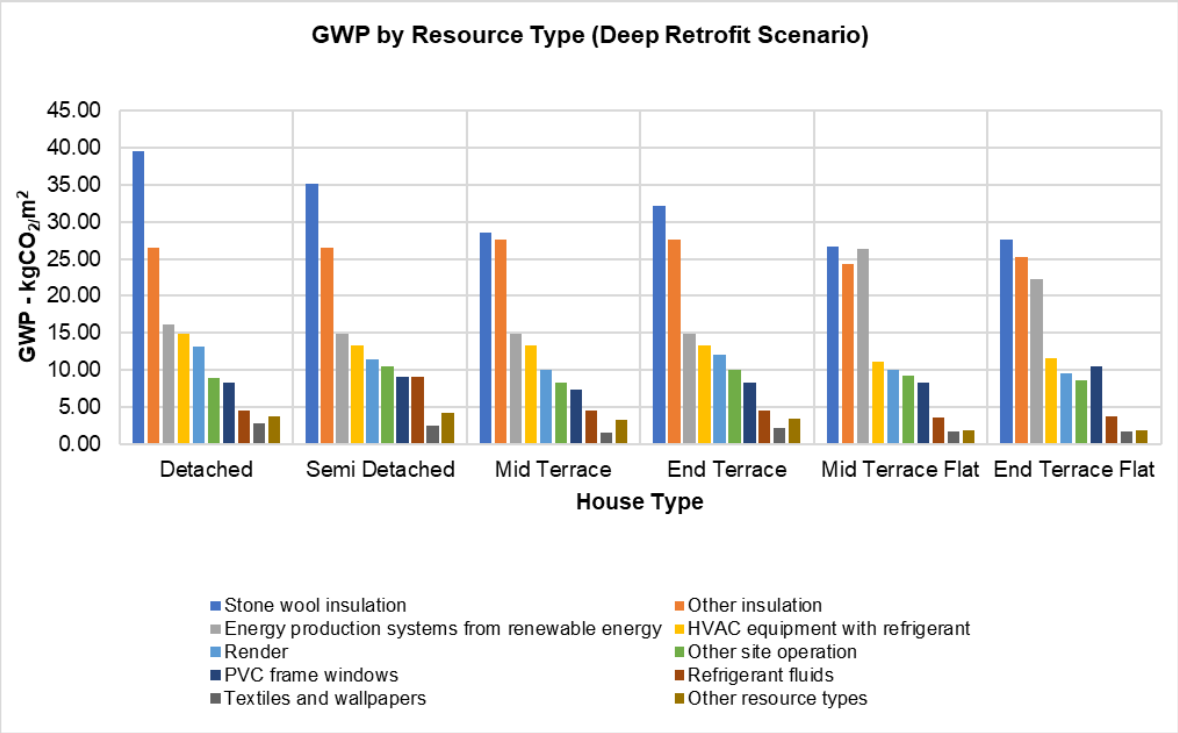


Figure 30: Global Warming Potential by Resource Type (Deep Retrofit Scenario)

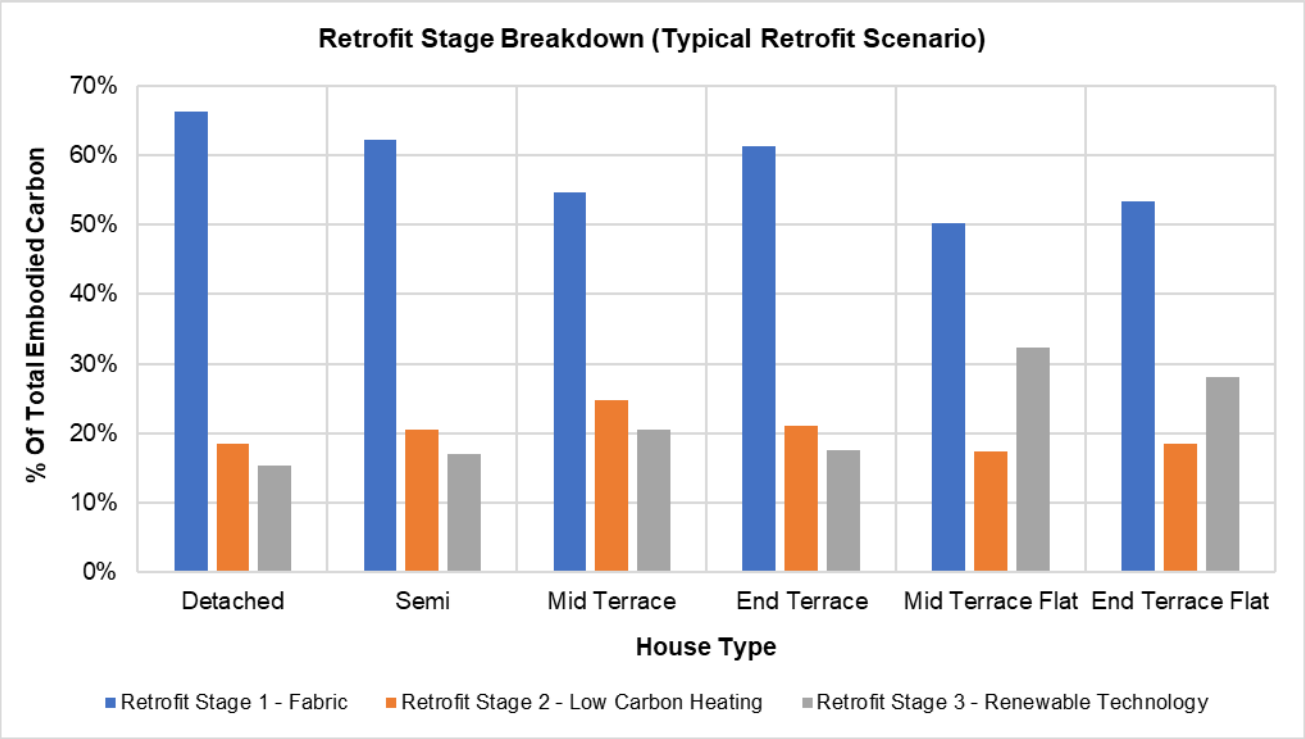


Figure 31: Retrofit Stage Breakdown across all house types (Typical Retrofit Scenario)

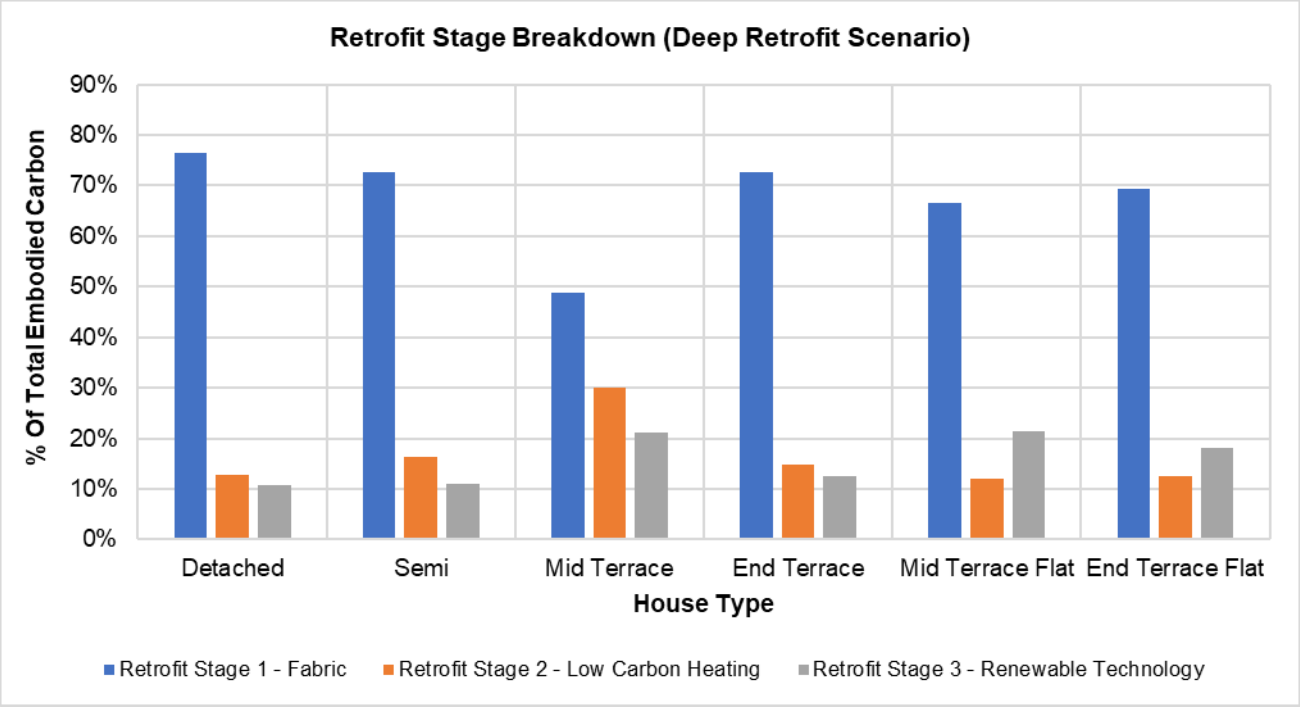


Figure 32: Retrofit Stage Breakdown across all house types (Deep Retrofit Scenario)

3.3 Summary

A comparative analysis has been undertaken between ‘Deep retrofit’ and ’Typical retrofit’ scenarios. The ‘Deep retrofit’ scenario consistently results in higher total embodied carbon emissions, primarily due to the inclusion of more extensive fabric upgrades. These upgrades, such as the installation of floor insulation and new triple-glazed windows, are omitted from the ‘Typical retrofit’ scenario, leading to the observed differences in carbon footprint.

In terms of overall emissions, the ’typical retrofit’ measures account for approximately 60-70% of the total emissions generated from a ‘deep retrofit’ approach. The analysis further reveals that detached houses exhibit the highest embodied carbon emissions per square meter, at 138.4kgCO_2e/m² and 97.1kgCO_2e/m² for the deep and typical scenarios, respectively. Despite the Gross Internal Area (GIA) remaining consistent with other house types, the Detached House is comprised of an increased number of heat loss perimeter walls, necessitating a larger surface area of external wall insulation. Conversely, the lowest emissions per square meter were observed in end-terrace flats, where only two of the four external walls are insulated, contributing to a lower figure of 118.3kgCO_2e/m² for the ‘deep retrofit’ scenario.

Across all property types, fabric improvements are the most significant contributor to embodied carbon emissions, accounting for between 39.7 and 64.2kgCO_2e/m² across the property types. The next largest contributor is the HVAC equipment, which includes heat pumps and cylinders, which contribute 18.0kgCO_2e/m² to the total. With the exception of the flats, these figures remain constant across the property types, reflecting uniformity in the type and size of the HVAC equipment installed. The GWP for each flat has been calculated on a pro-rata basis, based on GIA as a percentage of the whole property. This follows the principle that flats would not be retrofitted individually or in isolation, but as part of a ‘whole building’ approach.

Among the additional measures introduced exclusively in the ‘Deep retrofit’ scenario, new floor insulation emerged as the most carbon intensive. For detached house type, floor insulation contributes 26.5kgCO_2e/m² to the overall emissions. This is followed by the installation of triple-glazed PVC windows, which contributes a further 8.3kgCO_2e/m².

In conclusion, across all property types, implementing a typical retrofit, as opposed to a deep retrofit, results in a saving of roughly 30-40% in embodied carbon. In the case of a detached house, a deep retrofit results in 12.4tonnes of CO_2e whereas a typical retrofit generates 8.7tonnes of CO_2e. This additional 3.7tonnes of CO_2e is what must be saved in operational carbon emissions over the lifetime of the property to make the deep retrofit scenario worth pursuing. This will be evaluated in detail as part of subsequent analysis.

4 Retrofit Specific Housing Performance Assessment

This section presents the results of the energy performance assessment of specific housing stock. It examines real case studies from Broxtowe housing stock to determine whether the projects and their specifications achieve the predicted performance outcomes. Both typical and deep retrofitting approaches are considered for the performance assessment. The performance of retrofitted homes is calculated using thermal dynamic building simulation, based on typical inputs and housing characteristics.

4.1 Simulation Models, Stages and Assumptions

This section presents the building model (or archetype), retrofit stages and assumptions used in the simulations.

Model

Building on our previous exploration of various property types (archetypes) under the general housing performance assessment, the bungalow housing type was selected for a detailed evaluation in the specific housing assessment. For this case study, a detached bungalow was chosen from the Broxtowe housing stock, constructed in the early 1980s. This housing typology represents 11.2% of the Broxtowe's housing stock. Table 38 illustrates the property type, alongside the corresponding geometric data, shown in Table 39. The retrofit stages (Stages 1, 2 & 3) and the assumptions used in the simulation were the same as outlined in Section 2.1.

Table 38: Housing archetype – Floor plan and perspective

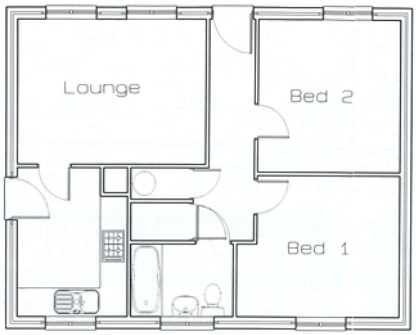
Bungalow		

Table 39: Housing archetype – Building geometry data and air permeability assumptions

Detached Bungalow - Building Components	Area (m^2)
Ground Floor Area	53.5
Total Floor Area	53.5
Roof (ceiling level)	57.8
Roof (if sloped)	69
Wall (External walls)	86.7
Window	8.1
External Door	3.8
Roof Volume (m^3)	63.5
All internal air volume (m^3) (for infiltration calculation)	130
Wall + Roof + Ground Floor Area (Building Fabric area used for infiltration calculation)	198
ACH if airtight test (very leaky type) is 15 m^3/hm^2 @ 50Pa (and 1/20 rule) -Test / Base	1.14

ACH if airtight test is 8 m^3/hm^2 @ 50Pa (and 1/20 rule) - Optimised to Part L 2021 max. permitted	0.61
ACH if airtight test is 5 m^3/hm^2 @ 50Pa (and 1/20 rule) - Optimised to Part L 2021 notional	0.38

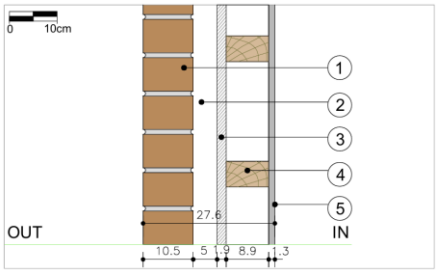
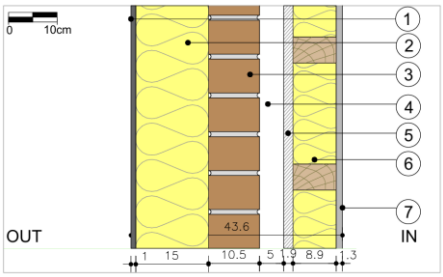
4.2 Building Fabric

In this section, each construction component (walls, roof, floor, glazing and doors) is explored in terms of its material composition and typical U-value. An optimised component is then proposed, based on national standards, and best retrofit practices (as shown in Section 1.2). Notional Part L2021 U-value limits were adopted.

Walls

Wall construction type (as built and optimised) is illustrated in Table 40.

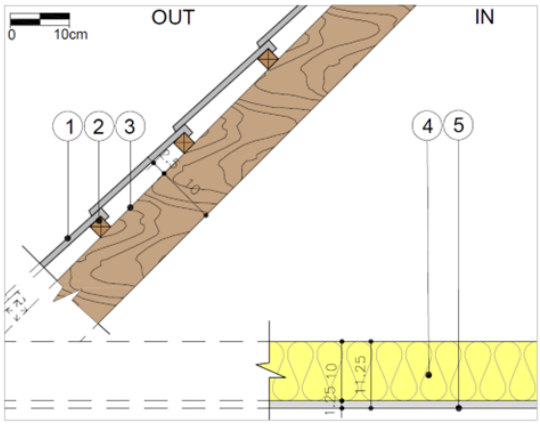
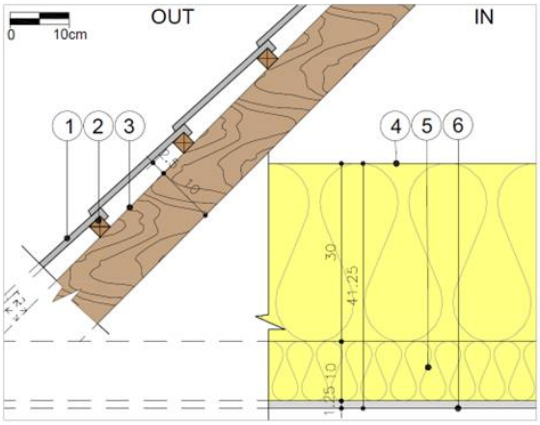
Table 40: Wall construction type – As-built and optimised, based on CIBSE (2019a, p. 3-52, 3-12)

External Wall	Construction specification	U-value (W/m^2K)	Section
As-built based on CIBSE (2019a, p. 3-52, 3-12) Complies with 1976 build. reg ≤ 1.00 W/m^2K	Non-insulated timber frame wall, 50mm cavity Total thickness: 276mm Layers from outside to inside: 1. 105mm solid brick 2. 50mm airspace 3. 19mm plywood sheathing 4. 89mm timber framework/ studding 5. 13mm plasterboard	1.10	
Optimised Target: Part L 2021 notional U-value (W/m^2K) ≤ 0.18	Externally insulated timber frame wall, cavity between timber framework filled with insulation Total thickness: 436mm Layers from outside to inside: 1. 10mm basecoat/mesh/render 2. 150mm EWI Mineral wool 3. 105mm solid brick 4. 50mm airspace 5. 19mm plywood sheathing 6. 89mm mineral wool insulation between timber frameworks 7. 13mm plasterboard	0.16	

Roof

Roof construction type (as built and optimised) is illustrated in Table 41

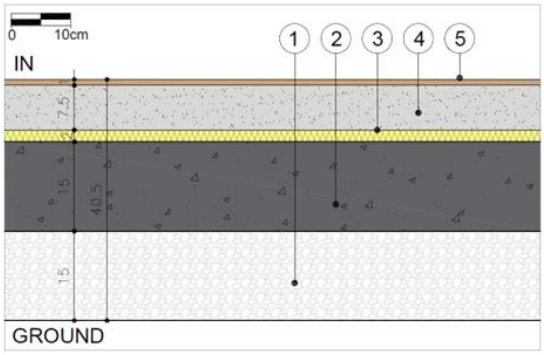
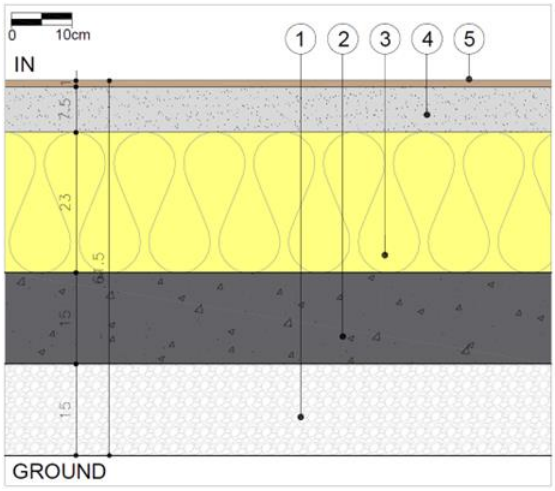
Table 41: Roof construction type – As-built and optimised, based on CIBSE (2019a, p. 3-54)

Roof	Construction specification	U-value (W/m²K)	Section
As-built Based on CIBSE (2019a, p. 3-54) Complies with 1976 build. reg ≤ 0.60 W/m²K	Low insulated pitched roof (cold roof) Total thickness: 112.5mm Layers from outside to inside: 1. 20mm tiles (ventilated) 2. 25mm roof space – battens (ventilated) 3. mm windtight barrier above the rafters 4. 100mm mineral wool between 100mm ceiling joists 5. 12.5mm plasterboard	0.35	
Optimised Target: Part L 2021 notional U-value (W/m²K) ≤ 0.11	Highly insulated pitched roof (insulated at ceiling level) Total thickness: 412.5mm Layers from outside to inside: 1. 20mm tiles (ventilated) 2. 25mm roof space – battens (ventilated) 3. windtight barrier above the rafters 4. 300mm mineral wool over ceiling joists 5. 100mm mineral wool between 100mm ceiling joists 6. 12.5mm plasterboard	0.10	

Floor

Floor construction type (as built and optimised) is illustrated in Table 42.

Table 42: Floor construction type – As-built and optimised, based on CIBSE (2019a, p. 3-55 - 3-56)

Floor	Construction specification	U-value (W/m²K)	Section
As-built Based on CIBSE (2019a, p. 3-55 - 3-56) Complies with 1976 build. reg ≤ 1.00 W/m²K	Low Insulated solid floor Total thickness: 405mm Layers from outside to inside: Ground 1. 150mm hardcore 2. 150mm cast concrete 3. 20mm EPS 4. 75mm screed 5. 10mm carpet	0.77	
Optimised Target: Part L 2021 notional U-value ≤ 0.13 W/m²K if fully re-built	Highly insulated solid floor (it presupposes that the floor was fully rebuilt) Total thickness: 615mm Layers from outside to inside: 1. 150mm hardcore 2. 150mm cast concrete 3. 230mm EPS 4. 75mm screed 5. 10mm carpet	0.13	

Glazing and doors

Proposed improvements to glazing and doors aimed to comply with Part L2021 notional building (Ministry of Housing; Communities and Local Government, 2021) and should be smaller than or equal to 1.20 (6+12+6+12+6mm, 0.98 W/m^{2}K) and 1.00W/m^{2}K, respectively.

4.3 Retrofit Stage 1: Building Fabric Optimisation

The as-built building fabric was first examined to explore the heating demands achieved across the investigated archetype. Following this, a series of simulations were conducted to measure the energy efficiency resulting from cumulative changes in the fabric. These changes aimed to reach the notional levels of Part L 2021, considering a deep retrofit approach. Additionally, a typical retrofit approach was adopted that excluded the more costly and disruptive strategies (as explained in Table 20). The purpose of this investigation was to determine the extent to which energy demand can be reduced by

optimising the building fabric. This stage of assessment only involved improved fabric energy efficiency and airtightness levels. There were no active system improvements such as the use of ASHP.

The results analysed are shown in Figure 33.

Detached Bungalow

Deep Retrofit

- In the initial as-built scenario, the estimated heating demand was 89 kWh/m². Following the implementation of a series of retrofit measures based on Part L notional levels, the heating demand was reduced to 14 kWh/m², marking an overall reduction of 84% when all the deep retrofit measures were in place. It is noteworthy that loft insulation only resulted in a 2% decrease in heating demand compared to the base case, while solid floor insulation reduced the demand by 11% in scenario 3 compared to scenario 2.
- The addition of external wall insulation in scenario 4 had the most significant impact, reducing heating demand by 33% compared to the previous scenario. This is due to its larger exposed envelope area compared to the other fabric elements.
- Opting for energy-efficient glazing and doors also proved beneficial, leading to an additional 11% improvement in comparison to the previous scenario, due to a significant improvement in the U-values. However, it is important to note that implementing this measure is both costly and disruptive.
- The addition of airtightness and draught-proofing in scenario 6 reduced the heating demand by 19%. Further improvement in airtightness (scenario 7) from 8 to 5 m³/m²h @50 Pa resulted in an additional 8% reduction.

Typical retrofit

- The initial heating demand was estimated to be 89 kWh/m². After implementing a series of retrofit measures, the heating demand was reduced to 41 kWh/m², representing a significant reduction of 54%.
- According to the results presented in Figure 33, loft insulation only reduced the heating demand by 2% in scenario 2 compared to the base case (scenario 1). While this had a relatively small impact on reducing heating demand, it is also one of the easiest strategies to implement.
- Furthermore, external wall insulation was found to be the most impactful measure, reducing the heating demand by 29% in scenario 3 compared to scenario 2. This is due to its larger exposed envelope area compared to the other fabric elements.
- The addition of airtightness and draught-proofing in scenario 4 decreased the heating demand by 16%. Further improvement in airtightness (scenario 5) from 8 to 5 m³/m²h @50 Pa resulted in an overall 54% reduction in heating demand.

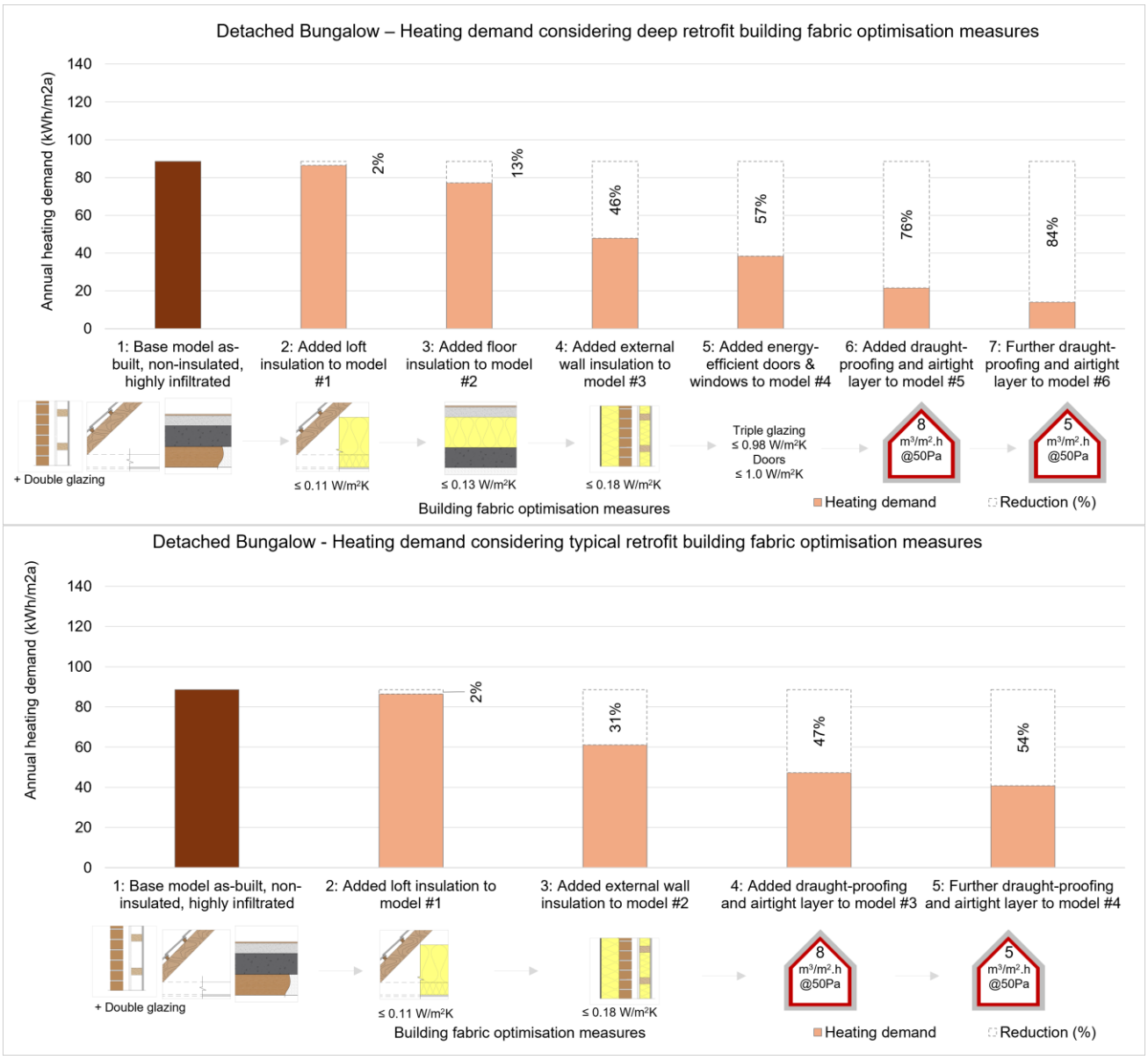


Figure 33: Deep & typical retrofit fabric measures – Detached Bungalow

4.4 Retrofit Stage 2 & Stage 3: Low-Carbon Heating & Renewable Energy Generation

The following section looks at the simulations carried out to measure the energy, carbon and cost impact achieved by the adoption of low-carbon heating system in comparison to typical gas heating system. One of the main aims is to gain an insight into which stage of building fabric optimisation measures, ASHP can be installed without negatively impacting on household energy bills.

For space heating and domestic hot water (DHW), typical gas boiler and ASHP heating systems were adopted for comparative purposes. Heating inputs were considered, as mentioned in Table 23, and DHW mean consumption was assumed as 112.2 litres/day for a two-person occupancy (Hot water assumptions in the Home Energy Model: FHS assessment wrapper, 2023).

The seasonal efficiencies and SCOP for the gas boiler and ASHP were assumed the same as mentioned in Section 2.4

A solar PV system was adopted for renewable energy generation. For simulation purposes, 14 solar panels were considered based on the usable roof size. The panel type was monocrystalline silicon, and the other specifications include a panel size of 2m², module nominal efficiency of 0.20, nominal cell temperature (NOCT) of 42°C, and temperature coefficient for module efficiency Pmax as -0.36%/°C (Jinko Solar, 2020). All the panels were inclined at 33° and oriented southeast.

The total energy demand was calculated by considering the energy needed to run the house over a year, based on space heating, electricity (lighting and appliances), and hot water inputs.

The natural gas and electricity have carbon emission factors equivalent to 0.21 kgCO_2e/kWh and 0.086 kgCO_2e/kWh respectively (Fuel factors within the Home Energy Model: FHS assessment, 2023).

The comparative annual running costs of gas and low-carbon heating systems were calculated, considering the cumulative building fabric optimised changes targeting the Part L 2021 notional levels. For the cost analyses, the daily standing charge was considered for both gas and electricity. The assumptions concerning the energy tariffs and carbon emissions factors are mentioned in Table 27. The energy tariffs are average and use direct debit payment as a reference (Ofgem, 2024).

Detached Bungalow

Figure 34 illustrates a comparison of simulation results for energy consumption and carbon emissions between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. A consistent trend is evident across both retrofit scenarios, prompting a detailed explanation of the simulation results for deep retrofit scenarios for better comprehension.

The energy consumption with gas boiler heating systems was much higher in leaky, non-insulated scenario. However, when fabric optimisation measures were considered, energy consumption was significantly reduced. In the initial, as-built scenario, the annual energy consumption (including gas and electricity) was 11.7 MWh. After implementing fabric optimisation measures, the overall energy consumption dropped by 43% to 6.7MWh. When renewable energy sources were added, the energy demand decreased further to 3 MWh. When using an ASHP, the total energy consumption was significantly lower than a gas boiler heating system. This was due to the efficiency of the system and inputs adopted. The building fabric's sequential improvement could further reduce energy consumption. The total annual energy consumption for the uninsulated envelope using an ASHP corresponded to 6.7MWh. Once the fabric optimisation measures were considered, the energy demand was reduced by 43%, reaching nearly 3.8MWh. Renewable energy further reduced the total annual energy consumption to 0.1MWh.

In terms of carbon emissions, a considerable difference in the results was observed when considering a traditional gas boiler as a heating system compared to an ASHP. As expected, the carbon emissions attributable to the gas boiler system were significantly higher than the low-carbon heating system. The carbon emission values when considering a traditional gas boiler heating system corresponded to 2 tonnes CO_2e/yr, reducing to 1.0 tonne CO_2e/yr once the fabric optimisation measures were considered. Comparatively, when adopting ASHP, the carbon emissions corresponded to 0.5 tonnes CO_2e/yr and were reduced to half when the fabric optimisation measures were considered, respectively. Renewable energy further reduced the total carbon emissions to 0 tonnes CO_2e/yr. It is

noteworthy that the external wall insulation of the fabric optimisation measures contributed significantly to reducing energy consumption and carbon emissions.

The overall energy and carbon simulation results indicated that implementing fabric optimisation measures led to more than a 50% reduction in both energy consumption and carbon emissions. Furthermore, it was also observed that simply switching to a low-carbon heating system without adopting any fabric measures led to a 72% decrease in carbon emissions, when compared to the emissions produced by gas heating systems. This shows that replacing fossil fuels-based systems with low-carbon heating, most likely ASHPs, in combination with the decarbonisation of the electricity grid, can achieve significant carbon emission reductions. However, it is crucial that fabric retrofit measures precede the installation of low-carbon alternatives to ensure consumer energy bills remain affordable and demand can be met. ASHPs are most suited to installation in better-insulated, quality-built homes that demand lower heat output due to their operation at lower temperatures. Its adoption in leaky homes means that ASHP runs continuously and is likely to negatively impact the thermal comfort of the occupants, assuming radiators are kept at the typical sizes.

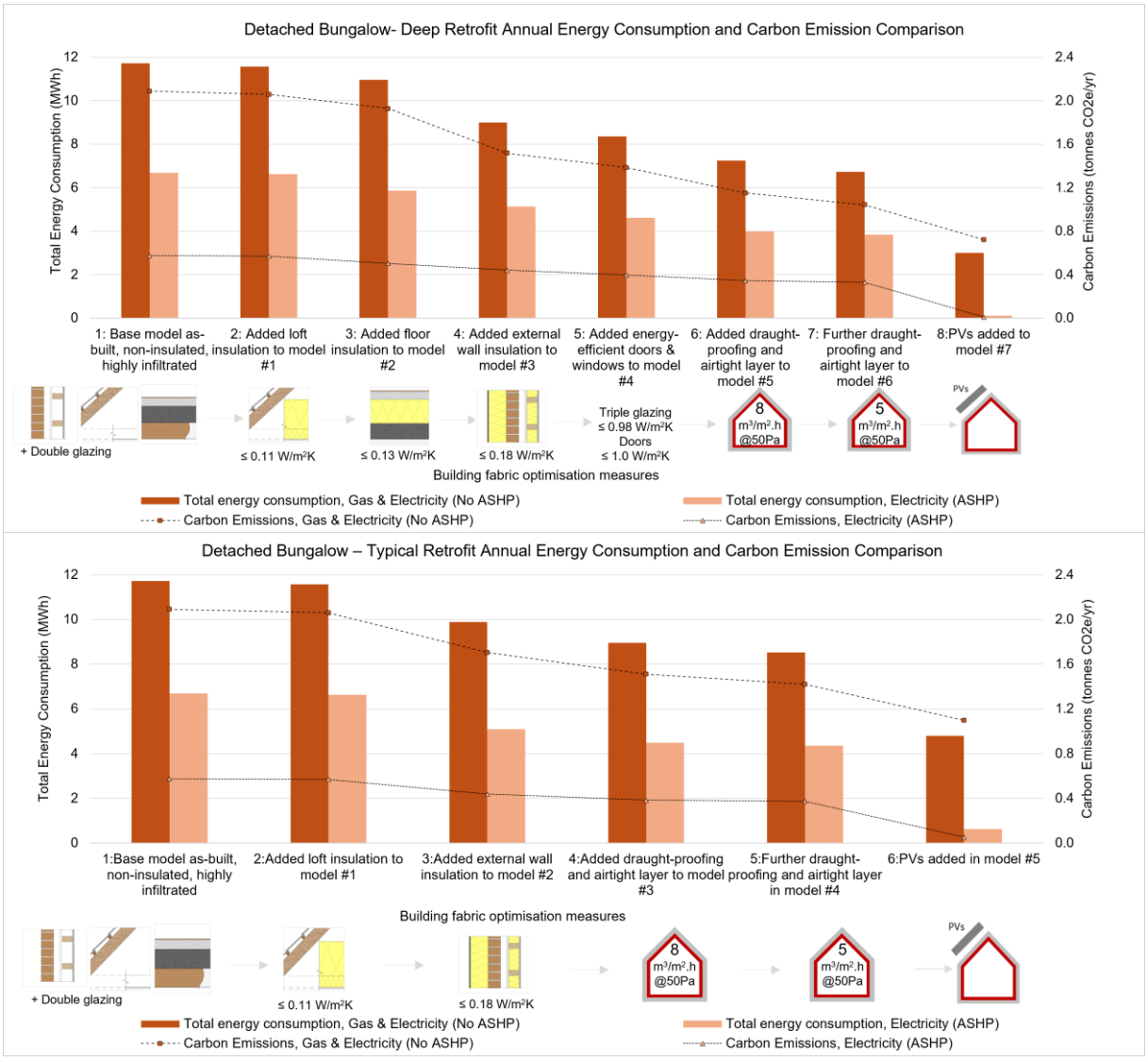


Figure 34: Deep & typical retrofits – heating systems annual energy demand & carbon emission – Bungalow

Annual running energy costs- Cap period October–December 2024

Figure 35 illustrates the comparative annual energy costs between ASHP and a conventional gas heating system for deep retrofit and typical retrofit scenarios. The annual running costs calculated for winter 2024 (October–December 2024 cap period) showed a gradual reduction across the sequential fabric optimisation scenarios, independent of the heating system adopted.

With all the deep retrofit measures adopted (up to Scenario 7), the annual energy cost while considering the gas heating system was reduced by 19% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted, the energy cost was reduced by 37% compared to the base case, non-retrofit scenario.

Similarly, after implementing all typical retrofit measures up to Scenario 5, the annual energy cost using a gas heating system was reduced by 12% compared to the base case scenario. Comparatively, with a low-carbon heating system adopted, the energy cost was reduced by 31% compared to the base case, non-retrofit scenario.

This highlights the suitability of heat pumps for installation in well-insulated, high-quality homes with lower heat output demands. Additionally, the cost analyses comparing ASHP to gas heating systems for deep and typical retrofit scenarios indicated that the optimal stage to install an ASHP is after the adoption of wall insulation, i.e., Scenario 4 of deep retrofit and Scenario 3 of typical retrofit, thereby ensuring that the ASHP performance is not diminished by low-quality fabric.

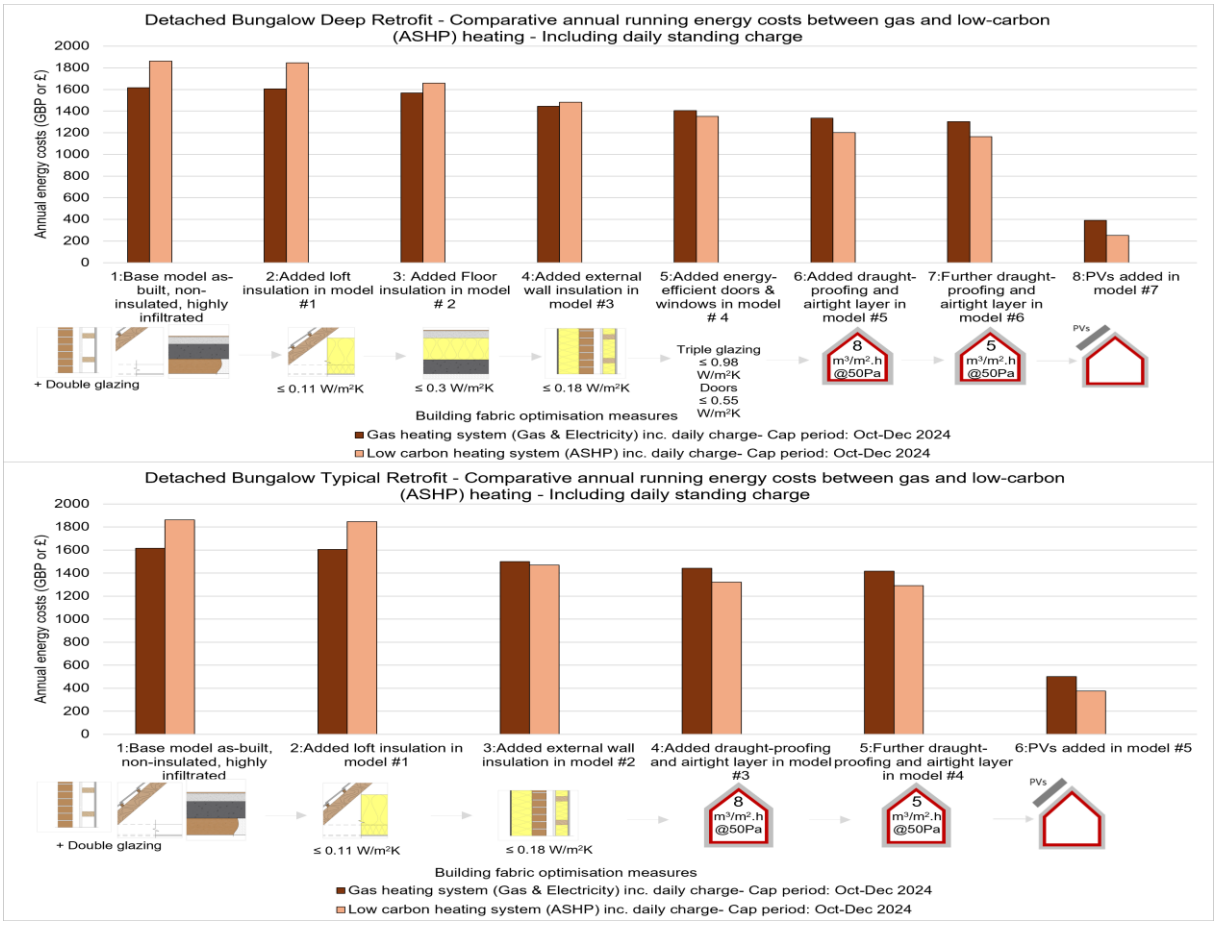


Figure 35: Deep & typical retrofits – heating systems annual costs – Bungalow

4.5 Summary

This section presents a summary of the energy and carbon performance assessment for the specific housing stock, along with a comparative analysis between 'deep retrofit' and 'typical retrofit' scenarios.

The 'deep retrofit' scenario resulted in greater reductions in energy consumption and operational carbon emissions. This is primarily due to the implementation of more extensive fabric upgrades. These upgrades, such as the installation of floor insulation and triple-glazed windows were excluded from the 'typical retrofit' scenario.

Overall energy consumption showed that the 'deep retrofit' scenario achieved a further reduction of approximately 21% from the 'typical retrofit' measures. Additionally, adopting low-carbon heating systems has demonstrated lower energy consumption than traditional gas heating systems. The cost analyses also suggested that they had marginally lower annual costs when compared to the traditional heating system. Moreover, with the UK transitioning to a decarbonised energy system by around 2050, renewable costs are expected to become cheaper than fossil fuels in the coming years, and so will the energy costs.

The most significant fabric measure identified was the implementation of wall insulation, which proved more effective than the other retrofit strategies. This reduction can be attributed to the larger exposed envelope area of the wall insulation compared to other fabric elements.

Table 43 presents a summary of the key results related to annual heating demand, total energy consumption, carbon emissions and estimated annual running costs for the specific housing stock in both 'deep retrofit' and 'typical retrofit' scenarios.

Table 43: Summary of key results related to annual heating demand, total energy consumption, carbon emissions and estimated annual running costs for the detached bungalow archetype.

Detached Bungalow - Deep retrofit/ Typical retrofit									
		1 Base model as-built, non-insulated, highly infiltrated	2 Added loft insulation to model #1	3 Added floor insulation to model #2	4 Added external wall insulation to model #3	5 Added energy-efficient doors & windows to model #4	6 Added draught-proofing and airtight layer to model #5	7 Further draught-proofing and airtight layer to model #6	8 PVs added to model #7
Annual heating demand (kWh/m²a)		89	86/ 86	77/ -	48/ 61	38/ -	22/ 47	14/ 41	-
Total energy consumption (kWh)	Gas heating	11,714	11,569/ 11,569	10,957/ -	8990/ 9877	8364/ -	7244/ 8956	6729/ 8524	2996/ 4791
	ASHP	6692	6627/ 6627	5865/ -	5139/ 5090	4611/ -	3999/ 4484	3846/ 4360	113/ 626
Carbon emissions ($kgCO_{2e}$/yr)	Gas heating	2089	2058/ 2058	1930/ -	1517/ 1703	1385/ -	1150/ 1510	1042/ 1419	721/ 1098
	ASHP	576	570/ 570	504/ -	442/ 438	397/ -	344/ 386	331/ 375	10/ 54
Annual running costs (GBP or £)	Gas heating	1615	1606/ 1606	1567/ -	1445/ 1500	1406/ -	1336/ 1443	1304/ 1416	389/ 501
	ASHP	1862	1846/ 1846	1659/ -	1481/ 1469	1352/ -	1202/ 1321	1165/ 1290	250/ 376

5 Retrofit Specific Housing Embodied Carbon Calculations

In this Section, embodied carbon calculations are undertaken for the specific house-type as defined within Section 4. The same methodology has been adopted, as was specified within Section 3.1.

5.1 Results

Using the base building assumptions as defined within Section 0, an embodied carbon model has been created for the specific house-type. In Table *44* a summary results table is provided, comparing the deep and typical retrofit scenarios.

Table 44: Embodied Carbon Results Summary (Deep and Typical Retrofit)

Property-build type	Generic/ Specific	Type	A1-A5, B1-B5, C1-C4 ($kgCO_2e/m2$)	GIA (m2)	A1-A5, B1-B5, C1-C4 (TCO_2e)
Bungalow	Specific	Deep	240.97	53.50	12.89
	Specific	Typical	173.67	53.50	9.29

Within Table 45, the embodied carbon results for the generic house types (as determined within Section 3) are compared with the results for the specific house-type (bungalow) as set out within Table 44.

Table 45: Embodied Carbon (A1-A5, B1-B5,C1-C4) Results Summary - All House Types (Deep and Typical)

Property-build type	Generic/ Specific	Type	A1-A5, B1-B5,C1-C4 ($kgCO_2e/m2$)	GIA (m2)	A1-A5, B1-B5,C1-C4 (TCO_2e)
Detached	Generic	Deep	138.42	89.90	12.44
	Generic	Typical	97.05	89.90	8.73
Semi-detached	Generic	Deep	136.45	89.90	12.27
	Generic	Typical	86.99	89.90	7.82
Mid-terraced	Generic	Deep	118.99	89.70	10.67
	Generic	Typical	72.57	89.70	6.51
End-terraced	Generic	Deep	128.07	89.70	11.49
	Generic	Typical	85.00	89.70	7.62
Mid-terraced Flat (Whole)	Generic	Deep	108.95	112.90	6.26
	Generic	Typical	108.95	112.90	7.60
End-terraced Flat (Whole)	Generic	Deep	108.95	112.90	12.30
	Generic	Typical	108.95	112.90	7.60
Mid-terraced Flat	Generic	Deep	123.04	50.90	6.26
	Generic	Typical	81.53	50.90	4.15
End-terraced Flat	Generic	Deep	118.34	62.00	7.34
	Generic	Typical	76.82	62.00	4.76

Full data exports are provided in Appendix B: Embodied Carbon Data Exports.Table 45 provides a summary of total embodied carbon emissions only. To understand the embodied carbon impact at Retrofit Stages 1, 2 and 3 (as defined within Section 0), a more detailed breakdown is required. The following Tables and Figures therefore provide the necessary data.

Table 46: Combined Global Warming Potential for Bungalow (Typical Retrofit Scenario)

Category	Global warming potential - non-decarbonised scenario $kgCO_2e$ - Resource types
House Type	Bungalow
Stone wool insulation	42.14
Energy production systems from renewable energy	73.49
HVAC equipment with refrigerant	23.26
Render	14.54
Other site operation	9.24
Refrigerant fluids	7.57
Textiles and wallpapers	2.53
Plastic profiles and products	0.54
HVAC components and equipment	0.35
Total	173.67

Table 47: Combined Global Warming Potential for Bungalow (Deep Retrofit Scenario)

Category	Global warming potential - non-decarbonised scenario $kgCO_2e$ - Resource types
House Type	Bungalow
Stone wool insulation	42.14
Other insulation	35.83
Energy production systems from renewable energy	73.49
HVAC equipment with refrigerant	22.19
Render	14.54
Other site operation	13.83
PVC frame windows	13.10
Refrigerant fluids	7.57
Textiles and wallpapers	13.19
Other resource types	5.07
Total	240.97

To understand the specific embodied carbon impact at Retrofit Stages 1, 2 and 3 (as defined within Section 0), a more detailed breakdown is required, as provided within Table 48.

Table 48: Breakdown by Retrofit Stage for the specific house type (Typical Retrofit Scenario)

	Global Warming Potential ($kgCO_2e/m2$)	Percentage of Total
Retrofit Stage 1 - Fabric	69.00	40%
Retrofit Stage 2 - Low Carbon Heating	31.18	18%
Retrofit Stage 3 - Renewable Technology	73.49	42%
Total	173.67	100%

Table 49: Breakdown by Retrofit Stage for the specific house type (Deep Retrofit Scenario)

	Global Warming Potential ($kgCO_2e/m2$)	Percentage of Total
Retrofit Stage 1 - Fabric	137.71	57%
Retrofit Stage 2 - Low Carbon Heating	29.76	12%
Retrofit Stage 3 - Renewable Technology	73.49	30%
Total	240.97	100%

Using the output data, a series of graphical representations of the results are provided at **Error! R eference source not found.**, Figure 37, Figure 38, Figure 39 and Figure 40.

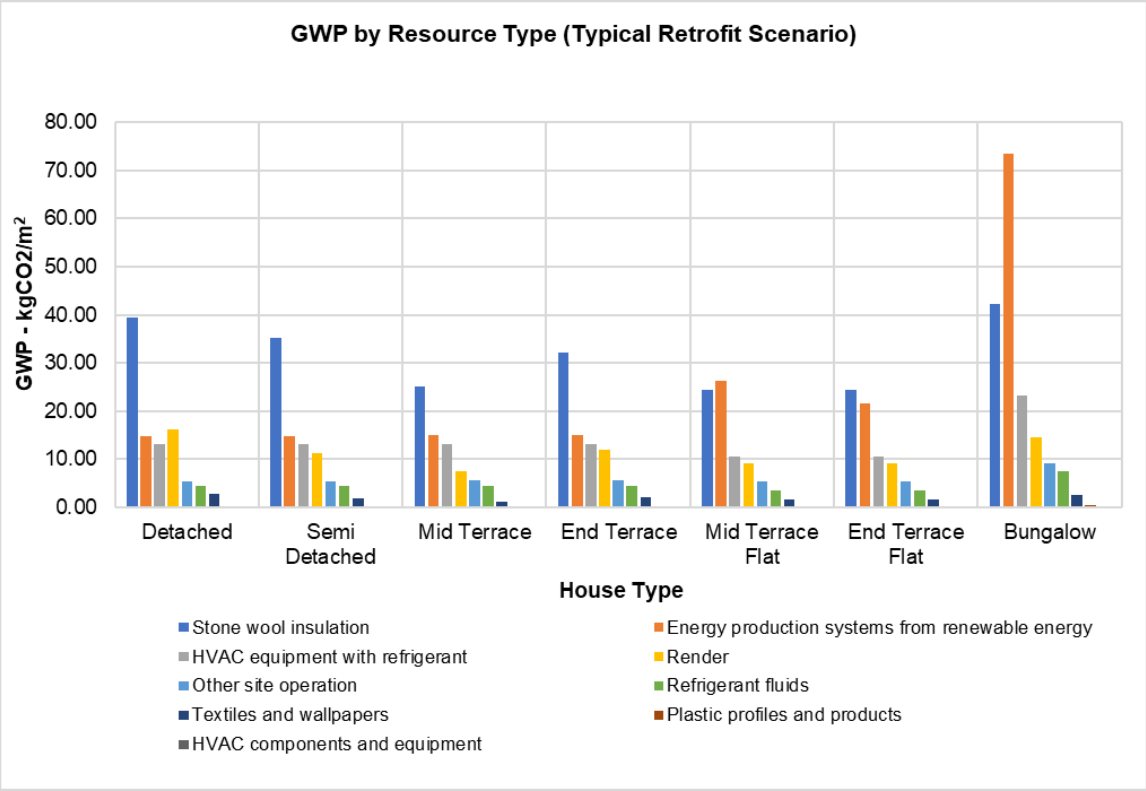


Figure 36: GWP by Resource Type - All House Types (Typical Retrofit)

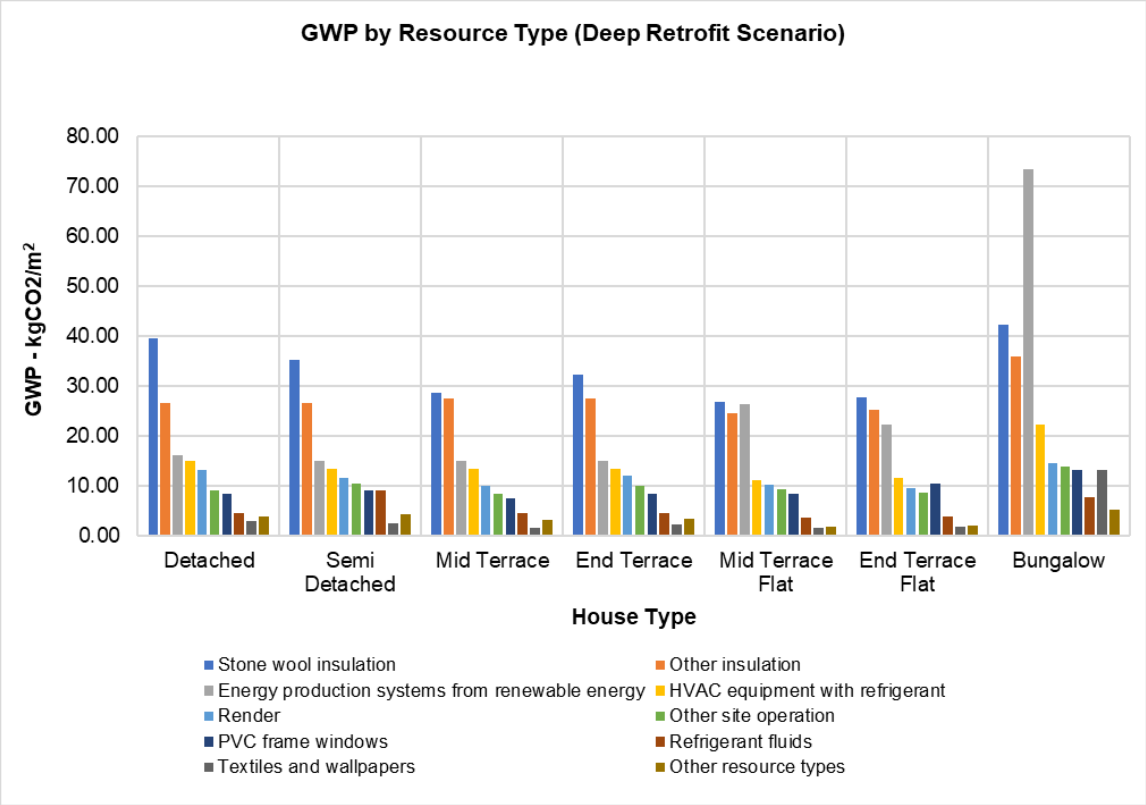


Figure 37: GWP by Resource Type – All House Types (Deep Retrofit Scenario)

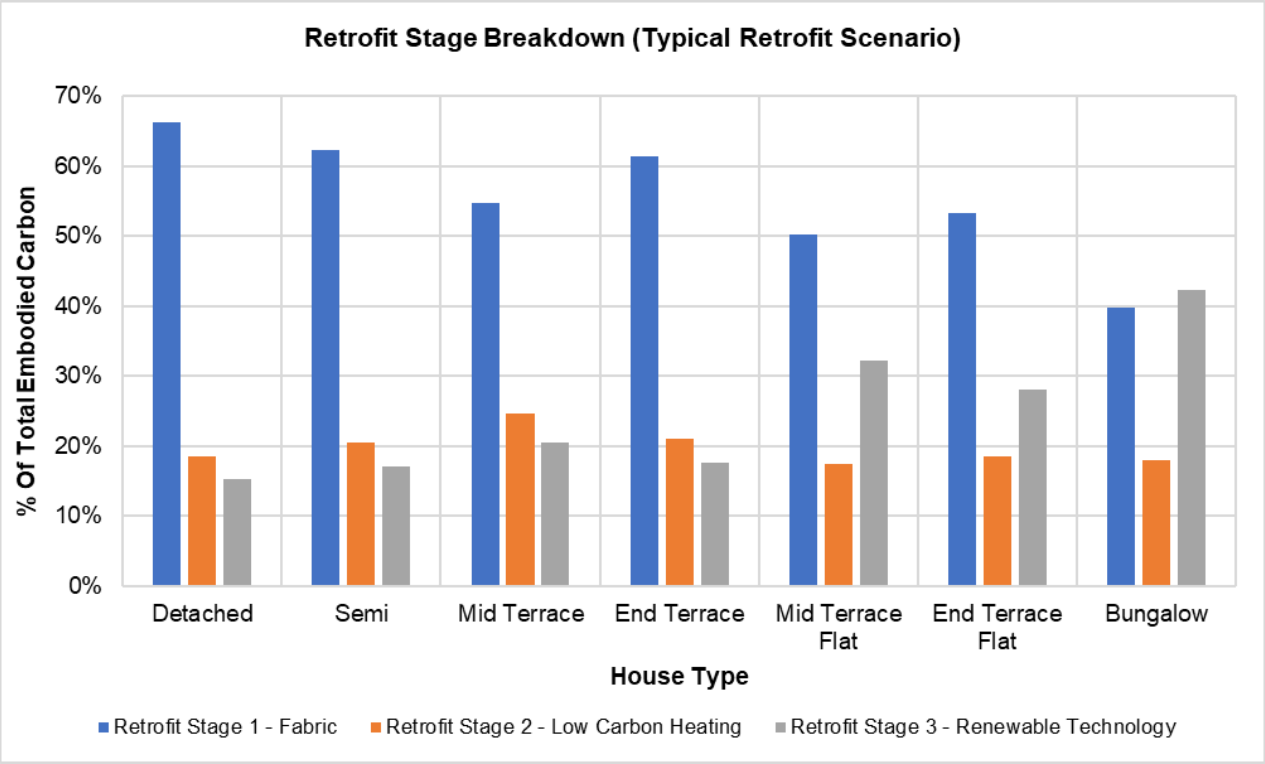


Figure 38: Retrofit Stage Breakdown by Percentage (Typical Retrofit)

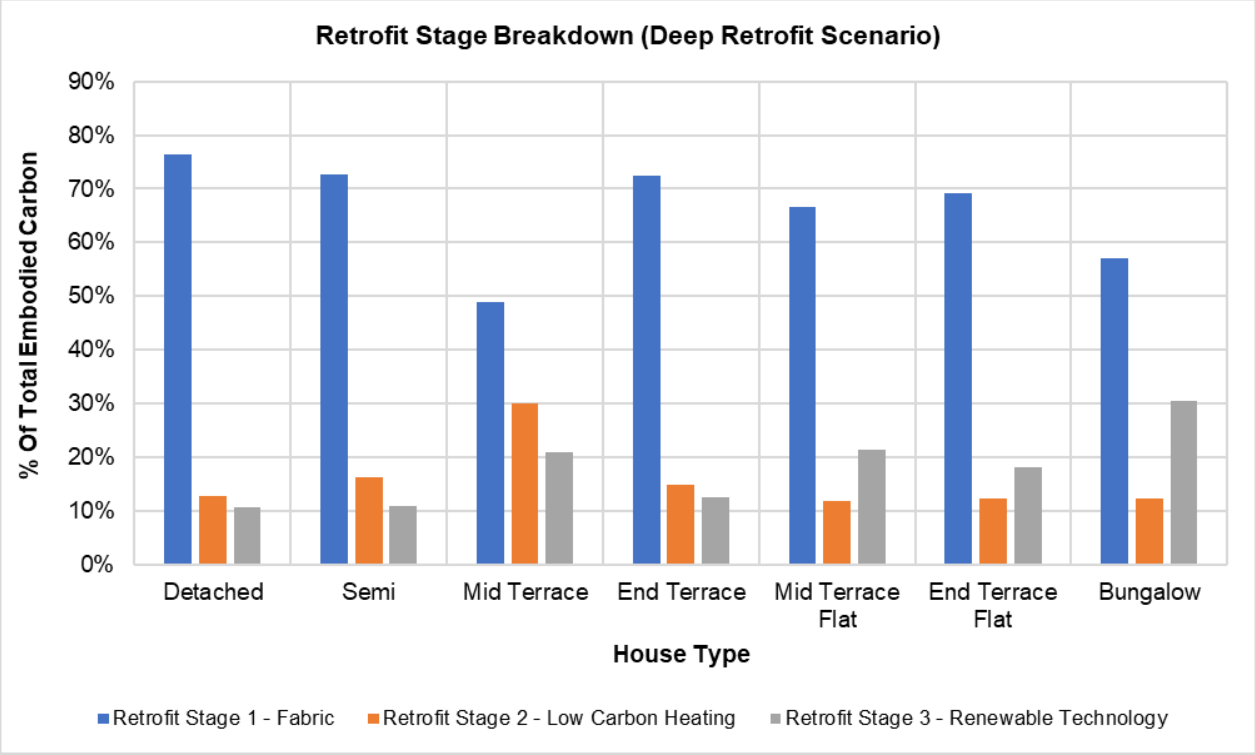


Figure 39: Retrofit Stage Breakdown by Percentage (Deep Retrofit)

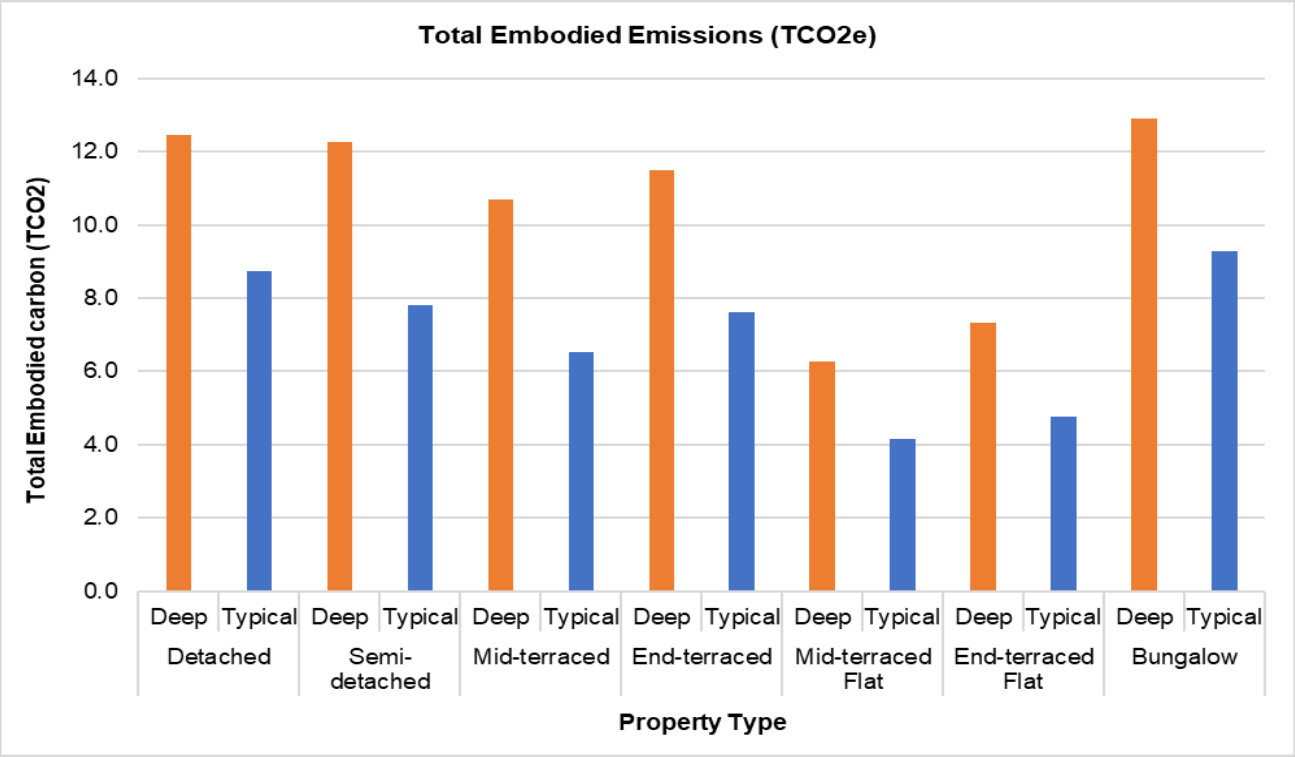


Figure 40: Total Embodied Emissions - All House Types (TCO_2e)

5.2 Summary

For the specific house type, the typical retrofit scenario achieves approximately 70% of the emissions generated by the deep retrofit, which is in line with the findings of the generic house type study. For the bungalow, a typical retrofit will emit approximately 173.7kgCO_2e/m² compared to 241.0kgCO_2e/m² for the deep scenario. Considering all house types, the Global Warming Potential (GWP) per square meter of the property is highest for bungalows. This is driven primarily by the increased quantum of PV at 28m² compared to 10m² for the other property types. Another factor is the high heat loss perimeter surface area, when compared as a ratio to internal floor area. The total embodied carbon emissions of 12.9tonnes and 9.3tonnes for the deep and typical scenarios respectively, are considerably higher than other property types, as illustrated in Table 45.

For the specific house type, renewable energy is the largest contributor to embodied emissions across both retrofit scenarios. Considering the typical scenario, renewable energy accounts for 73.5kgCO_2e/m² or 40% of embodied emissions. The standardisation of HVAC equipment across all property types, results in a comparable total embodied carbon impact, although, on a square-metre basis, emissions are higher.

For the deep retrofit scenario specifically, EPS Floor Insulation within the bungalow emerged as one of the most carbon-intensive additions, contributing 35.8kgCO_2e/m² to the overall emissions. This compares to 26.5kgCO_2e/m² for the Spacetherm Aerogel insulation in the detached house type (generic scenario). This method of floor insulation is less effective in reducing embodied emissions. Additionally, it requires the ground floor level to be altered significantly which can be costly and time consuming.

In conclusion, for the bungalow, implementing a typical retrofit results in a saving of roughly 28% in embodied carbon, compared to the deep retrofit scenario. A deep retrofit results in 12.9tonnes of

CO_2e whereas a typical retrofit generates 9.3tonnes of CO_2e. This additional 3.6tonnes of CO_2e is what must be saved in operational carbon emissions over the lifetime of the property to make the deep retrofit scenario worth pursuing.

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6 Lifetime Capital Cost of Retrofit

In this Section, the Lifetime Capital Cost of deep and typical retrofit is estimated. In general, the assumptions made within this Section align with the materials, specifications, and quantities as set out within Section 2.3 (Building Fabric Optimisation) and Sections 3 and 5 (Embodied Carbon Calculation).

6.1 Assumptions

General

All cost estimations include labour, calculated on a day rate based on the property type and associated floor area. The Reference Study Period (RSP) used within the data analysis is 20-years, which aligns with Section 3.1 (Methodology and Assumptions).

All estimations are VAT exclusive.

Building Fabric Optimisation

For External Wall Insulation (EWI), the build-up includes 230mm of Rockwool External Wall Dual Density Slab, with a Fibreglass Mesh, EWI Premium Dual Basecoat Adhesive, and EWI-075 Silicone Render. For loft insulation, 400mm of Knauf Loft roll 44 has been assumed. For the specific house type, the EWI build-up includes a reduced insulation thickness of 150mm, due to the improved base-build fabric performance.

The application of EWI to both the typical and deep retrofit scenarios results in improvements to air tightness. Additionally, loft hatch strips, letter box and keyhole draft excluders, external door storm guard draft strips and external window calking has been assumed, to improve air tightness to the specified levels.

For deep retrofit, replacement triple glazing is assumed, including adhesives and seals. External window caulking is therefore excluded. For ground floor insulation, the deep retrofit includes 40mm of Spacetherm Aerogel Insulation, finished with 3mm of chipboard and secured with adhesives, nails, and tape. For the specific house type, a different ground floor build up has been assumed due to the age of the property (see Section 4). Therefore, the ground floor insulation strategy assumed for the deep retrofit scenario assumes the removal of the existing screed and EPS insulation and replacement with a like-for-like alternative at an increased thickness of 230mm. The ground floor insulation strategy results in an increased floor level of approximately 200mm. Cost allowances have been made for adjustments to doors, thresholds, and ceilings.

Building fabric measures are assumed to have a life expectancy of 60-years. No system replacements are assumed during the life cycle.

Low-Carbon Heating

A 5kW Mitsubishi Ecodan air-to-water heat pump has been assumed, with a 200L DHW tank suitable for dwellings with 2-3 person occupancy. Both typical and deep retrofit scenarios assume retention of existing radiators, with only minor adjustments to connections and pipework.

It has been established that the introduction of Mechanical Ventilation with Heat Recovery (MVHR) has a negligible impact on energy reduction. That said, the introduction of EWI and other fabric improvements will impact internal humidity levels; increasing the risk of moisture-related fabric

defects. The modelling therefore assumes the introduction of decentralised Mechanical Extract Ventilation (dMEV), which will be demand-controlled to automatically activate according to internal humidity and temperature levels.

Low carbon heating measures are assumed to have a life expectancy of 20-years. No system replacements are assumed during the life cycle.

Renewable Energy Generation

For the detached, semi-detached, and terraced house-types, 5no. Jinko Tiger Neo 440Wp solar panels have been assumed. For the specific house type, 14no. solar panels have been assumed. The capital cost estimations include all system elements including inverter, wiring and connection equipment, monitoring console, and roof mounting. For the ground and first floor flats, it has been assumed that a shared 5no. panel array serves both dwellings.

Renewable energy generation measures are assumed to have a life expectancy of 20-years. No system replacements are assumed during the life cycle.

Incurred Costs

Incurred costs relate to surveys and enabling work, contractor preliminary costs (3%), contractor overhead and profit (8%), and risk allowance (8%). All cost estimations are inclusive of incurred costs.

Enabling works to Roof and Eaves

An additional sum of £3,000 was allocated to account for potential works required to the roof or eaves, ensuring that the insulation could be installed to the appropriate standards. This provision was made to address any structural adjustments or repairs necessary to facilitate proper installation and long-term performance of the insulation system.

6.2 Lifetime Capital Costs

The Lifetime Capital Cost estimations within this Section align with the specifications, materials, and quantities used within the OneClick LCA embodied carbon model, for the associated property type. Costs are taken from supplier data where possible. For incurred costs and other elements where supplier data is not available, benchmark data has been applied from domestic retrofit projects completed in the UK during 2024. Where relevant, costs include end-of life-system replacement, as specified within Section 6.1.

Typical Retrofit – Generic

Within Table 50, the Lifetime Capital Cost for typical retrofit has been estimated, for the generic property types. Further detail and pricing breakdown can be made available upon request.

Table 50 – Lifetime Capital Cost for typical retrofit (generic property types)

	Description	Unit	Quantity	Rate (£/Unit)	Total
Detached	EWI & Air Tightness	m2	159.00	£174.66	Inc. Below
	Loft Insulation	m2	57.60	£20.94	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£35,632.65
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,199.52
	Renewable Energy Generation Sub-Total (Exc. VAT)				£7,968.24

				Combined Total (Exc. VAT)	£55,800.41
Semi-Detached	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	112.00	£174.66	Inc. Below
	Loft Insulation	m2	48.70	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£25,494.28
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£12,288.86
				Renewable Energy Generation Sub-Total (Exc. VAT)	£8,026.59
				Total (Exc. VAT)	£45,809.72
Mid-Terrace	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	72.90	£174.66	Inc. Below
	Loft Insulation	m2	53.20	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£17,301.72
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£12,396.37
				Renewable Energy Generation Sub-Total (Exc. VAT)	£8,096.81
				Total (Exc. VAT)	£37,794.91
End Terrace	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	118.50	£174.66	Inc. Below
	Loft Insulation	m2	53.20	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£26,983.10
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£12,273.32
				Renewable Energy Generation Sub-Total (Exc. VAT)	£8,016.44
				Total (Exc. VAT)	£47,272.86
Mid-Terrace Flat	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	51.70	£174.66	Inc. Below
	Loft Insulation	m2	22.90	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£12,045.35
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£14,230.35
				Renewable Energy Generation Sub-Total (Exc. VAT)	£8,139.49
				Total (Exc. VAT)	£34,208.64
End Terrace Flat	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	63.00	£174.66	Inc. Below
	Loft Insulation	m2	28.00	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£14,581.22
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£14,142.17
				Renewable Energy Generation Sub-Total (Exc. VAT)	£8,109.17
				Total (Exc. VAT)	£36,677.65

Typical Retrofit – Specific (Bungalow)

Within Table 51, the Lifetime Capital Cost for typical retrofit has been estimated, for the specific property type. Further detail and pricing breakdown can be made available upon request.

Table 51 - Lifetime Capital Cost for typical retrofit (specific property type)

Bungalow (Specific)	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	86.70	£137.90	Inc. Below
	Loft Insulation	m2	57.80	£20.94	Inc. Below
				Building Fabric Optimisation Sub-Total (Exc. VAT)	£16,354.11
				Low-Carbon Heating Systems Sub-Total (Exc. VAT)	£12,323.44
				Renewable Energy Generation Sub-Total (Exc. VAT)	£14,190.41
				Combined Total (Exc. VAT)	£42,867.96

Deep Retrofit – Generic

Within Table 52, the Lifetime Capital Cost for deep retrofit has been estimated, for the generic property types. Further detail and pricing breakdown can be made available upon request.

Table 52 - Lifetime Capital Cost for deep retrofit (generic property types)

Detached	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	159.00	£155.80	Inc. Below
	External Windows & Doors	m2	14.97	£389.29	Inc. Below
	Loft Insulation	m2	57.60	£20.94	Inc. Below
	Ground Floor Insulation	m2	48.70	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£68,980.36
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,091.39
	Renewable Energy Generation Sub-Total (Exc. VAT)				£7,897.61
	Combined Total (Exc. VAT)				£88,969.37
Semi-Detached	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	112.0	£155.80	Inc. Below
	External Windows & Doors	m2	15.00	£389.29	Inc. Below
	Loft Insulation	m2	48.70	£20.94	Inc. Below
	Ground Floor Insulation	m2	48.70	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£58,928.37
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,128.48
	Renewable Energy Generation Sub-Total (Exc. VAT)				£7,921.84
	Combined Total (Exc. VAT)				£78,978.68
Mid-Terrace	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	72.90	£155.80	Inc. Below
	External Windows & Doors	m2	16.40	£389.29	Inc. Below
	Loft Insulation	m2	53.20	£20.94	Inc. Below
	Ground Floor Insulation	m2	50.30	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£52,344.72
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,158.43
	Renewable Energy Generation Sub-Total (Exc. VAT)				£7,941.40
	Combined Total (Exc. VAT)				£72,444.55
End Terrace	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	118.50	£155.80	Inc. Below
	External Windows & Doors	m2	16.40	£389.29	Inc. Below
	Loft Insulation	m2	53.20	£20.94	Inc. Below
	Ground Floor Insulation	m2	50.30	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£61,891.85
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,116.59
	Renewable Energy Generation Sub-Total (Exc. VAT)				£7,914.07
	Combined Total (Exc. VAT)				£81,922.51
Mid-Terrace Flat	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	51.70	£155.80	Inc. Below
	External Windows & Doors	m2	9.10	£389.29	Inc. Below
	Loft Insulation	m2	22.90	£20.94	Inc. Below
	Ground Floor Insulation	m2	28.00	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£31,997.08
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£7,033.89
	Renewable Energy Generation Sub-Total (Exc. VAT)				£8,072.49
	Combined Total (Exc. VAT)				£46,921.73
End Terrace Flat	Description	Unit	Quantity	Rate (£/Unit)	Total
	EWI & Air Tightness	m2	63.00	£155.80	Inc. Below
	External Windows & Doors	m2	9.10	£389.29	Inc. Below
	Loft Insulation	m2	28.00	£20.94	Inc. Below

	Ground Floor Insulation	m2	34.00	£447.50	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£37,750.21
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£6,986.19
	Renewable Energy Generation Sub-Total (Exc. VAT)				£8,031.63
	Combined Total (Exc. VAT)				£52,636.83

Deep Retrofit – Specific (Bungalow)

Within Table 53, the Lifetime Capital Cost for typical retrofit has been estimated, for the specific property type. Further detail and pricing breakdown can be made available upon request.

Table 53 - Lifetime Capital Cost for deep retrofit (specific property type)

	Description	Unit	Quantity	Rate (£/Unit)	Total
Bungalow (Specific)	EWI & Air Tightness	m2	86.70	£137.90	Inc. Below
	External Windows & Doors	m2	11.90	£389.29	Inc. Below
	Loft Insulation	m2	57.80	£20.94	Inc. Below
	Ground Floor Insulation	m2	53.50	£184.18	Inc. Below
	Building Fabric Optimisation Sub-Total (Exc. VAT)				£37,704.76
	Low-Carbon Heating Systems Sub-Total (Exc. VAT)				£12,206.73
	Renewable Energy Generation Sub-Total (Exc. VAT)				£14,056.01
	Combined Total (Exc. VAT)				£63,967.49

6.3 Summary

Typical Retrofit

Within

Figure 41, a comparison of Lifetime Capital Cost is provided for the typical retrofit scenario.

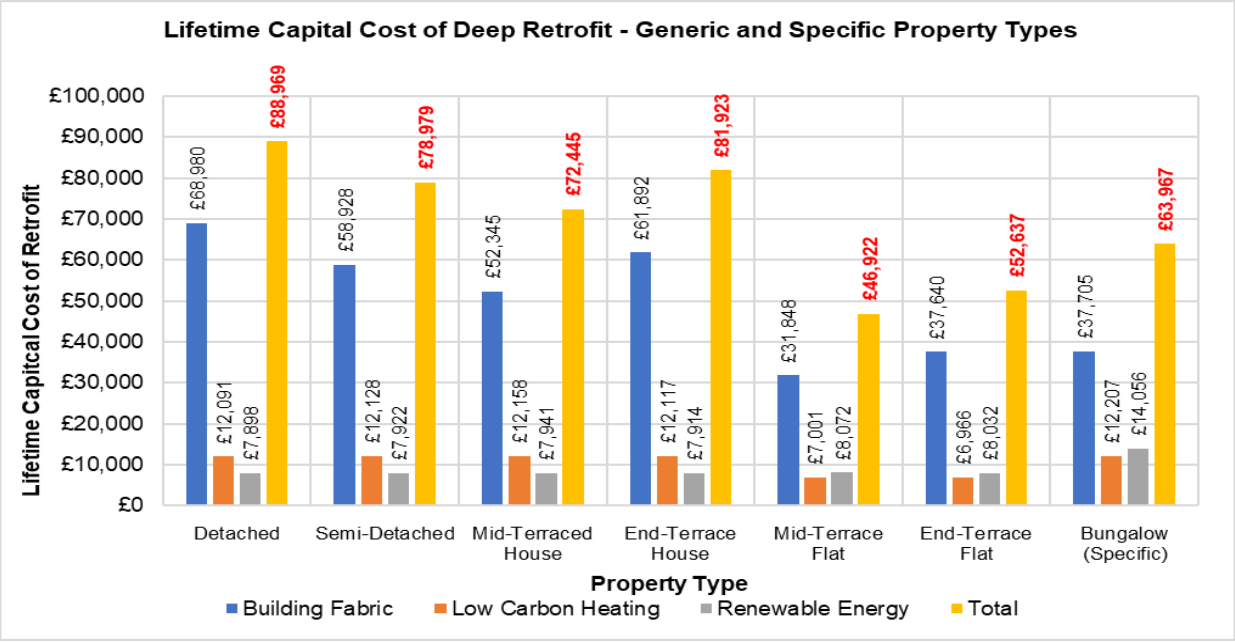


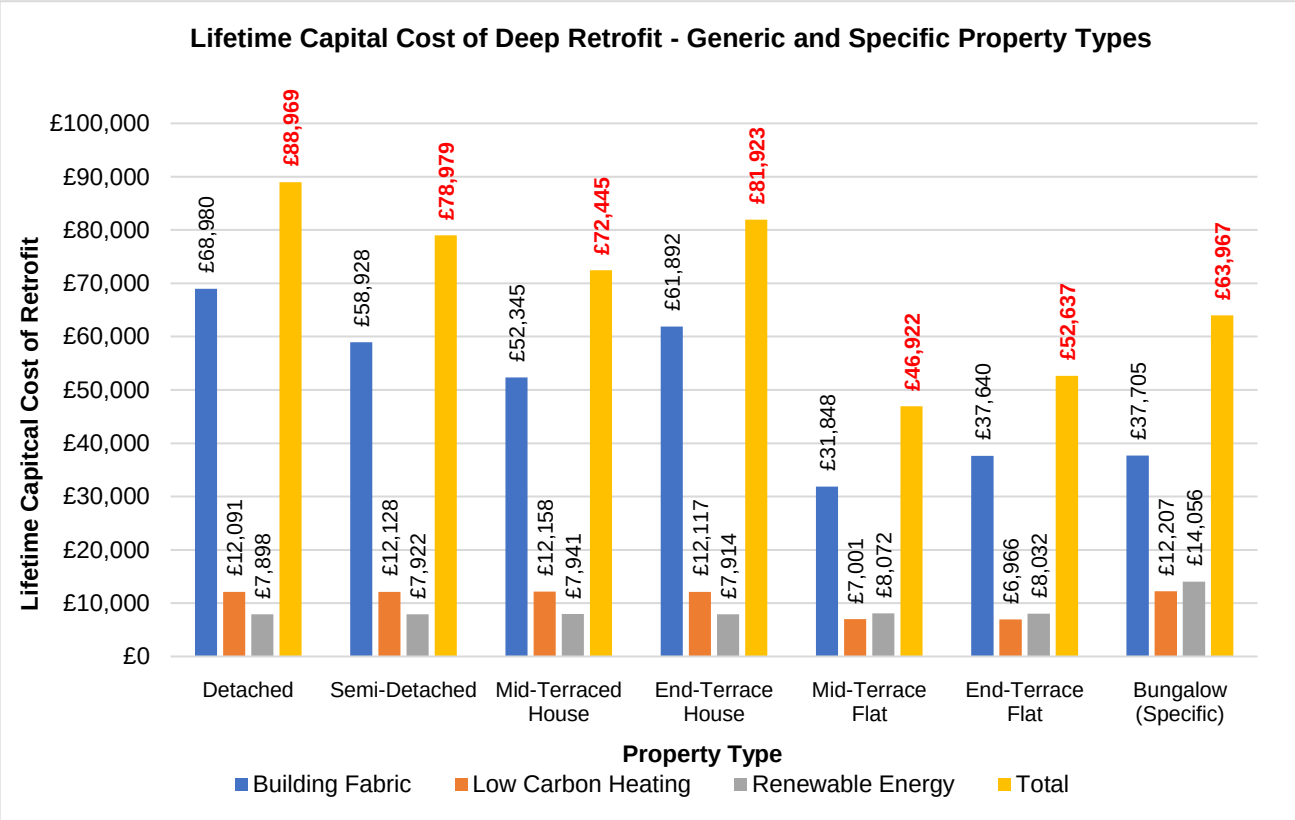
Figure 41 – Lifetime Capital Cost of typical retrofit, generic and specific property type.

Discussion

- For the detached, semi-detached, mid-terrace, end-terrace, and bungalow, the same heating system has been specified. Therefore, the Low Carbon Heating costs are aligned for these property types.
- For the detached, semi-detached, mid-terrace, and end-terrace properties, the same quantum of solar PV has been specified. Therefore, the Renewable Energy costs are aligned.
- The detached, semi-detached, mid-terrace, and end-terrace properties have an internal floor area of 90m^2. For these property types, the Lifetime Capital Cost for typical retrofit ranges from between £37,794 to £55,900 (Exc. VAT), or between £421/m^2 and £621/m^2 (GIA).
- The bungalow has an internal floor area of 54m^2. The Lifetime Capital Cost of typical retrofit for the bungalow is £42,867 or £801/m^2 (GIA).
- The mid-and-end-terraced flats have an internal floor area of 51m^2 and 62m^2, respectively. The Lifetime Capital Cost ranges from £34,208 to £36,377 (Exc. VAT), or between £535/m^2 and £575/m^2 (GIA).
- The variation in Lifetime Capital Cost is primarily driven by the surface area of heat loss perimeter walls and the associated quantity of external wall insulation.

Deep Retrofit

Within Figure *42*, a comparison of Lifetime Capital Cost is provided for the deep retrofit scenario.



Discussion

- For the detached, semi-detached, mid-terrace, end-terrace, and bungalow, the same heating system has been specified. Therefore, the Low Carbon Heating costs are aligned for these property types.
- For the detached, semi-detached, mid-terrace, and end-terrace properties, the same quantum of solar PV has been specified. Therefore, the Renewable Energy costs are aligned.
- The detached, semi-detached, mid-terrace, and end-terrace properties have an internal floor area of 90m^2. For these property types, the Lifetime Capital Cost for deep retrofit ranges from between £88,969 to £72,444 (Exc. VAT), or between £989/m^2 and £803/m^2 (GIA).
- The bungalow has an internal floor area of 54m^2. The Lifetime Capital Cost of typical retrofit for the bungalow is £63,967 or £1,195/m^2 (GIA).
- The mid-and-end-terraced flats have an internal floor area of 51m^2 and 62m^2, respectively. The Lifetime Capital Cost ranges from £42,680 to £49,166 (Exc. VAT), or between £839/ m^2 and £793/m^2 (GIA).
- The variation in Lifetime Capital Cost is primarily driven by the surface area of heat loss perimeter walls and the associated quantity of external wall insulation.
- The increase in Lifetime Capital Cost when compared to the typical retrofit scenario, is due to the introduction of ground floor insulation and new external windows and doors.

7 Net Lifetime Cost of Retrofit

The Net Lifetime Cost of a retrofit project is the Lifetime Capital Cost of the works, less the Lifetime Cost Savings. For example, consider a retrofit project that has a Lifetime Capital Cost of £30,000 – this includes all material and labour costs, incurred costs (enabling works, surveys, contractor overhead and profit, preliminaries, and risk allowances), and maintenance and replacement costs over the Reference Study Period (RSP). Over a 20-year RSP, the retrofit project results in £20,000 of energy bill savings. The Net Lifetime Cost of the installation is therefore £10,000. Where the Lifetime Cost Savings are higher than the Lifetime Capital Cost, the retrofit project results in a Net Lifetime Cost saving.

Within this Section the Net Lifetime Cost of retrofit is determined, using the annual energy costs taken from Sections 2.4 and 4.4, and the Lifetime Capital Cost data from Section 6. Both the typical and deep retrofit scenarios have been analysed according to the following Retrofit Stages:

- Retrofit Stage 1: Building Fabric Optimisation
- Retrofit Stage 2: Low-Carbon Heating Systems
- Retrofit Stage 3: Renewable Energy Generation

7.1 Assumptions

Energy Tariff Projections

There are no definitive projections for future UK Gas and Electricity price caps over the long term, as price forecasting is inherently complex and subject to numerous variables. Future energy prices are influenced by factors such as global fuel markets, geopolitical events, regulatory changes, infrastructure investments, and shifts in energy demand due to electrification and decarbonisation efforts. Given this uncertainty, we have chosen to use the current gas and electricity price caps in our modelling assumptions. As of October to December 2024, the price cap for Electricity is 24.50p per kWh and 6.24p per kWh for Gas. The daily standing charges currently sit at 60.99p and 31.66p for Electricity and Gas respectively (OFGEM, 2024). This approach ensures that our analysis is based on reliable and transparent data rather than speculative projections, which could be subject to significant revisions.

7.2 Net Lifetime Cost of Retrofit

Typical Retrofit – Generic

Within Table 54, the Net Lifetime Cost for typical retrofit has been estimated, for the generic property types.

Table 54 – Net Lifetime Cost for typical retrofit (generic property types)

Property Type	Retrofit Stage	Annual Cost of Energy (£/year)		Financial Savings (£)		Lifetime Capital Cost	Net Lifetime Cost
		Before	After	Annum	Lifetime	(£)	(£)
Detached	Base Case	£2,049.74	£2,049.74	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,049.74	£1,626.47	£423.27	£8,465.43	£35,632.65	£27,167.21
	2.Low-Carbon Heating	£1,626.47	£1,480.86	£145.61	£2,912.26	£12,199.52	£9,287.26
	3.Renewable Energy	£1,480.86	£1,137.20	£343.66	£6,873.23	£7,968.24	£1,095.01
	Totals (Exc. VAT)			£912.55	£18,250.92	£55,800.41	£37,549.49

Semi Detached	Base Case	£2,131.88	£2,131.88	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,131.88	£1,810.64	£321.25	£6,424.95	£25,494.28	£19,069.32
	2.Low-Carbon Heating	£1,810.64	£1,442.25	£368.39	£7,367.78	£12,288.86	£4,921.08
	3.Renewable Energy	£1,442.25	£1,096.97	£345.28	£6,905.57	£8,026.59	£1,121.02
	Totals (Exc. VAT)			£1,034.92	£20,698.30	£45,809.72	£25,111.42
Mid Terrace House	Base Case	£2,277.96	£2,277.96	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,277.96	£1,665.61	£612.36	£12,247.12	£17,301.72	£5,054.59
	2.Low-Carbon Heating	£1,665.61	£1,812.88	-£147.28	-£2,945.56	£12,396.37	£15,341.94
	3.Renewable Energy	£1,812.88	£1,467.43	£345.45	£6,909.00	£8,096.81	£1,187.81
	Totals (Exc. VAT)			£810.53	£16,210.56	£37,794.91	£21,584.35
End Terrace House	Base Case	£2,408.22	£2,408.22	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,408.22	£1,709.42	£698.81	£13,976.10	£26,983.10	£13,007.00
	2.Low-Carbon Heating	£1,709.42	£1,817.51	-£108.10	-£2,161.95	£12,273.32	£14,435.27
	3.Renewable Energy	£1,817.51	£1,472.06	£345.45	£6,909.00	£8,016.44	£1,107.44
	Totals (Exc. VAT)			£936.16	£18,723.15	£47,272.86	£28,549.71
Mid Terrace Flat	Base Case	£1,763.10	£1,763.10	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,763.10	£1,403.42	£359.67	£7,193.47	£12,114.17	£4,920.70
	2.Low-Carbon Heating	£1,403.42	£1,214.45	£188.98	£3,779.55	£7,155.83	£3,376.28
	3.Renewable Energy	£1,214.45	£869.51	£344.94	£6,898.71	£8,250.85	£1,352.14
	Totals (Exc. VAT)			£893.59	£17,871.73	£27,520.84	£9,649.11
End Terrace Flat	Base Case	£1,915.95	£1,915.95	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,915.95	£1,543.45	£372.50	£7,450.06	£14,671.43	£7,221.37
	2.Low-Carbon Heating	£1,543.45	£1,363.95	£179.50	£3,590.02	£7,114.83	£3,524.82
	3.Renewable Energy	£1,363.95	£1,019.01	£344.94	£6,898.71	£8,203.58	£1,304.87
	Totals (Exc. VAT)			£896.94	£17,938.79	£29,989.85	£12,051.06

NOTE: Data rounded to two decimal places – for accurate data see data source: Develeco BBC Data

Typical Retrofit – Specific (Bungalow)

Within Table 55, the Net Lifetime Cost for typical retrofit has been estimated, for the specific property type.

Table 55 - Net Lifetime Cost for typical retrofit (specific property type)

Property Type	Retrofit Stage	Annual Cost of Energy (£/year)		Financial Savings (£)		Lifetime Capital Cost	Net Lifetime Cost
		Before	After	Annum	Lifetime	(£)	(£)
Bungalow (Specific)	Base Case	£1,615.13	£1,615.13	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,615.13	£1,416.08	£199.04	£3,980.87	£16,354.11	£12,373.24
	2.Low-Carbon Heating	£1,416.08	£1,290.91	£125.17	£2,503.40	£12,323.44	£9,820.04
	3.Renewable Energy	£1,290.91	£376.18	£914.73	£18,294.64	£14,190.41	-£4,104.23
	Totals (Exc. VAT)			£1,238.95	£24,778.91	£42,867.96	£18,089.05

Deep Retrofit – Generic

Within Table 56, the Net Lifetime Cost for deep retrofit has been estimated, for the generic property types.

Table 56 - Net Lifetime Cost for deep retrofit (generic property types)

Property Type	Retrofit Stage	Annual Cost of Energy (£/year)		Financial Savings (£)		Lifetime Capital Cost (£)	Net Lifetime Cost (£)
		Before	After	Annum	Lifetime		
Detached	Base	£2,049.74	£2,049.74	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,049.74	£1,477.81	£571.93	£11,438.67	£68,980.36	£57,541.70

	2.Low-Carbon Heating	£1,477.81	£1,272.12	£205.69	£4,113.82	£12,091.39	£7,977.57
	3.Renewable Energy	£1,272.12	£928.46	£343.66	£6,873.23	£7,897.61	£1,024.38
	Totals (Exc. VAT)			£1,121.29	£22,425.72	£88,969.37	£66,543.65
Semi-Detached	Base Case	£2,131.88	£2,131.88	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,131.88	£1,659.65	£472.24	£9,444.74	£58,928.37	£49,483.63
	2.Low-Carbon Heating	£1,659.65	£1,230.74	£428.91	£8,578.16	£12,128.48	£3,550.32
	3.Renewable Energy	£1,230.74	£885.46	£345.28	£6,905.57	£7,921.84	£1,016.27
	Totals (Exc. VAT)			£1,246.42	£24,928.47	£78,978.68	£54,050.21
Mid Terrace House	Base	£2,277.96	£2,277.96	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,277.96	£1,526.06	£751.90	£15,038.03	£52,344.72	£37,306.69
	2.Low-Carbon Heating	£1,526.06	£1,526.06	£0.00	-£0.04	£12,158.43	£12,158.47
	3.Renewable Energy	£1,526.06	£1,180.61	£345.45	£6,909.00	£7,941.40	£1,032.40
	Totals (Exc. VAT)			£1,097.35	£21,946.99	£72,444.55	£50,497.56
End Terrace House	Base	£2,408.22	£2,408.22	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£2,408.22	£1,541.74	£866.48	£17,329.60	£61,891.85	£44,562.25
	2.Low-Carbon Heating	£1,541.74	£1,543.58	-£1.84	-£36.76	£12,116.59	£12,153.35
	3.Renewable Energy	£1,543.58	£1,198.13	£345.45	£6,909.00	£7,914.07	£1,005.07
	Totals (Exc. VAT)			£1,210.09	£24,201.84	£81,923.51	£57,720.67
Mid Terrace Flat	Base	£1,763.10	£1,763.10	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,763.10	£1,292.30	£470.80	£9,415.91	£31,848.11	£22,432.20
	2.Low-Carbon Heating	£1,292.30	£1,090.26	£202.05	£4,040.92	£7,001.14	£2,960.22
	3.Renewable Energy	£1,090.26	£745.32	£344.94	£6,898.71	£8,072.49	£1,173.78
	Totals (Exc. VAT)			£1,017.78	£20,355.54	£42,680.73	£26,566.19
End Terrace Flat	Base	£1,915.95	£1,915.95	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,915.95	£1,334.57	£581.38	£11,627.62	£37,639.50	£26,011.88
	2.Low-Carbon Heating	£1,334.57	£1,130.53	£204.03	£4,080.69	£6,965.70	£2,885.01
	3.Renewable Energy	£1,130.53	£785.60	£344.94	£6,898.71	£8,031.63	£1,132.92
	Totals (Exc. VAT)			£1,130.35	£22,607.02	£49,167.83	£30,029.82

Deep Retrofit – Specific (Bungalow)

Within Table 57, the Net Lifetime Cost for typical retrofit has been estimated, for the specific property type.

Table 57 - Net Lifetime Cost for deep retrofit (specific property type)

Property Type	**Retrofit Stage**	**Annual Cost of Energy (£/year)**		**Financial Savings (£)**		**Lifetime Capital Cost (£)**	**Net Lifetime Cost (£)**
		Before	**After**	**Annum**	**Lifetime**		
Bungalow (Specific)	Base	£1,615.13	£1,615.13	£0.00	£0.00	£0.00	£0.00
	1.Building Fabric	£1,615.13	£1,304.09	£311.04	£6,220.78	£37,704.76	£31,483.98
	2.Low-Carbon Heating	£1,304.09	£1,165.03	£139.06	£2,781.11	£12,206.73	£9,425.62
	3.Renewable Energy	£1,165.03	£250.30	£914.73	£18,294.64	£14,056.01	-£4,238.63
	Totals (Exc. VAT)			£1,364.83	£27,296.53	£63,967.49	£36,670.96

7.3 Summary

Typical Retrofit

Within Figure 43, a comparison of Net Lifetime Cost is provided for the typical retrofit scenario.

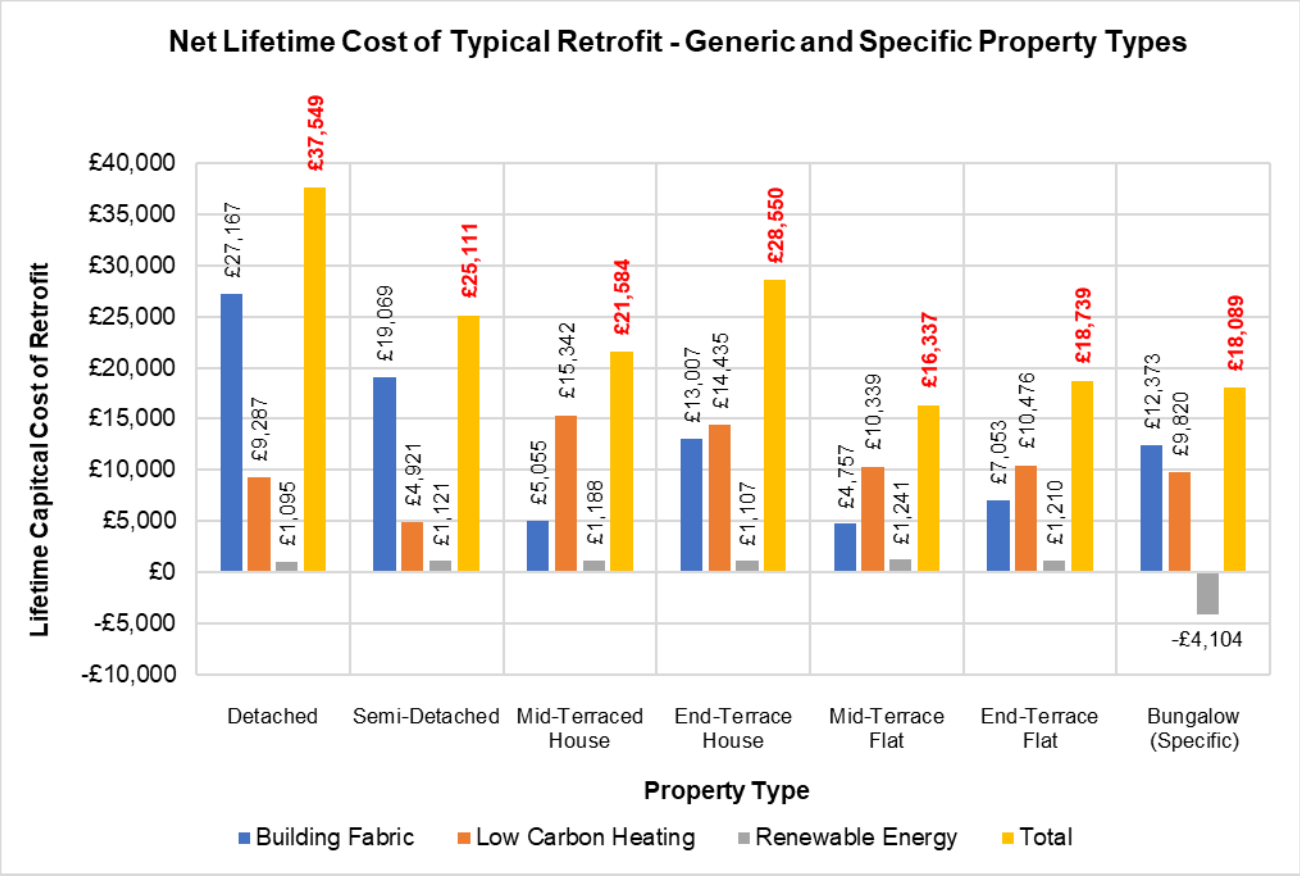


Figure 43 – Net Lifetime Cost of typical retrofit, generic and specific property types

Discussion

- For all property types with the exception of the bungalow, Renewable Energy installations do not provide a Net Lifetime Cost saving, over the 20-year RSP.
- Only the bungalow sees a net lifetime saving from PV.
- For all property types, the building fabric upgrades do not result in a Net Lifetime Cost saving, which is driven by the surface area of heat loss perimeter walls.
- The detached, semi-detached, mid-terrace, and end-terrace properties have a Net Lifetime Cost of between £21,584 and £37,549
- The bungalow has a Net Lifetime Cost of £18,089.
- The mid-and-end-terraced flats both result in a Net Lifetime Cost of between £12,096 and £15,269 over a 20-year RSP.

Deep Retrofit

Within

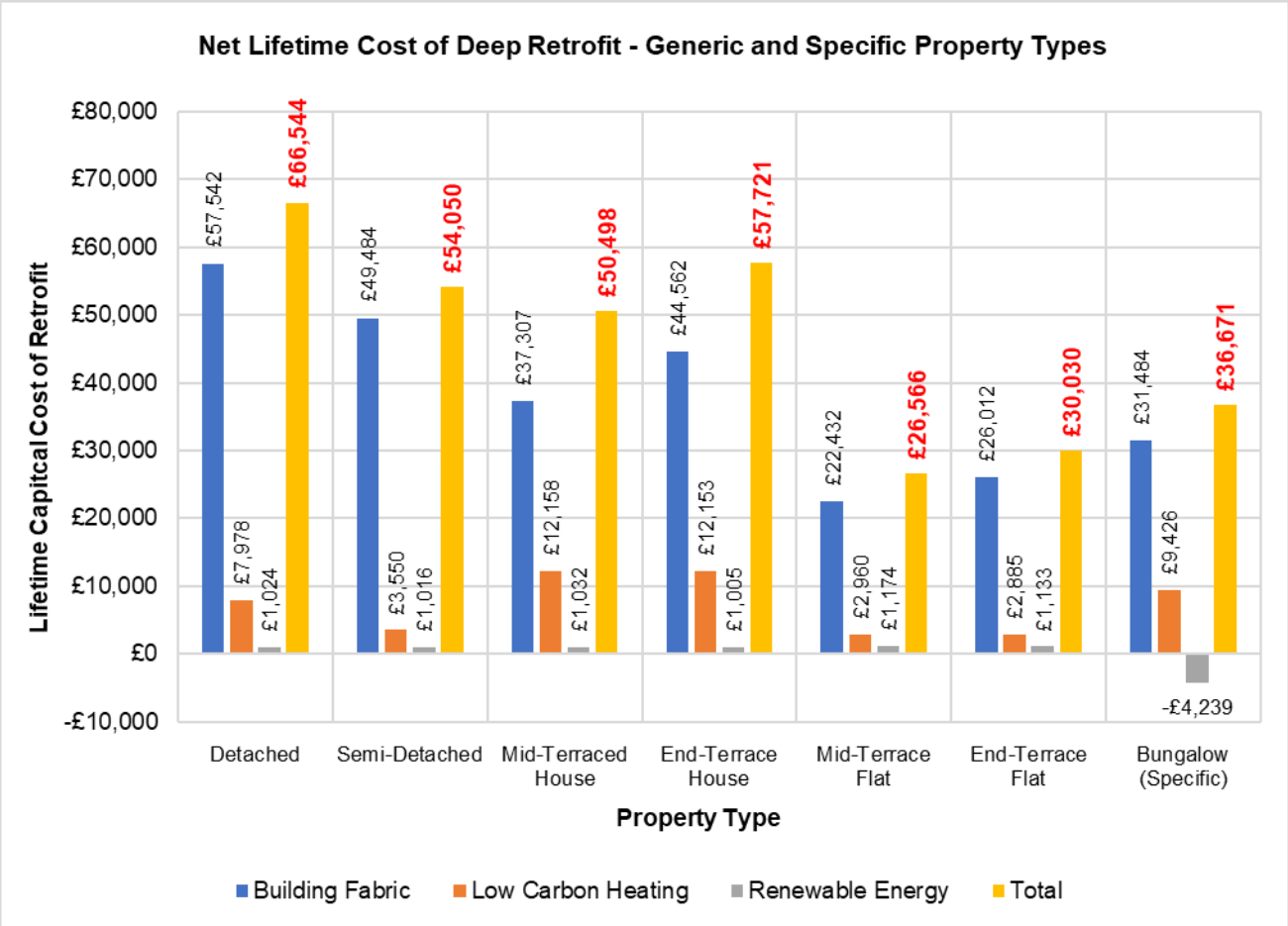


Figure 44, a comparison of Net Lifetime Cost is provided for the deep retrofit scenario.

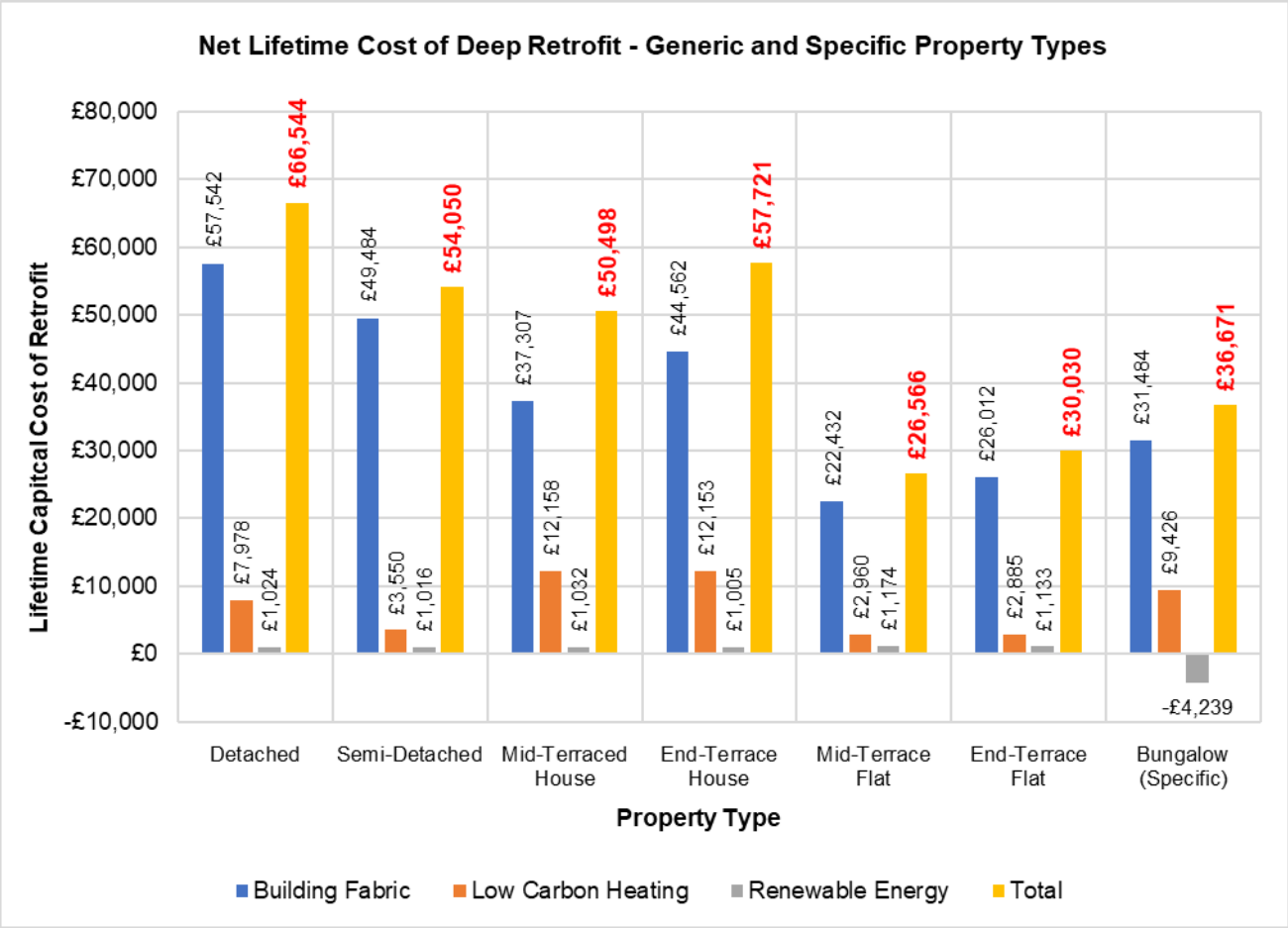


Figure 44 – Net Lifetime Cost of deep retrofit, generic and specific property types

Discussion

- For all property types with the exception of the bungalow, Renewable Energy installations do not provide a Net Lifetime Cost saving, over the 20-year RSP.
- Only the bungalow sees a net lifetime saving from PV due to the increased quantum and associated energy cost savings.
- With the deep retrofit scenario, there are no Net Lifetime Cost savings associated with the building fabric upgrades. This is driven by the introduction of ground floor insulation and window replacement, which have a high-cost impact.
- The detached, semi-detached, mid-terrace, and end-terrace properties have a Net Lifetime Cost of between £50,498 and £66,544.
- The bungalow has a Net Lifetime Cost of £36,671.
- The mid-and-end-terraced flats both result in a Net Lifetime Cost saving of between £22,325 and £26,560 over a 20-year RSP.

8 Carbon-Cost Effectiveness

This Section considers the Carbon Cost Effectiveness (CCE) of retrofit. CCE is a way of measuring the cost per tonne of Carbon Dioxide equivalent that is removed from the atmosphere over the lifetime of a project, as a result of a retrofit installation. CCE is measured in £/tCO_2e and requires base case

or ‘pre-retrofit’ carbon emission data, so that carbon reductions can be determined. A retrofit project with a Net Lifetime Cost of £100,000 that results in a Net Lifetime Carbon Reduction of 200tonnes over its lifetime (20-years) would have a CCE of £500/tCO_2e.

The CCE calculation methodology proposed by the Retrofit Academy is used within this Section. Figure 45 provides a graphical representation of the calculation.

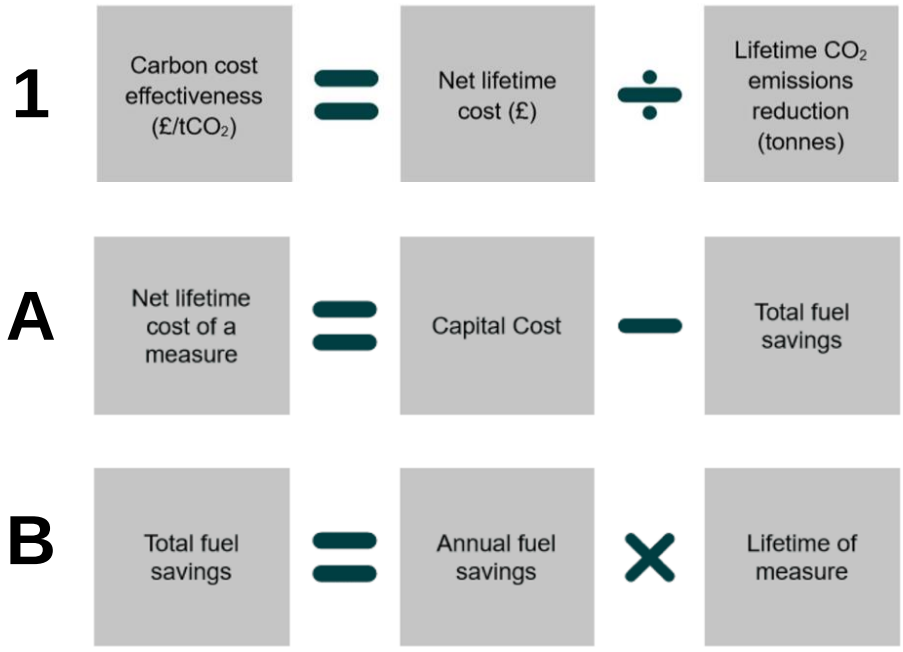


Figure 45 – Retrofit Academy simplified methodology for calculating Carbon Cost Effectiveness (Rickaby, 2020)

8.1 Assumptions

Carbon Intensity of Electricity

There are clear projections indicating that the carbon intensity of the UK electricity grid will decrease significantly over the next 20 years, reflecting the nation's ongoing transition to low-carbon energy sources and the decarbonisation of the power sector. While general trends and targets are outlined in the UK's decarbonisation strategy, the ‘Valuation of Energy Use and Greenhouse Gas Emissions for Appraisal’ publication provides detailed, government-endorsed projections for the carbon intensity of electricity generation (GOV, 2023).Therefore, we have chosen to use the projected data from this source and applied these values over the Reporting Service Period (RSP) of 20 years. Projected grid carbon intensity figures until 2045 are detailed in

Table *58*.

Table 58 – Grid Carbon Intensity Projections (GOV, 2023)

Year	Factor ($kgCO_2e/kWh$)	Year	Factor ($kgCO_2e/kWh$)	Year	Factor ($kgCO_2e/kWh$)
2025 (FHS Aligned)	0.086	2032	0.033	2039	0.017
2026 (FHS Aligned)	0.086	2033	0.026	2040	0.016
2027	0.073	2034	0.021	2041	0.015
2028	0.063	2035	0.020	2042	0.015
2029	0.054	2036	0.020	2043	0.009
2030	0.049	2037	0.018	2044	0.008
2031	0.042	2038	0.018	2045	0.008

Carbon Intensity of Gas

There are no specific projections for the carbon intensity of the UK's domestic gas supply over the next 20 years. The UK's decarbonisation strategy primarily focuses on reducing overall greenhouse gas emissions and transitioning to low-carbon energy sources, rather than providing detailed projections for the carbon intensity of specific fuels like natural gas. The International Energy Agency (IEA) offer detailed data on current emissions and discuss trends in carbon intensities, but they do not provide specific projections for the carbon intensity of UK natural gas over the next 20 years. We have therefore taken the FHS Fuel Factor of 0.214kgCO_2e/kWh as set out within the Home Energy Model and used this value over the RSP of 20 years (DofE, 2023).

8.2 Net Lifetime Carbon Reduction

To complete the CCE calculation, the Net Lifetime Carbon Reduction must be determined. The Net Lifetime Carbon Reduction is calculated by deducting the Whole Life Embodied Carbon (Sections 3 and 5) from the Whole Life Operational Carbon Savings (Sections 2.4 and 4.4).

Typical Retrofit – Generic

Table 59, the Net Lifetime Carbon Reduction for typical retrofit has been estimated, for the generic property types.

Table 59 – Net Lifetime Carbon Reduction of typical retrofit (generic property types)

Property Type	Retrofit Stage	Operational Carbon Emissions ($kgCO_2e$/year)		Operational Carbon Savings ($kgCO_2e$)		Whole Life Embodied Carbon ($kgCO_2e$)	Net Lifetime Carbon Reduction ($kgCO_2e$)
		Before	After	Avg. Year	Lifetime		
Detached	Base	3,169.53	3,169.53	0.00	0.00	0.00	0.00
	1.Building Fabric	3,169.53	1,717.92	1,451.60	29,032.10	5,775.35	23,256.74
	2.Low-Carbon Heating	1,717.92	178.93	,1538.99	30,779.74	1,610.92	29,168.82
	3.Renewable Energy	178.93	130.06	48.87	977.44	1,338.86	-361.42
	Totals			3,039.46	60,789.27	8,725.13	52,064.14
	Base	2,731.78	2,731.78	0.00	0.00	0.00	0.00

Semi Detached	Building Fabric	2,731.78	1,630.06	1,101.71	22,034.30	4,870.21	17,164.08
	Low-Carbon Heating	1,630.06	173.44	1,456.62	29,132.35	1,610.92	2,7521.43
	Renewable Energy	173.44	124.34	49.10	982.03	1,338.86	-356.83
	Totals			2,607.43	52,149.68	7,819.99	44,328.69
Mid Terrace House	Base	3,830.18	3,830.18	0.00	0.00	0.00	0.00
	1.Building Fabric	3,830.18	1,730.11	2,100.07	4,2001.35	3,560.18	38,441.17
	2.Low-Carbon Heating	1,730.11	226.15	1,503.96	30,079.21	1,610.92	28,468.29
	3.Renewable Energy	226.15	177.02	49.13	982.52	1,338.86	-356.34
	Totals			3,653.15	73,063.09	6,509.96	66,553.12
End Terrace House	Base	4,276.90	4,276.90	0.00	0.00	0.00	0.00
	1.Building Fabric	4,276.90	1,880.36	2,396.54	47,930.86	4,674.37	43,256.50
	2.Low-Carbon Heating	1,880.36	226.81	1,653.55	33,071.03	1,610.92	31,460.11
	3.Renewable Energy	226.81	177.68	49.13	982.52	1,338.86	-356.34
	Totals			4,099.22	81,984.42	7,624.15	74,360.27
Mid Terrace Flat	Base	2,706.59	2,706.59	0.00	0.00	0.00	0.00
	1.Building Fabric	2,706.59	,1473.10	1,233.50	24,669.92	2,084.97	22,584.95
	2.Low-Carbon Heating	1,473.10	141.05	1,332.05	26,640.96	726.27	2,5914.69
	3.Renewable Energy	141.05	91.99	49.05	981.06	1,338.86	-357.80
	Totals			2,614.60	52,291.94	4,150.10	48,141.85
End Terrace Flat	Base	3,174.50	3,174.50	0.00	0.00	0.00	0.00
	1.Building Fabric	3,174.50	1,897.00	1,277.49	25,549.89	2,539.43	23,010.46
	2.Low-Carbon Heating	1,897.00	162.31	1,734.70	34,693.93	884.65	33,809.28
	3.Renewable Energy	162.31	113.25	49.05	981.06	1,338.86	-357.80
	Totals			3,061.24	61,224.87	4,762.94	56,461.93

NOTE: Data rounded to two decimal places – for accurate data see data source: Develeco BBC Data

Typical Retrofit – Specific (Bungalow)

Within Table 60, the Net Lifetime Carbon Reduction for typical retrofit has been estimated, for the specific property type.

Table 60 - Net Lifetime Carbon Reduction of typical retrofit (specific property type)

Property Type	**Retrofit Stage**	**Operational Carbon Emissions ($kgCO_2e$/year)**		**Operational Carbon Savings ($kgCO_2e$)**		**Whole Life Embodied Carbon ($kgCO_2e$)**	**Net Lifetime Carbon Reduction ($kgCO_2e$)**
		Before	**After**	**Avg. Year**	**Lifetime**		
Bungalow (Specific)	Base	1,971.20	19,71.20	0.00	0.00	0.00	0.00
	Building Fabric	1,971.20	1,288.58	682.62	13,652.34	3,691.53	9,960.82
	Low-Carbon Heating	1,288.58	151.92	1,136.66	22,733.16	1,668.14	21,065.02
	Renewable Energy	151.92	21.84	130.08	2601.66	3,931.86	-1,330.20
	Totals			1,949.36	38,987.17	9,291.52	29,695.65

Deep Retrofit – Generic

Within Table 61, the Net Lifetime Carbon Reduction for deep retrofit has been estimated, for the generic property types.

Table 61 - Net Lifetime Carbon Reduction of deep retrofit (generic property types)

Property Type	Retrofit Stage	Operational Carbon Emissions ($kgCO_2e$/year)		Operational Carbon Savings ($kgCO_2e$)		Whole Life Embodied Carbon ($kgCO_2e$)	Net Lifetime Carbon Reduction ($kgCO_2e$)
		Before	After	Avg. Year	Lifetime		
Detached	Base	3,169.53	3,169.53	0.00	0.00	0.00	0.00
	1.Building Fabric	3,169.53	1,208.09	1,961.44	39,228.77	9513.14	29715.63
	2.Low-Carbon Heating	1208.09	149.25	1,058.84	21,176.76	1,592.39	19,584.37
	3.Renewable Energy	149.25	100.38	48.87	977.44	1,338.86	-361.42
	Totals			3,069.15	61,,382.96	12444.39	48,938.57
Semi-Detached	Base Case	2,731.78	2,731.78	0.00	0.00	0.00	0.00
	Building Fabric	2,731.78	1,112.24	1,619.53	32,390.61	8,920.16	23,470.45
	Low-Carbon Heating	1,112.24	143.36	968.88	19,377.60	2,003.48	17,374.12
	Renewable Energy	143.36	94.26	49.10	982.03	1343.30	-361.26
	Total			2,637.51	52,750.25	12,266.93	40,483.32
Mid Terrace House	Base	3,830.18	3,830.18	0.00	0.00	0.00	0.00
	1.Building Fabric	3,830.18	1,251.54	2,578.64	51,572.72	7,742.52	43,830.19
	2.Low-Carbon Heating	1,251.54	185.36	1,066.18	21,323.62	1,592.39	19,731.23
	3.Renewable Energy	185.36	136.24	49.13	982.52	1,338.86	-356.34
	Totals			3,693.94	73,878.86	10,673.77	63,205.09
End Terrace House	Base	4,276.90	4,276.90	0.00	0.00	0.00	0.00
	1.Building Fabric	4,276.90	1,305.32	2,971.58	59,431.65	8,556.90	50,874.75
	2.Low-Carbon Heating	1,305.32	187.85	1,117.47	22,349.36	1,592.39	20,756.97
	3.Renewable Energy	187.85	138.73	49.13	982.52	1,338.86	-356.34
	Totals			4,138.18	82,763.54	11,488.15	71,275.38
Mid Terrace Flat	Base	2,706.59	2,706.59	0.00	0.00	0.00	0.00
	1.Building Fabric	2,706.59	1,092.00	1,614.59	32,291.74	4,173.96	28,117.78
	2.Low-Carbon Heating	1,092.00	123.39	968.62	19,372.36	750.15	1,8622.21
	3.Renewable Energy	123.39	74.33	49.05	981.06	1,338.86	-357.80
	Totals			2,632.26	52,645.16	6,262.97	46,382.19
End Terrace Flat	Base	3,174.50	3,174.50	0.00	0.00	0.00	0.00
	1.Building Fabric	3,174.50	1,180.66	1,993.84	39,876.76	5,084.20	34,792.56
	2.Low-Carbon Heating	1,180.66	129.11	1,051.55	21,030.92	913.74	20,117.18
	3.Renewable Energy	129.11	80.06	49.05	981.06	1,338.86	-357.80
	Totals			3,094.44	61,888.74	7336.80	54551.94

Deep Retrofit – Specific (Bungalow)

Within Table 62, the Net Lifetime Carbon Reduction for typical retrofit has been estimated, for the specific property type.

Table 62 - Net Lifetime Carbon Reduction of deep retrofit (specific property type)

Property Type	Retrofit Stage	Operational Carbon Emissions ($kgCO_2e$/year)		Operational Carbon Savings ($kgCO_2e$)		Whole Life Embodied Carbon ($kgCO_2e$)	Net Lifetime Carbon Reduction ($kgCO_2e$)
		Before	After	Avg. Year	Lifetime		
Bungalow (Specific)	Base	1971.20	1971.20	0.00	0.00	0.00	0.00
	Building Fabric	1971.20	904.49	1066.70	21334.09	7367.72	13966.37
	Low-Carbon Heating	904.49	134.02	770.47	15409.44	1592.39	13817.06
	Renewable Energy	134.02	3.94	130.08	2601.66	3931.86	-1330.20
	Total			1967.26	39345.20	12891.97	26453.23

8.3 Carbon Cost Effectiveness: Results

The last step in the CCE calculation is to divide the Net Lifetime Cost of retrofit by the Net Lifetime Carbon Reduction. This will provide a CCE metric in pounds per tonne of carbon saved, over the lifetime of the project. The CCE results will facilitate an understanding as to the most cost-effective retrofit measures, from a carbon reduction standpoint.

Typical Retrofit – Generic

Within Table 63, the Carbon Cost Effectiveness for typical retrofit has been estimated, for the generic property types.

Table 63 – Carbon Cost Effectiveness of typical retrofit (generic property types)

Property Type	Retrofit Stage	Net Lifetime Carbon Reduction ($kgCO_2e$)	Net Lifetime Cost (£)	Carbon Cost Effectiveness (£/tCO_2e)
Detached	Base	0.00	£0.00	N/A
	1.Building Fabric	23,256.74	£27,167.21	£1,168.14
	2.Low-Carbon Heating	29,168.82	£9,287.26	£318.40
	3.Renewable Energy	-361.42	£1,095.01	Not Effective
	Totals	52,064.14	£37,549.49	£721.22
Semi Detached	Base	0.00	£0.00	N/A
	Building Fabric	17,164.08	£19,069.32	£1,111.00
	Low-Carbon Heating	27,521.43	£4,921.08	£178.81
	Renewable Energy	-356.83	£1,121.02	Not Effective
	Totals	44,328.69	£25,111.42	£566.48
Mid Terrace House	Base	0.00	£0.00	N/A
	1.Building Fabric	38,441.17	£5,054.59	£131.49
	2.Low-Carbon Heating	28,468.29	£15,341.94	£538.91
	3.Renewable Energy	-356.34	£1,187.81	Not Effective

	Totals	66,553.12	£21,584.35	£324.32
End Terrace House	Base	0.00	£0.00	N/A
	1.Building Fabric	43,256.50	£13,007.00	£300.69
	2.Low-Carbon Heating	31,460.11	£14,435.27	£458.84
	3.Renewable Energy	-356.34	£1,107.44	Not Effective
	Totals	74,360.27	£28,549.71	£383.94
Mid Terrace Flat	Base	0.00	£0.00	N/A
	1.Building Fabric	22,584.95	£4,920.70	£217.88
	2.Low-Carbon Heating	25,914.69	£3,376.28	£130.28
	3.Renewable Energy	-357.80	£1,352.14	Not Effective
	Totals	48,141.85	£9,649.11	£200.43
End Terrace Flat	Base	0.00	£0.00	N/A
	1.Building Fabric	23,010.46	£7,221.37	£313.83
	2.Low-Carbon Heating	33,809.28	£3,524.82	£104.26
	3.Renewable Energy	-357.80	£1,304.87	Not Effective
	Totals	56,461.93	£12,051.06	£213.44

Typical Retrofit – Specific (Bungalow)

Within Table 64, the Carbon Cost Effectiveness for typical retrofit has been estimated, for the specific property type.

Table 64 - Carbon Cost Effectiveness of typical retrofit (specific property type)

Property Type	Retrofit Stage	**Net Lifetime Carbon Reduction ($kgCO_2e$)**	**Net Lifetime Cost (£)**	**Carbon Cost Effectiveness (£/tCO_2e)**
Bungalow (Specific)	Base	0.00	£0.00	N/A
	Building Fabric	9,960.82	£12,373.24	£1,242.19
	Low-Carbon Heating	21,065.02	£9,820.04	£466.18
	Renewable Energy	-1,330.20	-£4,104.23	Not Effective
	Totals	29,695.65	£18,089.05	£609.15

Deep Retrofit – Generic

Within Table 65, the Carbon Cost Effectiveness for deep retrofit has been estimated, for the generic property types.

Table 65 - Carbon Cost Effectiveness of deep retrofit (generic property types)

Property Type	**Retrofit Stage**	**Net Lifetime Carbon Reduction ($kgCO_2e$)**	**Net Lifetime Cost (£)**	**Carbon Cost Effectiveness (£/tCO_2e)**
Detached	Base	0.00	£0.00	N/A
	1.Building Fabric	29,715.63	£57,541.70	£1,936.41
	2.Low-Carbon Heating	19,584.37	£7,977.57	£407.34
	3.Renewable Energy	-361.42	£1,024.38	Not Effective
	Totals	48,938.57	£66,543.65	£1,359.74

Semi-Detached	Base Case	0.00	£0.00	N/A
	Building Fabric	23,470.45	£49,483.63	£2,108.34
	Low-Carbon Heating	17,374.12	£3,550.32	£204.35
	Renewable Energy	-361.26	£1,016.27	Not Effective
	Total	40,483.32	£54,050.21	£1,335.12
Mid Terrace House	Base	0.00	£0.00	N/A
	1.Building Fabric	43,830.19	£37,306.69	£851.16
	2.Low-Carbon Heating	19,731.23	£12,158.47	£616.20
	3.Renewable Energy	-356.34	£1,032.40	Not Effective
	Totals	63,205.09	£50,497.56	£798.95
End Terrace House	Base	0.00	£0.00	N/A
	1.Building Fabric	50,874.75	£44,562.25	£875.92
	2.Low-Carbon Heating	20,756.97	£12,153.35	£585.51
	3.Renewable Energy	-356.34	£1,005.07	Not Effective
	Totals	71,275.38	£57,720.67	£809.83
Mid Terrace Flat	Base	0.00	£0.00	N/A
	1.Building Fabric	28,117.78	£22,432.20	£797.79
	2.Low-Carbon Heating	18,622.21	£2,960.22	£158.96
	3.Renewable Energy	-357.80	£1,173.78	Not Effective
	Totals	46,382.19	£26,566.19	£572.77
End Terrace Flat	Base	0.00	£0.00	N/A
	1.Building Fabric	34,792.56	£26,011.88	£747.63
	2.Low-Carbon Heating	20,117.18	£2,885.01	£143.41
	3.Renewable Energy	-357.80	£1,132.92	Not Effective
	Totals	54,551.94	£30,029.82	£550.48

Deep Retrofit – Specific (Bungalow)

Within Table 66, the Carbon Cost Effectiveness for typical retrofit has been estimated, for the specific property type.

Table 66 - Carbon Cost Effectiveness of deep retrofit (specific property type)

Property Type	**Retrofit Stage**	**Net Lifetime Carbon Reduction ($kgCO_2e$)**	**Net Lifetime Cost (£)**	**Carbon Cost Effectiveness (£/tCO_2e)**
Bungalow (Specific)	Base	0	£0	N/A
	Building Fabric	13,966	£31,484	£2,254.27
	Low-Carbon Heating	13,817	£9,426	£682.17
	Renewable Energy	-1,330	-£4,239	Not Effective
	Total	26,453	£36,671	£1,386.26

8.4 Summary

Typical Retrofit

Within Figure 46, a comparison of Carbon Cost Effectiveness is provided for the typical retrofit scenario.

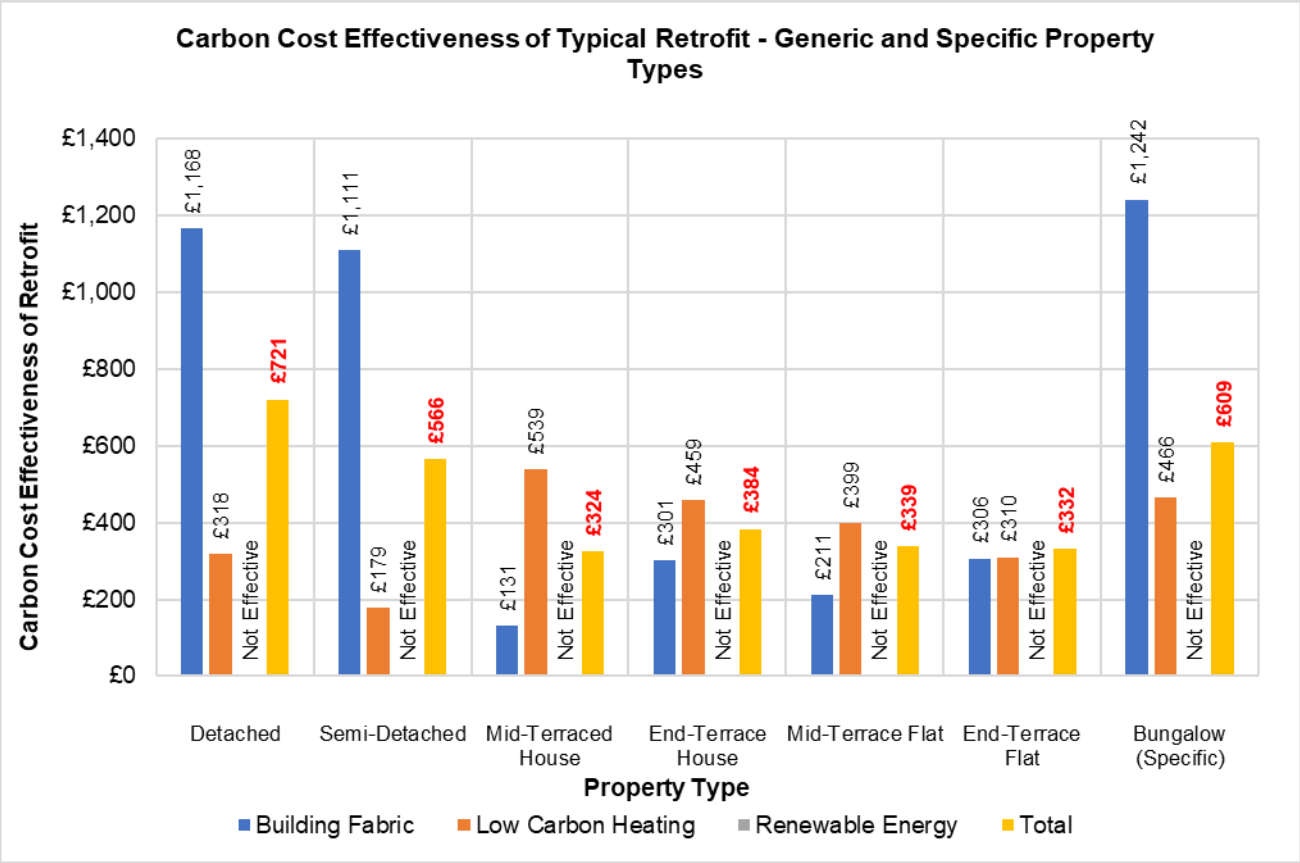


Figure 46 – Carbon Cost Effectiveness of typical retrofit, generic and specific property types

Discussion

- All property types, under both the typical and deep retrofit scenarios, result in a Net Lifetime Carbon Reduction. Therefore, it can be concluded that over a 20-year RSP, these measures are 'effective' at reducing Net Lifetime Carbon, when sequenced in accordance with the assumptions.
- In all property types, renewable energy installations result in neither a Net Lifetime Cost saving, or a Net Lifetime Carbon Saving. The Carbon Cost Effectiveness for renewables is therefore not effective for these property types.
- For all properties, building fabric upgrades result in a Net Lifetime Cost whilst also all seeing a Net Lifetime Carbon Reduction.
- For the detached and semi-detached properties, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £318/tCO_2e and £1179/tCO_2e respectively.
- For the mid-terraced house and end-terraced house, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £539/tCO_2e and £459/tCO_2e respectively. For the low carbon heating, this is the highest CCE of all of the generic property types.

- For the mid-terraced and end-terraced flats, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £399/tCO_2e and £310/tCO_2e respectively.
- For the bungalow, the low carbon heating upgrades result in a Carbon Cost Effectiveness of £466/tCO_2e.
- Considering total Carbon Cost Effectiveness, the detached and semi-detached properties, and the mid-terrace and end-terrace houses, result in a total CCE of between 721/tCO_2e and 566/tCO_2e, over the RSP.
- The mid-terrace and end-terrace flats result in a total CCE of between £339/tCO_2e. and -£332/tCO_2e, over the RSP.
- The bungalow results in a CCE of between 609/tCO_2e, over the RSP. This high CCE figure is driven by the increased quantity of solar applied to the bungalow, which hasn't begun to pay off effectively after just 20 years.

Deep Retrofit

Within Figure 47, a comparison of Carbon Cost Effectiveness is provided for the deep retrofit scenario.

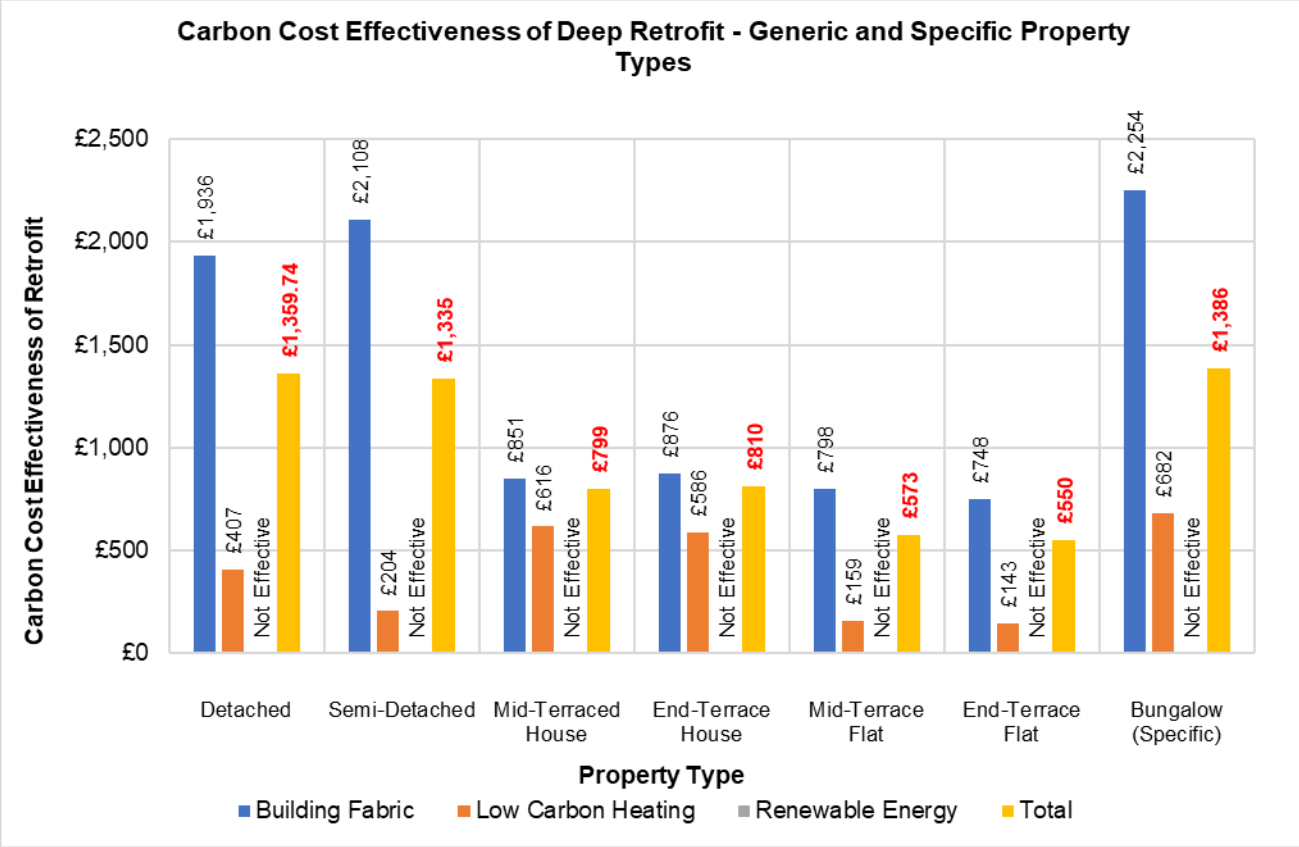


Figure 47 – Carbon Cost Effectiveness of deep retrofit, generic and specific property types

Discussion

- All property types, under both the typical and deep retrofit scenarios, result in a Net Lifetime Carbon Reduction. Therefore, it can be concluded that over a 20-year RSP, these measures are 'effective' at reducing Net Lifetime Carbon, when sequenced in accordance with the assumptions.
- In all property types, renewable energy installations result in neither a Net Lifetime Cost saving, or a Net Lifetime Carbon Saving. The Carbon Cost Effectiveness for renewables is therefore not effective for these property types.
- For the detached and semi-detached properties, the building fabric improvements result in a CCE rate of between £1,936/tCO_2e and £2,108/tCO_2e, which is the highest amongst the property types.
- For the flats, the building fabric upgrades result in a CCE rate of between £748/tCO_2e and £798/tCO_2e, which is the lowest of all property types for this Retrofit Stage. This is driven by the low quantity of heat loss perimeter walls and the reduced quantity of ground floor insulation required, when applied as a ratio across both flats.
- For the bungalow, the building fabric upgrades result in a CCE rate of £2,254/tCO_2e.
- For the detached and semi-detached properties, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £407/tCO_2e and £204/tCO_2e respectively.
- For the mid-terraced house and end-terraced house, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £616/tCO_2e and £586/tCO_2e respectively.
- For the mid-terraced and end-terraced flats, the low carbon heating upgrades result in a Carbon Cost Effectiveness of between £159/tCO_2e and £143/tCO_2e respectively. For the low carbon heating, this is the lowest CCE of all property types, which is driven by the fact that the flats share a single ASHP.
- For the bungalow, the low carbon heating upgrades result in a Carbon Cost Effectiveness of £682/tCO_2e. For the low carbon heating, this is the highest CCE of all property types.
- Considering total Carbon Cost Effectiveness, the detached and semi-detached properties, and the mid-terrace and end-terrace houses, result in a total CCE of between 1359/tCO_2e and 799/tCO_2e, over the RSP.
- The mid-terrace and end-terrace flats result in a total CCE of between £573/tCO_2e. and £550/tCO_2e respectively, over the RSP.
- The bungalow results in a CCE of between £1,386/tCO_2e, over the RSP.

9 Broxtowe Housing: Decarbonisation Roadmap

Within this Section, the key data outputs from this technical report are summarised, to provide strategic guidance for Broxtowe Borough Council.

9.1 House Type Analysis

Within this sub-section, the key outputs and results are summarised per house type.

Detached House

General

- Floor area: 89.9
- Bedrooms: 2
- Occupancy: 3
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
    - 57.6m^2 of Rockwool loft insulation at 400mm thickness
    - 159m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
    - Mitsubishi Ecodan 5kW + 200L Packaged Cylinder
    - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
    - 57.6m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
    - 9.3m^2 of triple glazed PVC window area (openable)
    - 5.7m^2 of solid UPVC external door area
- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £55,800
    - Building Fabric: £35,633
    - Low-Carbon Hating: £12,200
    - Renewable Energy: £7,968
- Annual Energy Savings: £913
- Payback Period: 61 years
- Lifetime Financial Savings: £18,251
- Net Lifetime Cost: £37,549
- Embodied Carbon Emissions (20-Year): 8.7tCO_2e
- Operational Carbon Emissions (20-Year): 2.6tCO_2e
- Whole Life Carbon Emissions (20-Year): 11.3tCO_2e
- Operational Carbon Savings: 60.7tCO_2e
- Net Lifetime Carbon Reduction: 52.0tCO_2e
- Carbon Cost Effectiveness: £721 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £88,969
    - Building Fabric: £68,980
    - Low-Carbon Hating: £12,091
    - Renewable Energy: £7,898
- Annual Energy Savings: £1,121
- Payback Period: 79 years
- Lifetime Financial Savings: £22,426

- Net Lifetime Cost: £66,544
- Embodied Carbon Emissions (20-Year): 12.4tCO_2e
- Operational Carbon Emissions (20-Year): 2tCO_2e
- Whole Life Carbon Emissions: 14.5tCO_2e
- Operational Carbon Savings: 61.3tCO_2e
- Net Lifetime Carbon Reduction: 48.9tCO_2e
- Carbon Cost Effectiveness: £1,359 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £55,800 compared to £88,969 for Deep Retrofit. The increase of £33,169 or 59% represents the additional cost of implementing enhanced measures such as new floor insulation, new windows and doors, and improved air tightness.
- A Typical Retrofit results in annual energy savings of £913, compared to £1,121 for Deep Retrofit.
- Deep Retrofit costs £33,169 more than Typical Retrofit for increased annual savings of £208. This equates to a payback period of 159 years for the additional capital investment.
    - Retrofit Stage 1 (Building Fabric) represents 64% of the total cost for Typical Retrofit (at £35,633) and increases to 78% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 22% of the total Capital Cost for Typical Retrofit (at £12,200) and 14% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents 14% of the total Capital Cost for Typical Retrofit (at £7,968) and 9% for Deep Retrofit.
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
    - Typical Retrofit would result in a payback period of 61 years for Stage 1 (Building Fabric), 61 years for Stage 2 (Low-Carbon Heating), and 17 years for Stage 3 (Renewable Energy). Combined, this gives a financial payback of 61 years.
    - Deep Retrofit would result in a payback period of 96 years for Stage 1 (Building Fabric), 47 years for Stage 2 (Low-Carbon Heating), and 18 years for Stage 3 (Renewable Energy). Combined, this yields a financial payback of 79 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 8.7tCO_2e compared to 12.4tCO_2e for Deep Retrofit. The increase of 3.7tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 2.6tCO_2e compared to 2.0tCO_2e for Deep Retrofit. The additional saving of 0.6tCO_2e for Deep Retrofit is attributed to these enhanced measures.
- For this property type, Deep Retrofit results in 3.7tCO_2e more embodied carbon emissions than Typical Retrofit, but only achieves operational carbon savings of 0.6tCO_2e. Therefore, shifting from Typical to Deep Retrofit results in a net increase in Whole Life Carbon of approximately 3.2tCO_2e.
- Over 20 years, a Typical Retrofit achieves a Net Whole Life Carbon Reduction of 52,100kgCO_2e compared to 48,900kgCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:
    - Retrofit Stage 1 (Building Fabric) represents 45% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 61% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 56% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 40% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.
- For this house type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.

- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; the cost per tonne of carbon saved is £721/tCO_2e for Typical Retrofit compared to £1,359/tCO_2e for Deep Retrofit.

Semi-Detached House

General

- Floor area: 89.7
- Bedrooms: 2
- Occupancy: 3
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
    - 48.7m^2 of Rockwool loft insulation at 400mm thickness
    - 112m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
    - Mitsubishi Ecodan 5kW + 200L Packaged Cylinder
    - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
    - 48.7m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
    - 9.3m^2 of triple glazed PVC window area (openable)
    - 5.7m^2 of solid UPVC external door area
- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £45,810
    - Building Fabric: £25,494
    - Low-Carbon Hating: £12,289
    - Renewable Energy: £8,027
- Annual Energy Savings: £1,035
- Payback Period: 44 years
- Lifetime Financial Savings: £20,698
- Net Lifetime Cost: £25,111
- Embodied Carbon Emissions (20-Year): 7.8tCO_2e
- Operational Carbon Emissions (20-Year): 2.5tCO_2e
- Whole Life Carbon: 10.3tCO_2e
- Operational Carbon Savings: 52.1tCO_2e
- Net Lifetime Carbon Reduction: 44.3tCO_2e
- Carbon Cost Effectiveness: £566 per tonne of CO_2e saved

Deep retrofit

- Upfront Capital Cost: £78,979
    - Building Fabric: £58,928
    - Low-Carbon Hating: £12,128
    - Renewable Energy: £7,922
- Annual Energy Savings: £1,246
- Payback Period: 63 years
- Lifetime Financial Savings: £24,928
- Net Lifetime Cost: £54,050
- Embodied Carbon Emissions (20-Year): 12.3tCO_2e
- Operational Carbon Emissions (20-Year): 1.9tCO_2e
- Whole Life Carbon: 14.2tCO_2e
- Operational Carbon Savings: 52.7tCO_2e
- Net Lifetime Carbon Reduction: 40.4tCO_2e
- Carbon Cost Effectiveness: £1,335 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £45,810 compared to £78,979 for Deep Retrofit. The increase of £33,169 or 72% represents the additional cost of implementing new floor insulation, new windows and doors, and improved air tightness measures.
- A Typical Retrofit results in annual energy savings of £1,035, compared to £1,246 for Deep Retrofit.
- Deep Retrofit costs £33,169 more than Typical Retrofit for increased annual savings of £211. This equates to a payback period of 157 years for the increased capital investment.
    - Retrofit Stage 1 (Building Fabric) represents 56% of the total cost, at £25,494. This increases to 75% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 27% of the total Capital Cost for Typical Retrofit and 15% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents 18% of the total Capital Cost for Typical Retrofit and 10% for Deep Retrofit.
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
    - Typical Retrofit would result in a payback period of 61 years for Stage 1 (Building Fabric), 61 years for Stage 2 (Low-Carbon Heating), and 17 years for Stage 3 (Renewable Energy). Combined financial payback 44 years.
    - Deep Retrofit would result in a payback period of 96 years for Stage 1 (Building Fabric), 47 years for Stage 2 (Low-Carbon Heating), and 18 years for Stage 3 (Renewable Energy). Combined financial payback 63 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 7.8tCO_2e compared to 12.3tCO_2e for Deep Retrofit. The increase of 4.5tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 2.5tCO_2e compared to 1.9tCO_2e for Deep Retrofit. The increased saving of 0.6tCO_2e for Deep Retrofit is associated with the enhanced building fabric measures.
- For this property type, Deep Retrofit results in 4.5tCO_2e more embodied carbon emissions than the Typical Retrofit, but only results in operational carbon savings of 0.6tCO_2e. Therefore, improving the retrofit strategy from Typical to Deep results in a net increase in Whole Life Carbon of 3.9tCO_2e.
- Over 20 years, a Typical Retrofit achieves a Net Whole Life Carbon Reduction of 44,300kgCO_2e compared to 40,400kgCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:

- Retrofit Stage 1 (Building Fabric) represents 47% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 58% for Deep Retrofit.
- Retrofit Stage 2 (Low-Carbon Heating) represents 51% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 43% for Deep Retrofit.
- Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.

- For this house type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective, in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure, in terms of Net Lifetime Carbon Reduction. This is driven by the shift to electricity from gas.
- It can be concluded that solar is not effective in reducing Whole Life Carbon. This is because the upfront embodied carbon is higher than the operational carbon savings, over a 20-year period.
- From a Whole Life Carbon Reduction perspective, it can be concluded that Typical Retrofit is more effective than Deep Retrofit for this property type.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and results in more Whole Life Carbon Savings than Deep Retrofit. Therefore, the cost per tonne of carbon saved for Typical Retrofit is lower, at £566/tCO_2e compared to £1,335/tCO_2e for Deep Retrofit.

Mid-Terrace House

General

- Floor area: 8*9.7*
- Bedrooms: 3
- Occupancy: 4
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
  - 50.3m^2 of Rockwool loft insulation at 400mm thickness
  - 72.9m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
  - Mitsubishi Ecodan 5kW + 200L Packaged Cylinder
  - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
  - 50.3m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
  - 10.7m^2 of triple glazed PVC window area (openable)
  - 5.7m^2 of solid UPVC external door area
- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £37,795
  - Building Fabric: £17,302
  - Low-Carbon Hating: £12,396

- Renewable Energy: £8,097
- Annual Energy Savings: £811
- Payback Period: 47 years
- Lifetime Financial Savings: £16,211
- Net Lifetime Cost: £21,584
- Embodied Carbon Emissions (20-Year): 6.5tCO_2e
- Operational Carbon Emissions (20-Year): 3.5tCO_2e
- Whole Life Carbon: 10.0tCOe
- Operational Carbon Savings: 73.1tCO_2e
- Net Lifetime Carbon Reduction: 66.6tCO_2e
- Carbon Cost Effectiveness: £324 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £72,445
  - Building Fabric: £52,345
  - Low-Carbon Hating: £12,158
  - Renewable Energy: £7,922
- Annual Energy Savings: £1,097
- Payback Period: 66 years
- Lifetime Financial Savings: £21,947
- Net Lifetime Cost: £50,498
- Embodied Carbon Emissions (20-Year): 10.7tCO_2e
- Operational Carbon Emissions (20-Year): 2.7tCO_2e
- Whole Life Carbon: 13.4tCO_2 e
- Operational Carbon Savings: 73.9tCO_2e
- Net Lifetime Carbon Reduction: 63.2tCO_2e
- Carbon Cost Effectiveness: £798 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £37,795 compared to £72,445 for Deep Retrofit. The increase of £34,650 (approximately 92%) represents the additional cost of implementing enhanced measures such as improved building fabric.
- A Typical Retrofit results in annual energy savings of £811, compared to £1,097 for Deep Retrofit.
- Deep Retrofit costs £34,650 more than Typical Retrofit for increased annual savings of £286. This equates to a payback period of approximately 121 years for the additional capital investment.
  - Retrofit Stage 1 (Building Fabric) represents 46% of the total cost for Typical Retrofit (at £17,302) and increases to 72% for Deep Retrofit (at £52,345).
  - Retrofit Stage 2 (Low-Carbon Heating) represents 33% of the total Capital Cost for Typical Retrofit (at £12,396) and 17% for Deep Retrofit (at £12,158).
  - Retrofit Stage 3 (Renewable Energy) represents 21% of the total Capital Cost for Typical Retrofit (at £8,097) and 11% for Deep Retrofit (at £7,922).
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
  - Typical Retrofit would result in a payback period of approximately 55 years for Stage 1 (Building Fabric), 55 years for Stage 2 (Low-Carbon Heating), and 15 years for Stage 3 (Renewable Energy), yielding a combined financial payback of 47 years.
  - Deep Retrofit would result in a payback period of approximately 80 years for Stage 1, 45 years for Stage 2, and 18 years for Stage 3, yielding a combined financial payback of 66 years.

- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 6.5tCO_2e compared to 10.7tCO_2e for Deep Retrofit. The increase of 4.2tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 3.5tCO_2e compared to 2.7tCO_2e for Deep Retrofit. The additional saving of 0.8tCO_2e for Deep Retrofit is attributed to these measures.
- For this property type, Deep Retrofit results in 4.2tCO_2e more embodied carbon emissions than Typical Retrofit, but only achieves operational carbon savings of 0.8tCO_2e. Therefore, shifting from Typical to Deep Retrofit results in a net decrease in Whole Life Carbon Reduction of approximately 3.4tCO_2e.
- Over 20 years, a Typical Retrofit achieves a Net Whole Life Carbon Reduction of 66,600kgCO_2e compared to 63,200kgCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:
    - Retrofit Stage 1 (Building Fabric) represents 58% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 69% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 43% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 31% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.
- For this house type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; therefore, the cost per tonne of carbon saved for Typical Retrofit is £324/tCO_2e compared to £798/tCO_2e for Deep Retrofit.

End-Terrace House

General

- Floor area: 89.7
- Bedrooms: 3
- Occupancy: 4
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
    - 50.3m^2 of Rockwool loft insulation at 400mm thickness
    - 118.5m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
    - Mitsubishi Ecodan 5kW + 200L Packaged Cylinder
    - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
    - 50.3m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
    - 10.7m^2 of triple glazed PVC window area (openable)
    - 5.7m^2 of solid UPVC external door area

- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £47,273
    - Building Fabric: £26,983
    - Low-Carbon Hating: £12,273
    - Renewable Energy: £8,016
- Annual Energy Savings: £936
- Payback Period: 30 years
- Lifetime Financial Savings: £18,723
- Net Lifetime Cost: £28,550
- Embodied Carbon Emissions (20-Year): 7.6tCO_2e
- Operational Carbon Emissions (20-Year): 3.6tCO_2e
- Whole Life Carbon: 11.2tCO_2e
- Operational Carbon Savings: 82.0tCO_2e
- Net Lifetime Carbon Reduction: 74.4tCO_2e
- Carbon Cost Effectiveness: £383 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £81,923
    - Building Fabric: £61,892
    - Low-Carbon Hating: £12,117
    - Renewable Energy: £7,914
- Annual Energy Savings: £1,210
- Payback Period: 67 years
- Lifetime Financial Savings: £24,202
- Net Lifetime Cost: £57,721
- Embodied Carbon Emissions (20-Year): 11.5tCO_2e
- Operational Carbon Emissions (20-Year): 2.8tCO_2e
- Whole Life Carbon: 14.3tCO_2e
- Operational Carbon Savings: 82.8tCO_2e
- Net Lifetime Carbon Reduction: 71.3tCO_2e
- Carbon Cost Effectiveness: £809 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £47,273 compared to £81,923 for Deep Retrofit. The increase of £34,650 (approximately 73%) represents the additional cost of implementing enhanced measures such as improved building fabric.
- A Typical Retrofit results in annual energy savings of £936, compared to £1,210 for Deep Retrofit.
- Deep Retrofit costs £34,650 more than Typical Retrofit for increased annual savings of £274. This equates to a payback period of approximately 126 years for the additional capital investment.
    - Retrofit Stage 1 (Building Fabric) represents 57% of the total cost for Typical Retrofit (at £26,983) and increases to 76% for Deep Retrofit (at £61,892).

    - Retrofit Stage 2 (Low-Carbon Heating) represents 26% of the total Capital Cost for Typical Retrofit (at £12,273) and 15% for Deep Retrofit (at £12,117).
    - Retrofit Stage 3 (Renewable Energy) represents 17% of the total Capital Cost for Typical Retrofit (at £8,016) and 10% for Deep Retrofit (at £7,914).
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
    - Typical Retrofit would result in a payback period of approximately 40 years for Stage 1 (Building Fabric), 40 years for Stage 2 (Low-Carbon Heating), and 15 years for Stage 3 (Renewable Energy), yielding a combined financial payback of 30 years.
    - Deep Retrofit would result in a payback period of approximately 70 years for Stage 1 (Building Fabric), 45 years for Stage 2 (Low-Carbon Heating), and 18 years for Stage 3 (Renewable Energy), yielding a combined financial payback of 67 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 7.6tCO_2e compared to 11.5tCO_2 e for Deep Retrofit. The increase of 3.9tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 3.6tCO_2e compared to 2.8tCO_2e for Deep Retrofit. The additional saving of 0.8tCO_2e for Deep Retrofit is attributed to these measures.
- For this property type, Deep Retrofit results in 3.9tCO_2e more embodied carbon emissions than Typical Retrofit, but only achieves additional operational carbon savings of 0.8tCO_2e. Therefore, shifting from Typical to Deep Retrofit results in a net decrease in Whole Life Carbon Reduction of approximately 3.1tCO_2e.
- Over 20 years, a Typical Retrofit achieves a Net Whole Life Carbon Reduction of 74,400kgCO_2e compared to 71,300kgCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:
    - Retrofit Stage 1 (Building Fabric) represents 58% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 71% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 42% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 29% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.
- For this house type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; therefore, the cost per tonne of carbon saved for Typical Retrofit is £383/tCO_2e compared to £809/tCO_2e for Deep Retrofit.

Mid Terrace Flat

General

- Floor area: 50.9
- Bedrooms: 2

- Occupancy: 3
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
    - 50.9m^2 of Rockwool loft insulation at 400mm thickness
    - 51.7m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
    - Mitsubishi Ecodan 8kW + 150L Packaged Cylinder (Shared between flats)
    - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
    - 50.3m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
    - 7.3m^2 of triple glazed PVC window area (openable)
    - 1.8m^2 of solid UPVC external door area
- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £27,521
    - Building Fabric: £11,951
    - Low-Carbon Hating: £7,156
    - Renewable Energy: £8,139
- Annual Energy Savings: £894
- Payback Period: 31 years
- Lifetime Financial Savings: £17,872
- Net Lifetime Cost: £9,649
- Embodied Carbon Emissions (20-Year): 4.2tCO_2e
- Operational Carbon Emissions (20-Year): 1.8tCO_2e
- Whole Life Carbon: 6.0tCO_2e
- Operational Carbon Savings: 52.3tCO_2e
- Net Lifetime Carbon Reduction: 48.1tCO_2e
- Carbon Cost Effectiveness: £200 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £46,922
    - Building Fabric: £31,848
    - Low-Carbon Hating: £7,001
    - Renewable Energy: £8,072
- Annual Energy Savings: £1,018
- Payback Period: 46 years
- Lifetime Financial Savings: £20,356
- Net Lifetime Cost: £26,566
- Embodied Carbon Emissions (20-Year): 6.3tCO_2e
- Operational Carbon Emissions (20-Year): 1.5tCO_2e
- Whole Life Carbon: 7.8tCO_2e
- Operational Carbon Savings: 52.6tCO_2e
- Net Lifetime Carbon Reduction: 46.3tCO_2e

- Carbon Cost Effectiveness: £573 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £27,521 compared to £46,922 for Deep Retrofit. The increase of £19,401 (approximately 70%) represents the additional cost of implementing enhanced measures such as improved building fabric, optimized low-carbon heating, and upgraded renewable energy systems.
- A Typical Retrofit results in annual energy savings of £894, compared to £1,018 for Deep Retrofit.
- Deep Retrofit costs £19,401 more than Typical Retrofit for increased annual savings of £124. This equates to a payback period of approximately 157 years for the additional capital investment.
    - Retrofit Stage 1 (Building Fabric) represents 43% of the total cost for Typical Retrofit (at £11,951) and increases to 68% for Deep Retrofit (at £31,848).
    - Retrofit Stage 2 (Low-Carbon Heating) represents 26% of the total Capital Cost for Typical Retrofit (at £7,156) and 15% for Deep Retrofit (at £7,001).
    - Retrofit Stage 3 (Renewable Energy) represents 30% of the total Capital Cost for Typical Retrofit (at £8,139) and 17% for Deep Retrofit (at £8,072).
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
    - Typical Retrofit would result in a payback period of approximately 35 years for Stage 1 (Building Fabric), 35 years for Stage 2 (Low-Carbon Heating), and 12 years for Stage 3 (Renewable Energy). Combined, this yields a financial payback of 31 years.
    - Deep Retrofit would result in a payback period of approximately 55 years for Stage 1 (Building Fabric), 40 years for Stage 2 (Low-Carbon Heating), and 15 years for Stage 3 (Renewable Energy). Combined, this yields a financial payback of 46 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are $4.2tCO_2e$ compared to $6.3tCO_2e$ for Deep Retrofit. The increase of $2.1tCO_2e$ is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is $1.8tCO_2e$ compared to $1.5tCO_2e$ for Deep Retrofit. The additional saving of $0.3tCO_2e$ for Deep Retrofit is attributed to these measures.
- For this property type, Deep Retrofit results in $2.1tCO_2e$ more embodied carbon emissions than Typical Retrofit, but only achieves operational carbon savings of $0.3tCO_2e$. Therefore, shifting from Typical to Deep Retrofit results in a net decrease in Whole Life Carbon Reduction of approximately $1.8tCO_2e$.
- Over 20 years, a Typical Retrofit achieves a Net Lifetime Carbon Reduction of $48,100kgCO_2e$ compared to $46,300kgCO_2e$ for Deep Retrofit. Considering the breakdown per Retrofit Stage:
    - Retrofit Stage 1 (Building Fabric) represents 47% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 61% for Deep Retrofit.
    - Retrofit Stage 2 (Low-Carbon Heating) represents 54% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 40% for Deep Retrofit.
    - Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.
- For this property type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.

- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; therefore, the cost per tonne of carbon saved for Typical Retrofit is £200/tCO_2e compared to £573/tCO_2e for Deep Retrofit.

End Terrace Flat

General

- Floor area: 62.0
- Bedrooms: 2
- Occupancy:3
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
    - 62.0m^2 of Rockwool loft insulation at 400mm thickness
    - 63.0m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
    - Mitsubishi Ecodan 8kW + 150L Packaged Cylinder (Shared between flats)
    - 5 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
    - 62.0m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
    - 8.1m^2 of triple glazed PVC window area (openable)
    - 1.8m^2 of solid UPVC external door area
- Excluding the flats, the assumed quantity of Low Carbon Heating and PV remains consistent across all generic property types. The only varying factors being the material quantities for fabric improvements. As a result, in this analysis, the house type geometry is the primary factor influencing cost and carbon outcomes.

Typical Retrofit

- Upfront Capital Cost: £29,990
    - Building Fabric: £14,503
    - Low-Carbon Hating: £7,115
    - Renewable Energy: £8,109
- Annual Energy Savings: £897
- Payback Period: 33 years
- Lifetime Financial Savings: £17,939
- Net Lifetime Cost: £12,051
- Embodied Carbon Emissions (20-Year): 4.8tCO_2e
- Operational Carbon Emissions (20-Year): 2.3tCO_2e
- Whole Life Carbon: 7.1tCO_2e
- Operational Carbon Savings: 61.2tCO_2e
- Net Lifetime Carbon Reduction: 56.5tCO_2e
- Carbon Cost Effectiveness: £213 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £52,637
    - Building Fabric: £37,640

- Low-Carbon Hating: £6,966
- Renewable Energy: £8,032

- Annual Energy Savings: £1,130
- Payback Period: 47 years
- Lifetime Financial Savings: £22,607
- Net Lifetime Cost: £30,030
- Embodied Carbon Emissions (20-Year): 7.3tCO_2e
- Operational Carbon Emissions (20-Year): 1.6tCO_2e
- Whole Life Carbon: 8.9tCO_2e
- Operational Carbon Savings: 61.9tCO_2e
- Net Lifetime Carbon Reduction: 54.6tCO_2e
- Carbon Cost Effectiveness: £550 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £29,990 compared to £52,637 for Deep Retrofit. The increase of £22,647 or approximately 76% represents the additional cost of implementing enhanced measures such as improved building fabric, optimized low-carbon heating, and upgraded renewable energy systems.
- A Typical Retrofit results in annual energy savings of £897, compared to £1,130 for Deep Retrofit.
- Deep Retrofit costs £22,647 more than Typical Retrofit for increased annual savings of £233. This equates to a payback period of approximately 97 years for the additional capital investment.
    - Retrofit Stage 1 (Building Fabric) represents 48% of the total cost for Typical Retrofit (at £14,503) and increases to 72% for Deep Retrofit (at £37,640).
    - Retrofit Stage 2 (Low-Carbon Heating) represents 24% of the total Capital Cost for Typical Retrofit (at £7,115) and 13% for Deep Retrofit (at £6,966).
    - Retrofit Stage 3 (Renewable Energy) represents 27% of the total Capital Cost for Typical Retrofit (at £8,109) and 15% for Deep Retrofit (at £8,109)—noting a slight rounding adjustment for consistency.
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
    - Typical Retrofit would result in a payback period of approximately 46 years for Stage 1 (Building Fabric), 46 years for Stage 2 (Low-Carbon Heating), and 13 years for Stage 3 (Renewable Energy), yielding a combined financial payback of 33 years.
    - Deep Retrofit would result in a payback period of approximately 72 years for Stage 1, 35 years for Stage 2, and 14 years for Stage 3, yielding a combined financial payback of 47 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 4.8tCO_2e compared to 7.3tCO e for Deep Retrofit. The increase of 2.5tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 2.3tCO_2e compared to 1.6tCO_2e for Deep Retrofit. The increased saving of 0.7tCO_2e for Deep Retrofit is attributed to these measures.
- For this property type, Deep Retrofit results in 2.5tCO_2e more embodied carbon emissions than Typical Retrofit, but only achieves operational carbon savings of 0.7tCO_2e. Therefore, improving the retrofit strategy from Typical to Deep results in a net decrease in Whole Life Carbon Reduction of approximately 1.8tCO_2e.
- Over 20 years, a Typical Retrofit achieves a Net Lifetime Carbon Reduction of 56.5tCO_2e compared to 54.6tCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:
    - Retrofit Stage 1 (Building Fabric) represents 41% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 64% for Deep Retrofit.

- Retrofit Stage 2 (Low-Carbon Heating) represents 60% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to 37% for Deep Retrofit.
- Retrofit Stage 3 (Renewable Energy) represents –1% of the Net Lifetime Carbon Savings for both the Typical and Deep Retrofit scenarios.

- For this property type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; therefore, the cost per tonne of carbon saved for Typical Retrofit is £213/tCO_2e compared to £550/tCO_2e for Deep Retrofit.

Bungalow (Specific)

General

- Floor area: 53.0
- Bedrooms: 3
- Occupancy:4
- For the detached house the following material quantities were assumed for the typical retrofit scenario:
  - 57.8m^2 of Rockwool loft insulation at 400mm thickness
  - 86.7m^2 of external wall insulation, consisting of Rockwool insulation at 230mm thickness, adhesive basecoat, fibreglass mesh, and silicone render
  - Mitsubishi Ecodan 5kW + 200L Packaged Cylinder
  - 14 Jinko Tiger Neo 440Wp Solar Panels
- For the detached house the following additional material quantities were assumed for the deep retrofit scenario:
  - 53.5m^2 of Spacetherm Aerogel ground floor insulation at 40mm thickness and 3mm chipboard flooring
  - 8.7m^2 of triple glazed PVC window area (openable)
  - 3.6m^2 of solid UPVC external door area

Typical Retrofit

- Upfront Capital Cost: £42,868
  - Building Fabric: £16,354
  - Low-Carbon Hating: £12,323
  - Renewable Energy: £14,190
- Annual Energy Savings: £1,239
- Payback Period: 35 years
- Lifetime Financial Savings: £24,779
- Net Lifetime Cost: £18,083
- Embodied Carbon Emissions (20-Year): 9.2tCO_2e
- Operational Carbon Emissions (20-Year): 0.4tCO_2e
- Whole Life Carbon: 9.7tCO_2e
- Operational Carbon Savings: 29.7tCO_2e
- Net Lifetime Carbon Reduction: 21.0tCO_2e

- e Carbon Cost Effectiveness: £609 per tonne of CO_2e saved

Deep Retrofit

- Upfront Capital Cost: £63,967
  - Building Fabric: £37,705
  - Low-Carbon Hating: £12,207
  - Renewable Energy: £14,056
- Annual Energy Savings: £1,365
- Payback Period: 47 years
- Lifetime Financial Savings: £27,297
- Net Lifetime Cost: £36,671
- Embodied Carbon Emissions (20-Year): 12.9tCO_2e
- Operational Carbon Emissions (20-Year): 0.1tCO_2e
- Whole Life Carbon: 13.0tCO_2e
- Operational Carbon Savings: 39.3tCO_2e
- Net Lifetime Carbon Reduction: 26.5tCO_2e
- Carbon Cost Effectiveness: £1386 per tonne of CO_2e saved

Discussion

- A Typical Retrofit has a Lifetime Capital Cost of £42,868 compared to £63,967 for Deep Retrofit. The increase of £21,099 or approximately 49% represents the additional cost of implementing enhanced measures such as improved building fabric, optimized low-carbon heating, and upgraded renewable energy systems.
- A Typical Retrofit results in annual energy savings of £1,239, compared to £1,365 for Deep Retrofit.
- Deep Retrofit costs £21,099 more than Typical Retrofit for increased annual savings of £126. This equates to a payback period of approximately 167 years for the additional capital investment.
  - Retrofit Stage 1 (Building Fabric) represents 38% of the total cost for Typical Retrofit (at £16,354) and increases to 59% for Deep Retrofit (at £37,705).
  - Retrofit Stage 2 (Low-Carbon Heating) represents 29% of the total Capital Cost for Typical Retrofit (at £12,323) and 19% for Deep Retrofit (at £12,207).
  - Retrofit Stage 3 (Renewable Energy) represents 33% of the total Capital Cost for Typical Retrofit (at £14,190) and 22% for Deep Retrofit (at £14,056).
- Considering payback periods at each Retrofit Stage, based on the energy bill savings:
  - Typical Retrofit would result in a payback period of approximately 48 years for Stage 1 (Building Fabric), 48 years for Stage 2 (Low-Carbon Heating), and 15 years for Stage 3 (Renewable Energy), yielding a combined financial payback of 35 years.
  - Deep Retrofit would result in a payback period of approximately 70 years for Stage 1, 40 years for Stage 2, and 16 years for Stage 3, yielding a combined financial payback of 47 years.
- For Typical Retrofit, the Embodied Carbon emissions over 20 years are 9.2tCO_2e compared to 12.9tCO_2e for Deep Retrofit. The increase of 3.7tCO_2e is associated with the enhanced building fabric measures.
- The Operational Carbon associated with Typical Retrofit is 0.4tCO_2e compared to 0.1tCO_2e for Deep Retrofit. The additional saving of 0.3tCO_2e for Deep Retrofit is attributed to these measures.
- For this property type, Deep Retrofit results in 3.7tCO_2e more embodied carbon emissions than Typical Retrofit, but achieves operational carbon savings that are 0.3tCO_2e greater.

Therefore, improving the retrofit strategy from Typical to Deep results in a net increase in Whole Life Carbon Reduction of approximately 5.5tCO_2e.

- Over 20 years, a Typical Retrofit achieves a Net Lifetime Carbon Reduction of 29.7tCO_2e compared to 26.5tCO_2e for Deep Retrofit. Considering the breakdown per Retrofit Stage:
  - Retrofit Stage 1 (Building Fabric) represents 34% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to – for Deep Retrofit.
  - Retrofit Stage 2 (Low-Carbon Heating) represents 71% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to – for Deep Retrofit.
  - Retrofit Stage 3 (Renewable Energy) represents –4% of the Net Lifetime Carbon Savings for Typical Retrofit, compared to – for Deep Retrofit.
- For this property type, it can be concluded that the increased building fabric measures between Typical and Deep Retrofit are not cost-effective in terms of financial payback.
- It can be concluded that Low-Carbon Heating is the single most impactful measure in terms of Net Lifetime Carbon Reduction, driven by the shift from gas to electricity.
- It can be concluded that solar is not effective in reducing Whole Life Carbon, as the upfront embodied carbon is higher than the operational carbon savings over a 20-year period.
- Considering Carbon Cost Effectiveness, Typical Retrofit costs less and achieves more Whole Life Carbon Savings than Deep Retrofit; therefore, the cost per tonne of carbon saved for Typical Retrofit is £213/tCO_2e compared to £550/tCO_2e for Deep Retrofit.

9.2 Energy Bills

As highlighted throughout this report, the cost of energy increases significantly following ASHP installation, unless Fabric First principles are followed. To demonstrate this, Figure 48 and Figure 49 show the impact of electric heating on annual energy bills.

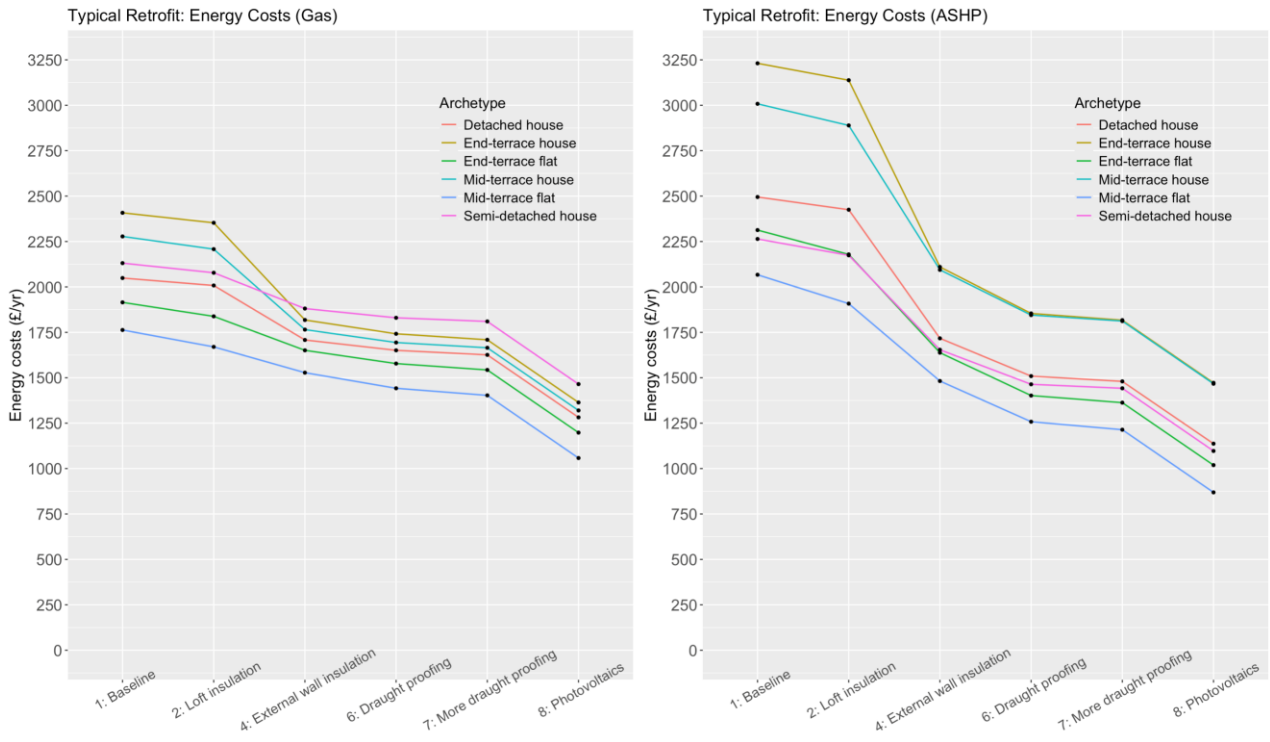


Figure 48 - Comparison of annual energy costs for deep retrofit, between gas (left) and ASHP heating (right)

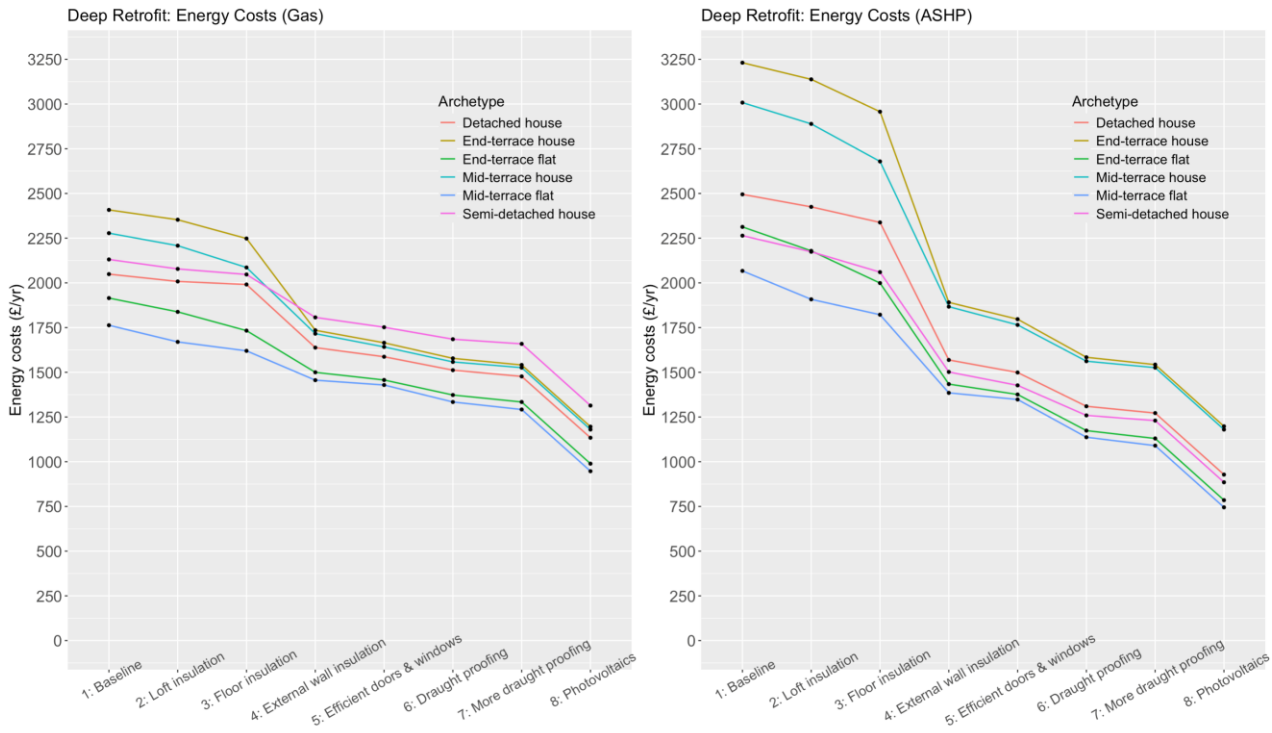


Figure 49 - Comparison of annual energy costs for deep retrofit, between gas (left) and ASHP heating (right)

Across all property types, energy bills increase by between 17%-34% per year, if an ASHP is installed with no fabric improvements. The equates to an increase of between £305 and £824 per year or between £6k and £16k over a 20-year period, depending on the house type.

Table 67 considers the annual reduction in energy bills, following the installation of loft insulation and EWI, with an electric heating system.

Table 67: Analysis of annual energy bills before and after loft and EWI optimisation, with ASHP heating

Annual Energy Cost Analysis			
House Type	Pre-Retrofit (Base) – Gas	Optimised (Loft & EWI) – Electricity	Reduction (%)
Detached	£2,050	£1,717	16%
Semi-Detached	£2,132	£1,655	22%
Mid-Terrace	£2,278	£2,094	8%
End-Terrace	£2,408	£2,111	12%
Mid-Terrace Flat	£1,763	£1,483	16%
End-Terrace Flat	£1,916	£1,639	14%

Table 67 shows that, for every house type, the annual energy bills consistently fall by between 8% and 22% compared to the pre-retrofit scenario. It is vital that Broxtowe Borough Council do not recommend or implement retrofit strategies that will result in increased energy bills for the occupiers. This would worsen household financial pressures and would adversely impact fuel poverty levels within the Borough.

9.3 Recommendations

Unless otherwise stated, the statements within this Section are true for both Generic and Specific house types.

- A Fabric First approach is recommended, for reasons set out at Sections 1.4, 1.5, 1.6, and 9.2. A primary driver for this is to ensure that energy bills for occupiers do not increase, as a result of heating electrification.
- To avoid unintended consequences, it is recommended that Broxtowe Borough Council (BBC) follow PAS 2035 best practice principles for retrofit. This includes the specification of External Wall Insulation, for reasons set out at Section 1.6.
- It can be concluded that increasing the fabric measures from Typical to Deep Retrofit is not cost-effective, in terms of financial payback.
- From a Whole Life Carbon Reduction perspective, it can be concluded that Typical Retrofit is more effective than Deep Retrofit.
- Considering Carbon Cost Effectiveness, Typical Retrofit consistently costs less and results in more Whole Life Carbon Savings than Deep Retrofit.
- It can be concluded that External Wall Insulation is the single most impactful fabric improvement measure, in terms of energy demand reduction and impact on household energy bills.
- In accordance with a Fabric First approach, we recommend that BBC implement Typical Retrofit – Stage 1, across their portfolio. In summary, this consists of:
    - Loft insulation
    - External wall insulation
- As highlighted, improving the fabric further than this (via windows, doors, and ground floor insulation) is neither cost effective nor carbon effective, when assessed over a 20-year period.
- Assuming that PAS2035 principles are followed, we can be confident that a Typical Retrofit (Stage 1) will result in the following outcomes:
    - Each property will be free from building defects.
    - Each property will be warmer and more comfortable, with associated health benefits.
    - Each property, still heated by gas, will require between 12% - 24% less to be spent on energy bills annually.
    - The fabric and thermal performance of each property will have been improved sufficiently to comply with BUS funding for electric heating upgrades.
- The cost for Typical Retrofit Stage 1 is estimated to be between £11,590 and £35,633, depending on the property type. This is the estimated Capital Cost for loft insulation and EWI, and other allowances set out at Section 6.1.
- It is recommended that BBC investigate potential funding schemes to meet the initial upfront investment for Typical Retrofit Stage 1 fabric improvements. Potential schemes that would be suitable include:
    - Energy Company Obligation (ECO) (OFGEM, 2025).
    - Warm Homes: Social Housing Fund (DofESNZ, 2024).
    - Great British Insulation Scheme (GBIS) (DofESNZ, 2023) .
- It can be concluded that Low Carbon Heating is the single most impactful measure, in terms of Net Lifetime Carbon Reduction. This is driven by the shift to electricity from gas.
- Low Carbon Heating installations are anticipated to cost between £12,200 - £14,118 per property.
- Following the implementation of Typical Retrofit Stage 1, the fabric and thermal performance of each property will have been improved sufficiently to ensure that, post Retrofit Stage 2 (Low Carbon Heating), the energy bills will be between 8%-22% lower than the pre-retrofit scenario.
- We recommend that following Stage 1, BBC implement Typical Retrofit Stage 2 (Low Carbon Heating). We can be confident that this will result in the following outcomes:

    - Treated properties will become ‘Net Zero ready’ (see Section 1.5).
    - Generic properties will emit between 94%-95% less operational carbon emissions, equating to between 51tonnes and 81tonnes saved per property over a 20-year period.
    - The specific property type (bungalow) will emit approximately 92% less operational carbon emissions, equating to approximately 36tonnes over a 20-year period.
    - Energy bills for occupants will not increase.
    - ASHP installations will perform optimally based on improved fabric performance.
- Subject to the agreed funding strategy and the level of funding available, there are likely to be financial efficiencies associated with implementing Retrofit Stage 1 and 2 in combination.
- It is recommended that BBC investigate potential funding schemes to meet the initial upfront investment for Typical Retrofit Stage 2 low carbon heating upgrades. Potential schemes that would be suitable include:
    - Energy Company Obligation (ECO) (OFGEM, 2025).
    - Warm Homes: Social Housing Fund (DofESNZ, 2024).
    - Boiler Upgrade Scheme (BUS) (DofESNZ, 2022).
- Solar installations are consistently not effective in reducing Whole Life Carbon. This is because the embodied carbon is higher than the operational carbon savings, over a 20-year period.
- Solar installations result in the most attractive financial payback, compared to fabric and low carbon heating improvements.
- It is not recommended that BBC invest in Retrofit Stage 3 (Renewable Energy), since the there is a negative Whole Life Carbon impact over a 20-year period. Occupiers should be made aware of the potential benefits in relation to their energy bills, should they wish to invest.

9.4 Social Housing: Projections

Within this section, estimated projections are provided for Social Housing within Broxtowe Borough Council, in relation to aggregated retrofit costs and carbon savings.

9.4.1 Housing Quantity

As reported in previous sections (see Section 1.8), social housing accounts for around 14% (n=5,157) of Broxtowe’s entire stock.
Table *68* and

Table 69 provide more granular social housing information. First,
Table *68* provides a basic cross-tabulation of property type versus building form, while

Table 69 presents energy efficiency statistics per property-build type of interest (detached, semi-detached, mid- and end-terrace houses, flats and detached bungalows). Note that the number of observations reduces to 4,914 in
Table *68* as built form information was not available for ~250 properties.

Table 68: Property type versus building form in Broxtowe for social housing (n=4,914)

	Detached	Semi-detached	Mid-Terrace	End-Terrace	Total
Bungalow	128 (2.60)	291 (5.92)	122 (2.48)	137 (2.79)	678 (13.80)
House	33 (0.67)	763 (15.53)	628 (12.78)	453 (9.22)	1,877 (38.20)
Flat	NA	NA	NA	NA	2,061 (41.94)

Maisonette	64 (1.30)	152 (3.09)	35 (0.71)	47 (0.96)	298 (6.06)
Total	**670**	**2,036**	**1,293**	**915**	**4,914**

Table 69 - Energy efficiency characteristics for socially rented houses, flats and detached bungalows, disaggregated by building form (% EPC A–C versus D–G within property-build type in parentheses

Property type	Building form	EPC A–C	EPC D–G	Median SAP
Houses (n=1877)	*Detached*	6 (18.18)	27 (81.82)	63
	Semi-detached	278 (36.44)	485 (63.56)	67
	Mid-terrace	351 (55.89)	277 (44.11)	69
	End-terrace	188 (41.50)	265 (58.50)	67
Flats (n=2061)	*All flats*	1,693 (74.32)	585 (25.68)	73
Bungalows (n=128)	*Detached*	15 (11.72)	113 (88.28)	66

Table 70 projects the total quantity of Social Housing in Broxtowe, according to property type. As shown, the seven property types analysed within this report represent 57% of all Social Housing within the Borough.

Table 70: Quantity of Social Housing per property type within Broxtowe Borough Council

Property Type	Generic/Specific	Actual Data	%	Projected
Detached	Generic	33	1%	35
Semi-Detached	Generic	763	16%	801
Mid-Terraced House	Generic	628	13%	659
End-Terraced House	Generic	453	9%	475
Mid-Terraced Flat	Generic	508	10%	533
End-Terraced Flat	Generic	278	6%	292
Detached Bungalow	Specific	128	3%	134
Total (Exc. Other)		**2,791**	**57%**	**2,929**
Other Property Types		2,123	43%	2,228
Total		**4,914**	**100%**	**5,157**

9.4.2 Capital Costs

Fabric Improvement Measures

Using the projected quantities set out within Table 70, Table 71 estimates the total Capital Cost to implement the recommended Retrofit Stage 1 (Fabric Improvement) measures.

Table 71: Projected costs for Typical Retrofit Stage 1 (Fabric Improvement) – Social housing

Typical Retrofit - Stage 1 (Fabric Improvement)			
Property Type	**Quantity**	**Capital Cost**	**Total**
Detached	35	£35,632.65	£1,234,025.14
Semi-Detached	801	£25,494.28	£20,414,051.42
Mid-Terraced House	659	£17,301.72	£11,402,782.74
End-Terraced House	475	£26,983.10	£12,827,795.91

Mid-Terraced Flat	533	£12,114.17	£6,458,317.26
End-Terraced Flat	292	£14,671.43	£4,280,350.77
Detached Bungalow (Specific)	134	£16,354.11	£2,196,842.20
Total (Exc. Other)	**2,929**		**£58,814,165.44**
Other Property Types	2,228	Exc.	Exc.

- The seven property types represent 57% of the total number of social housing properties in Broxtowe.
- The projected cost to implement Typical Retrofit Stage 1 Fabric Improvement across 2,929 social housing properties in Broxtowe, is approximately £58.8m.
- This projected cost does not account for potential available funding, which is discussed in previous sections.
- For EWI and loft insulation, Broxtowe Borough Council should be able to access at least £7,500 per social housing property (DofESNZ, 2024). This represents £22.0m or 37% of the total cost.

Low Carbon Heating Measures

Using the projected quantities set out within Table 70, Table 72 estimates the total Capital Cost to implement the recommended Retrofit Stage 2 (Low Carbon heating) measures.

Table 72: Projected costs for Typical Retrofit Stage 2 (Low Carbon Heating) – Social housing

Typical Retrofit - Stage 2 (Low Carbon Heating)			
Property Type	**Quantity**	**Cost**	**Total**
Detached	35	£12,199.52	£422,492.17
Semi-Detached	801	£12,288.86	£9,840,064.83
Mid-Terraced House	659	£12,396.37	£8,169,890.96
End-Terraced House	475	£12,273.32	£5,834,749.29
Mid-Terraced Flat	533	£7,155.83	£3,814,920.59
End-Terraced Flat	292	£7,114.83	£2,075,733.43
Bungalow (Specific)	134	£12,323.44	£1,655,404.17
Total (Exc. Other)	**2,929**		**£31,813,255.45**
Other Property Types	2,228	Exc.	Exc.

- The seven property types represent 57% of the total number of social housing properties in Broxtowe.
- The projected cost to implement Typical Retrofit Stage 2 Low Carbon Heating across 2,929 social housing properties in Broxtowe, is approximately £31.8m.
- This projected cost does not account for potential available funding, which is discussed in previous sections.
- For Low Carbon Heating, Broxtowe Borough Council should be able to access £7,500 per social housing property (DofESNZ, 2022). This represents approximately £22m, or 70% of the total cost of low carbon heating.

9.4.3 Carbon Savings

Fabric Improvement Measures

Using the projected quantities set out within Table 70, Table 73 estimates the total Net Lifetime Carbon Savings following the implementation of Retrofit Stage 1 (Fabric Improvement) measures.

Table 73: Projected carbon savings for Typical Retrofit Stage 1 (Fabric Improvement) – social housing

Property Type	Quantity	Net Lifetime Carbon Reductions	
		Per Property (tCO_2e)	Total (tCO_2e)
Detached	35	23	805
Semi-Detached	801	17	13,744
Mid-Terraced House	659	38	25,335
End-Terraced House	475	43	20,564
Mid-Terraced Flat	533	23	12,041
End-Terraced Flat	292	23	6,713
Detached Bungalow (Specific)	134	10	1,338
Total (Exc. Other)	**2,929**		**80,540**
Other Property Types	2,228	Exc.	Exc.

- The seven property types represent 57% of the total number of social housing properties in Broxtowe.
- Implementing Typical Retrofit Stage 1 Fabric Improvement across 2,929 social housing properties will result in approximately 80,540tonnes of CO_2e saved, over a 20-year period.
- On average, a mature tree absorbs roughly 21kg of CO_2e per year (Viessmann, 2022). 80,540tonnes of CO_2e therefore equates to the carbon absorbed by roughly 3.8million mature trees in one year. This translates to an area of roughly 35km^2, similar in size to the city of Tamworth.

Low Carbon Heating Measures

Using the projected quantities set out within Table 70, Table 74 estimates the total Net Lifetime Carbon Savings following the implementation of Retrofit Stage 1 (Fabric Improvement) measures.

Table 74: Projected carbon savings for Typical Retrofit Stage 2 (Low Carbon Heating) – social housing

Property Type	Quantity	Net Lifetime Carbon Reductions	
		Per Property (tCO_2e)	Total (tCO_2e)
Detached	35	29	1,010
Semi-Detached	801	28	22,037
Mid-Terraced House	659	28	18,762
End-Terraced House	475	31	14,956
Mid-Terraced Flat	533	26	13,816
End-Terraced Flat	292	34	9,864
Detached Bungalow (Specific)	134	21	2,830
Total (Exc. Other)	**2,929**		**83,275**
Other Property Types	2,228	Exc.	Exc.

- The seven property types represent 57% of the total number of social housing properties in Broxtowe.
- Implementing Typical Retrofit Stage 2 Low Carbon Heating across 2,929 social housing properties will result in approximately 83,275tonnes of CO_2e saved, over a 20-year period.
- On average, a mature tree absorbs roughly 21kg of CO_2e per year (Viessmann, 2022). 83,275tonnes of CO_2e therefore equates to the carbon absorbed by roughly 4 million mature trees in one year. This translates to an area of roughly 38km^2, similar in size to the town of Cambridge.

9.5 Combined Total: Projections

Within this section, estimated projections are provided for all properties within Broxtowe Borough Council, in relation to aggregated retrofit costs and carbon savings.

9.5.1 Housing Quantity

As reported in previous sections (see Section 1.8), there are a total of 36,993 properties in Broxtowe Borough Council. Table 75 highlights that the seven property types analysed within this technical report represent 86% of the total number of properties in Broxtowe.

Table 75: Property type and quantity in Broxtowe (n=36,993)

Typical Retrofit - Stage 1 (Fabric Improvement)		
Property Type	**Quantity**	**%**
Detached	7,607	21%
Semi-Detached	11,105	30%
Mid-Terraced House	4,559	12%
End-Terraced House	3,111	8%
Mid-Terraced Flat	1,324	4%
End-Terraced Flat	951	3%
Detached Bungalow (Specific)	3,016	8%
Total (Exc. Other)	**31,673**	**86%**
Other	5,320	14%
Total	**36,993**	**100%**

9.5.2 Capital Costs

Fabric Improvement Measures

Using the projected quantities set out within Table 75, Table 76 estimates the total Capital Cost to implement the recommended Retrofit Stage 1 (Fabric Improvement) measures.

Table 76: Projected costs for Typical Retrofit Stage 1 (Fabric Improvement) – total

Typical Retrofit - Stage 1 (Fabric Improvement)			
Property Type	**Quantity**	**Cost**	**Total**
Detached	7,607	£35,632.65	£271,057,548.51
Semi-Detached	11,105	£25,494.28	£283,113,937.59
Mid-Terraced House	4,559	£17,301.72	£78,878,531.90
End-Terraced House	3,111	£26,983.10	£83,944,427.50
Mid-Terraced Flat	1,324	£12,114.17	£16,039,161.81
End-Terraced Flat	951	£14,671.43	£13,952,534.40

Detached Bungalow (Specific)	3,016	£16,354.11	£49,323,995.67
Total (Exc. Other)	**31,673**		**£796,310,137.40**
Other Property Types	5,320	Exc.	Exc.

- The seven property types represent 86% of the total number of properties in Broxtowe.
- The projected cost to implement Typical Retrofit Stage 1 Fabric Improvement across 31,673 properties in Broxtowe, is approximately £796m.
- This projected cost does not account for potential available funding, which would be subject to the occupier and property tenure type.

Low Carbon Heating Measures

Using the projected quantities set out within Table 75, Table 77 estimates the total Capital Cost to implement the recommended Retrofit Stage 2 (Low Carbon heating) measures.

Table 77: Projected costs for Typical Retrofit Stage 2 (Low Carbon Heating) – Total

Typical Retrofit - Stage 2 (Low Carbon Heating)			
Property Type	**Quantity**	**Cost**	**Total**
Detached	7,607	£12,199.52	£92,801,748.98
Semi-Detached	1,1105	£12,288.86	£136,467,741.93
Mid-Terraced House	4,559	£12,396.37	£56,515,064.72
End-Terraced House	3111	£12,273.32	£38,182,295.11
Mid-Terraced Flat	1,324	£7,155.83	£9,474,314.47
End-Terraced Flat	9,51	£7,114.83	£6,766,207.65
Bungalow (Specific)	3,016	£12,323.44	£37,167,507.21
Total (Exc. Other)	**31,673**		**£377,374,880.08**
Other Property Types	5,320	Exc.	Exc.

- The seven property types represent 86% of the total number of properties in Broxtowe.
- The projected cost to implement Typical Retrofit Stage 2 Low Carbon Heating across 31,673 properties in Broxtowe, is approximately £377m.
- This projected cost does not account for potential available funding, which is discussed in previous sections.
- For Low Carbon Heating, Broxtowe Borough Council should be able to access £7,500 per property. This represents approximately £238m, or 63% of the total cost of low carbon heating.

Combined

Using the projected quantities set out within Table 75, Table 78 estimates the total Capital Cost to implement both the Retrofit Stage 1 and 2 measures.

Table 78: Projected costs for Combined Typical Retrofit Stage 1 & 2 – Total

Typical Retrofit - Combined Stage 1 and Stage 2			
Property Type	**Quantity**	**Cost**	**Total**
Detached	7,607	£47,832.17	£363,859,297.49
Semi-Detached	11,105	£37,783.13	£419,581,679.53
Mid-Terraced House	4,559	£29,698.09	£135,393,596.62
End-Terraced House	3,111	£39,256.42	£122,126,722.61

Mid-Terraced Flat	1,324	£19,270.00	£25,513,476.28
End-Terraced Flat	951	£21,786.27	£20,718,742.05
Bungalow (Specific)	3,016	£28,677.55	£86,491,502.89
Total (Exc. Other)	**31,673**		**£1,173,685,017.47**
Other Property Types	5,320	Exc.	Exc.

- The projected cost to implement Typical Retrofit - Combined Stage 1 and Stage 2 across 31,673 properties in Broxtowe is approximately £1.17bn.
- This projected cost does not account for potential available funding, which is discussed in previous sections.

9.5.3 Carbon Savings

Fabric Improvement Measures

Using the projected quantities set out within Table 75, Table 79 estimates the total Net Lifetime Carbon Savings following the implementation of Retrofit Stage 1 (Fabric Improvement) measures.

Table 79: Projected carbon savings for Typical Retrofit Stage 1 (Fabric Improvement) – Total

Property Type	**Quantity**	**Net Lifetime Carbon Reductions**	
		Per Property (tCO_2e)	**Total (tCO_2e)**
Detached	7,607	23	176,914
Semi-Detached	11,105	17	19,0607
Mid-Terraced House	4,559	38	175,253
End-Terraced House	3,111	43	134,571
Mid-Terraced Flat	1,324	23	29,902
End-Terraced Flat	951	23	21,883
Detached Bungalow (Specific)	3,016	10	30,042
Total (Exc. Other)	**31,673**		**759,173**
Other Property Types	5,320	Exc.	Exc.

- The seven property types represent 86% of the total number of properties in Broxtowe.
- Implementing Typical Retrofit Stage 1 Fabric Improvement across 31,673 properties will result in approximately 759,173tonnes of CO_2e saved, over a 20-year period.
- On average, a mature tree absorbs roughly 21kg of CO_2e per year (Viessmann, 2022). 759,173tonnes of CO_2e therefore equates to the carbon absorbed by roughly 36.2million mature trees in one year. This translates to an area of roughly 345km^2, similar in size to the Isle of Wight.

Low Carbon Heating Measures

Using the projected quantities set out within Table 75, Table 80 estimates the total Net Lifetime Carbon Savings following the implementation of Retrofit Stage 1 (Fabric Improvement) measures.

Table 80: Projected carbon savings for Typical Retrofit Stage 2 (Low Carbon Heating) – total

Property Type	**Quantity**	**Net Lifetime Carbon Reductions**	
		Per Property (tCO_2e)	**Total (tCO_2e)**
Detached	7,607	29	221,887

Semi-Detached	11,105	28	305,625
Mid-Terraced House	4,559	28	129,787
End-Terraced House	3,111	31	97,872
Mid-Terraced Flat	1,324	26	34,311
End-Terraced Flat	951	34	32,153
Detached Bungalow (Specific)	3,016	21	63,532
Total (Exc. Other)	**31,673**		**885,168**
Other Property Types	5,320	Exc.	Exc.

- The seven property types represent 86% of the total number of properties in Broxtowe.
- Implementing Typical Retrofit Stage 2 Low Carbon Heating across 31,673 properties will result in approximately 885,168tonnes of CO_2e saved, over a 20-year period.
- On average, a mature tree absorbs roughly 21kg of CO_2e per year (Viessmann, 2022). 885,168tonnes of CO_2e therefore equates to the carbon absorbed by roughly 42.1million mature trees in one year. This translates to an area of roughly 402km^2, similar to the size to the County of Rutland.

Combined

Using the projected quantities set out within Table 75, Table 81 estimates the total Net Lifetime Carbon Savings following the implementation of the combined Retrofit Stage 1 and 2 measures.

Table 81: Projected carbon savings for Combined Typical Retrofit Stage 1 & 2 – total

Property Type	Quantity	Net Lifetime Carbon Reductions (tCO2e)	
		Per Property (tCO2e)	Total (tCO2e)
Detached	7,607	52	398,801
Semi-Detached	11,105	45	496,233
Mid-Terraced House	4,559	67	305,040
End-Terraced House	3,111	75	232,443
Mid-Terraced Flat	1,324	48	64,214
End-Terraced Flat	951	57	54,036
Detached Bungalow (Specific)	3,016	31	93,574
Total (Exc. Other)	**31,673**		**1,644,341**
Other	0	Exc.	Exc.

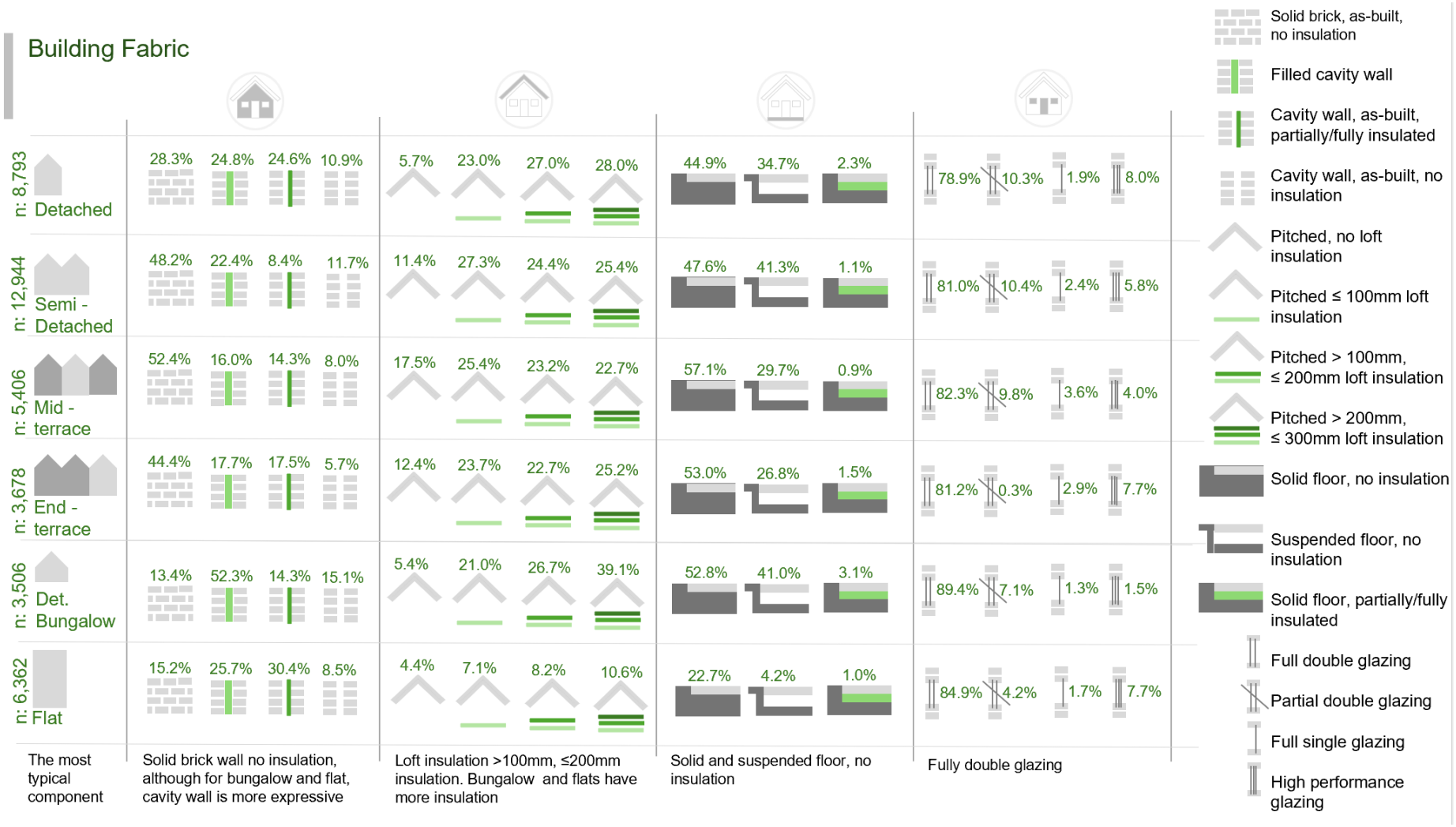
- Implementing Typical Retrofit – Combined Stage 1 and Stage 2 across 31,673 properties will result in approximately 1,644,341 tonnes of CO_2e saved over a 20-year period.
- On average, a mature tree absorbs roughly 21 kg of CO_2e per year (Viessmann, 2022). 1,644,341 tonnes of CO_2e therefore equates to the carbon absorbed by roughly 78.3 million mature trees in one year. This translates to an area of roughly 748 km², which is almost double the size of the Isle of Wight (380.7 km²).

10 Appendices

This section contains any appendix cross-referenced in the report.

10.1 Appendix A: Building Fabric

Typical building fabric breakdown



10.2 Appendix B: Embodied Carbon Data Exports

Data spreadsheet to be made available on request.

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Appendix 2

Broxtowe Housing Decarbonisation Roadmap

Executive Summary

In early 2024 Nottingham University Consultants and Develeco Projects Ltd were commissioned to identify cost-effective retrofit opportunities to help decarbonise Broxtowe's housing stock, as part as Broxtowe County Council's commitment to meet 2050 net-zero carbon emission targets.

The team built upon the work developed for Nottingham City Council through the £220 million UK Community Renewal Fund between 2021 and 2022. A significant part of this work was focused on developing a method to look at carbon-cost effectiveness of housing retrofit strategies. This method was further developed, updated and applied to examine Broxtowe's housing stock.

In this report, we present the findings in detail. The report is divided into the following sections:

Section 1. Establishing the status quo: in addition to establishing targets, benchmarks and approaches, this also contain a housing stock characterisation and a fuel poverty analysis.

Section 2. Generic housing performance assessment: this section uses generic dynamic building simulation models representing the main housing typologies as identified in Section 1 to quantify the implications (in terms of energy/carbon reduction and running costs) of fabric retrofit alongside low carbon heating and renewable energy integration.

Section 3. Generic housing embodied carbon calculations: the generic models representing the main housing typologies used in Section 2 were used to calculate the embodied carbon emissions of each retrofit strategy (Life Cycle Stages A1-A5, B1-B5, and C1-C43).

Section 4. Specific housing performance assessment: the method used for the generic models in Section 2 were applied to selected properties to quantify the implications (in terms of energy/carbon reduction and running costs) of fabric retrofit alongside low carbon heating and renewable energy integration.

Section 5. Specific housing embodied carbon calculations: the method used for the generic models in Section 3 were applied to the selected properties in Section 4 to calculate the embodied carbon emissions of each retrofit strategy (Life Cycle Stages A1-A5, B1-B5, and C1-C43.

Section 6. Lifetime capital cost of retrofit: the lifetime capital cost for each typology was calculated using the materials, specifications, and quantities as set out within Section **Error! Reference source not found.**, 3, 4 and 5.

Section 7. Net lifetime cost of retrofit: the net lifetime cost for each typology was calculated considering the lifetime capital cost of the works minus the lifetime cost savings, using the annual energy costs taken from Sections 2 and 4 and the lifetime capital cost data from Section 6.

Section 8. Carbon-cost effectiveness: the cost of the retrofit investment per tonne of carbon dioxide equivalent saved from the atmosphere over the lifetime of the retrofitted property was calculated for each of the properties studied.

Section 9. Broxtowe housing decarbonisation roadmap: in this section, the key data outputs for each typology are summarised and recommendations are suggested alongside estimated projections.

Section 10 is comprised of appendices and Section 11 is a list of references.

Why retrofit?

Retrofitting UK homes is essential for several reasons. First, it enhances environmental sustainability by reducing carbon emissions and improving the longevity of the housing stock. This is crucial for tackling climate change and preserving the environment for future generations. Second, retrofitting improves household energy efficiency, leading to lower energy bills. By upgrading insulation and installing energy-efficient systems, homes will require less energy to maintain comfortable temperatures, resulting in significant cost savings for homeowners and tenants. Third, retrofitting generates local and domestic economic opportunities. As the demand for retrofitting increases, so does the need for skilled labour and the production of energy-efficient materials. This can stimulate local economies and create new job opportunities within the construction industry. Lastly, retrofitting significantly improves the quality of life for occupants. Energy-efficient homes provide consistent temperatures and better air quality, enhancing health and comfort. This is particularly beneficial for vulnerable groups such as the elderly and disabled. Importantly, lower energy costs can help alleviate fuel poverty, making it easier for households to afford other essentials. *Overall, retrofitting homes in the UK is essential for fighting climate change, cutting energy bills, boosting the economy, and improving living conditions. By investing in retrofitting, the UK can create a more sustainable and comfortable future for everyone.*

What is the quality of the homes in Broxtowe?

An overview of the current condition of Broxtowe's complete housing stock (including owner-occupied, privately rented and socially rented) was established utilising data from the Energy Performance Certificate (EPC) database as of April 2024. The EPC database provides details on a building's energy use, typical energy costs, and

recommendations for improving energy efficiency. As is typical to the UK, the most common dwelling types in Broxtowe are detached, semi-detached, mid- and end-terrace houses, flats, and detached bungalows, collectively accounting for approximately 95% of the area's properties. Further analysis of the archetypes showed that houses constructed from 1900–1966, flats constructed from 1900–1929 and 1950–1975, as well as detached bungalows constructed from 1950–1975 are less energy efficient (i.e., have EPC ratings D–G) than homes built during other periods. These homes with lower EPC ratings, which make up approximately 66% of Broxtowe's housing stock, have several key characteristics that need improvement. Characteristically, they often feature no or older insulation, outdated heating systems, and single-glazed windows, all which result in higher energy consumption and costs. These homes typically require substantial retrofit upgrades, including better insulation, more efficient heating systems, and possibly the addition of renewable energy sources, to improve their overall energy efficiency. *As these homes tend to have the highest energy costs and the poorest indoor conditions, and given the estimated number found in Broxtowe, they are a priority for retrofitting.*

Why do we need to consider fuel poverty?

Fuel poverty occurs when a household cannot afford to heat their home to an adequate temperature due to a combination of low-income, high-energy costs, and poor energy efficiency of the property. In the UK, a household is considered to be in fuel poverty if it needs to spend a high proportion of its income on energy to maintain a satisfactory heating regime. The government uses the Low Income Low Energy Efficiency (LILEE) definition for fuel poverty in England. Under this definition, a household is considered fuel poor if it lives in a property with an energy efficiency rating of band D or below and, after spending the required amount on energy, its residual income falls below the official poverty line. Fuel poverty can have serious implications for health and well-being, as cold homes can exacerbate conditions such as respiratory and cardiovascular diseases. It can also lead to higher energy bills, forcing households to make difficult choices between heating their homes and other essential expenses. *The rate of LILEE fuel poverty in Broxtowe is 13.5%, which is slightly higher than the English average of 13.1%, but lower than the typical rate across the East Midlands (15.1%).* To get a better understanding of these fuel poverty statistics, a mapping assessment was undertaken to analyse the spatial distribution of LILEE fuel poverty versus deprivation. The findings indicate that the LILEE definition likely underestimates the true extent of fuel poverty in Broxtowe (and across England), justifying further exploration of subjective fuel poverty rates. Additionally, a rough estimation was done to identify the financially vulnerable households that are omitted by default from LILEE statistics, i.e., those where the main earner is economically inactive and living in a property with an EPC rating of A–C. It was estimated that 1,251 homes fit this description and would likely be categorised as fuel poor according to other fuel poverty definitions. *Knowing the true*

extent of fuel poverty can drive retrofit initiatives to improve the energy efficiency of homes in Broxtowe, including identifying how to target assistance more effectively.

What immediate needs does the analysis reveal?

Using data from the EPC database, a housing characterisation review for Broxtowe was conducted to identify key factors to guide the retrofit approach. From this, it was found that 66% of Broxtowe's housing is rated D-G and therefore can be considered energy inefficient and likely need retrofitting to improve performance. Additionally, 88% of Broxtowe's housing stock has gas boilers as the source of heating. The most common wall construction in detached (27.7%), semi-detached (47.5%) and terraced homes (41.9-51.3%) is solid brick with no insulation, and partially/fully insulated cavity walls for flats (30.1%) and filled cavity walls for bungalows (53.5%). Altogether, the proportion of uninsulated and partially insulated cavity walls present a great opportunity for less disruptive fabric improvements across all homes.

EPC data also showed that Broxtowe's housing stock has a large proportion of homes with non-insulated floors – between 44-60% across all typologies. Retrofitting these uninsulated solid ground floors is relatively uncommon because it often requires completely rebuilding the floor, resulting in higher costs and significant disruption for the occupants. Roof insulation is common, but the thickness varies greatly. More than 80% of properties already have double glazing.

We classified retrofit measures as ‘typical’ and ‘deep’. Typical retrofit measures (e.g. adding roof or wall insulation) are those which are generally easier and less expensive to implement, causing minimal disruption to occupants. They typically result in moderate energy savings and performance improvements. Deep retrofit measures, on the other hand, involve comprehensive upgrades across multiple systems, such as the building envelope (e.g., floor insulation), electrical, structural, and mechanical components. These extensive upgrades lead to higher upfront costs and greater disruption for occupants compared to typical retrofits. However, deep retrofit measures can achieve significant performance enhancements and long-term energy savings. *On the whole, the extent to which energy consumption and carbon emissions are reduced depends on the type of retrofit approach implemented and the type of property.*

So, what should be addressed first and why?

Upgrading the building fabric is recommended as the first measure in the retrofit process to improve the energy efficiency of homes. Key measures should include insulating the houses to minimise heat loss through the fabric and improving the airtightness barrier to reduce uncontrolled ventilation between the interior and exterior which is often seen in 'leaky' and draughty homes.

Roof insulation is the easiest retrofit measure and can be one of the first steps in a fabric upgrade. Wall insulation, however, was identified as the most significant fabric

measure, proving more effective than other retrofit strategies across all house types. This effectiveness is due to the larger exposed envelope area of the walls compared to other fabric elements. Therefore, retrofitting walls should be prioritised whenever possible.

Installing an air source heat pump (ASHP) proved to be a cost-effective measure for most of the house types tested. Its cost-effectiveness was further enhanced when combined with external wall insulation and draught-proofing.

How much energy could be saved because of implementing the recommended measures?

Overall, the performance analysis indicated that upgrading the fabric and draught-proofing layer could reduce heating demand by up to 86% with extensive fabric measures (deep retrofit). *When fewer, less disruptive, and less expensive fabric measures were considered (typical retrofit), heating demand could be reduced by up to 70% compared to a leaky and non-insulated scenario, depending on the housing archetype.* A breakdown of this is shown for each archetype in Table 0.1.

Table 1: Percentage reduction in heating demand achieved with deep and typical retrofit measures across different heating systems in comparison to a leaky and non-insulated building

Archetype	Deep retrofit measures	Typical retrofit measures
Detached house	81%	61%
Semi-detached	83%	58%
Mid-terrace	86%	70%
End-terrace	86%	70%
Mid-terrace flat	80%	61%
End-terrace flat	81%	52%
Bungalow*	84%	54%

**Bungalow analysis considered a specific housing model, not a generic archetype*.

Greater reductions in total annual energy demand were observed when the traditional gas heating system was replaced with a low-carbon heating system, due to its high efficiency. We assumed a typical efficiency of 0.89 and a seasonal coefficient of performance of 0.8 for a gas boiler and took a realistic approach to the ASHP performance by varying the SCOP from 1.8 to 2.8 for space heating across different retrofit scenarios. Replacing a gas boiler with an ASHP reduced annual energy demand by up to 78% with deep retrofit measures, while maintaining a gas boiler reduced it by up to 61% compared to a leaky and non-insulated building with gas heating. *With typical retrofit measures, total annual energy demand was reduced by up to 73% with an ASHP and up to 49% with a gas boiler, compared to a leaky and non-insulated gas-heated building.* However, it should be noted that the cost-effectiveness of the ASHP compared to the gas boiler will depend on the energy costs of electricity and gas. This breakdown is shown in Table 0.2.

Table 2: Percentage reduction in total energy achieved with deep and typical retrofit measures across different heating systems in comparison to a leaky and non-insulated gas-supplied building

		Deep retrofit measures	Typical retrofit measures
Detached house	Gas boiler	28%	21%
	ASHP	38%	28%
Semi-detached	Gas boiler	22%	15%
	ASHP	42%	32%
Mid-terrace	Gas boiler	33%	27%
	ASHP	33%	20%
End-terrace	Gas boiler	36%	29%
	ASHP	36%	25%
Mid-terrace flat	Gas boiler	27%	20%
	ASHP	38%	31%
End-terrace flat	Gas boiler	30%	19%
	ASHP	41%	29%
Bungalow*	Gas boiler	19%	12%
	ASHP	28%	20%

*Bungalow analysis considered a specific housing model, not a generic archetype.

Considering the energy price cap that was in place from October to December 2024 (the most recent price cap at the time of the analysis), replacing a gas boiler with an ASHP can reduce annual energy costs by up to 42% when deep retrofit measures are implemented. In comparison, maintaining a gas boiler can lower costs by up to 36% compared to a leaky, non-insulated building. When typical retrofit measures are considered, annual energy costs can be reduced by up to 32% with an ASHP and by up to 29% with a gas boiler, compared to a leaky, non-insulated gas-supplied building. This energy cost analyses suggested that switching to ASHP resulted in marginally lower annual costs compared to a traditional heating system. It is noted that the adoption of ASHP can help transition to net zero greenhouse gases, and energy costs can be further reduced depending on the electricity cost incentives.

What is the impact of implementing retrofit measures on embodied carbon?

Embodied carbon calculations involve assessing the total greenhouse gas emissions associated with the production, transportation, installation, maintenance, and disposal of building materials, measured in carbon dioxide equivalent (CO_2e). In this project, embodied carbon was considered for the key archetypes and for typical versus deep retrofit measures – this is one of a few instances when the embodied carbon of retrofit was considered in the UK. From this, it was determined that - across all property types - implementing a typical retrofit, as opposed to a deep retrofit, results in a saving of roughly 30-40% in embodied carbon. For example, in the case of a detached house, a deep retrofit results in 12.4 tonnes of CO_2e, whereas a typical retrofit generates 8.7 tonnes of CO_2e. This additional 3.7 tonnes of CO2 must be saved in operational carbon emissions over the lifetime of the property

to make the deep retrofit scenario worthwhile. This is not unexpected since the deep retrofit utilises more materials and requires more work.

In the specific embodied carbon calculations undertaken for the specific house type, i.e. the bungalow typology, this trend is replicated. The calculations estimated that typical retrofit results in approximately 28% less embodied carbon compared to a deep retrofit. Specifically, a deep retrofit generates 12.9 tonnes of CO_2e, while a typical retrofit produces 9.3 tonnes of CO_2e. Therefore, the additional 3.6 tonnes of CO_2e from a deep retrofit must be offset by savings in operational carbon emissions over the property's lifetime to justify the deep retrofit. *This concludes that while retrofitting aims to reduce operational carbon emissions by improving energy efficiency, it can also introduce embodied carbon due to the materials and processes involved. To some extent, careful selection of materials and a focus on long-term operational savings can help mitigate its impact.*

What are the cost implications of retrofit measures?

The cost implications of retrofit measures can vary significantly based on their *type and extent*. Key factors to review include *initial cost, payback period, operational savings, embodied carbon, and cost effectiveness.* Typical retrofits, which include roof insulation, draught-proofing, and window upgrades, are generally less expensive and less disruptive, offering moderate energy savings. In contrast, deep retrofits involve comprehensive upgrades such as floor insulation and the installation of advanced heating systems like ASHPs. Although these deep retrofits have higher initial costs due to the extensive work required, they provide substantial long-term energy savings – and significantly improved comfort (which was outside the scope of this work). The payback period for retrofit measures depends on the energy savings achieved and the initial investment, with typical retrofits having a shorter payback period due to lower upfront costs, while deep retrofits take longer to pay off but offer greater savings over time. Despite having higher embodied carbon due to the extensive materials and work involved, deep retrofits can offset this through operational carbon savings over the building's lifetime, making them more environmentally beneficial in the long run. Additionally, it is important to note that the cost-effectiveness of retrofit measures can be influenced by factors such as energy prices, government incentives, and the specific characteristics of the building, with the relative costs of electricity and gas playing a role in the cost-effectiveness of ASHPs compared to gas boilers.

What next for Broxtowe?

Based on the findings of this project, that are discussed in detail across this report, the following recommendations can be made:

Recommendation 1 – Take a fabric-first approach. By prioritising improvements to the building's envelope, such as insulation and airtightness improvements, this method can lead to substantial energy savings by reducing the need for

supplementary heating and improving overall energy efficiency. Other benefits include healthier and more comfortable indoor conditions for occupants and reduced operational costs and carbon emissions. As a starting point, the implementation of roof and external wall insulation would be the most impactful in any retrofit strategy.

Recommendation 2 – Integrate a comprehensive framework for managing and delivering retrofit projects and initiatives. The quality assurance process in retrofitting, particularly under the PAS 2035 framework, involves several key steps to ensure that retrofit projects are carried out effectively and meet high standards. By following a framework such as PAS 2035, Broxtowe Borough Council can ensure that their retrofit projects and initiatives deliver the desired energy savings and improvements in building performance without compromising on quality or safety.

Recommendation 3 – Consider the distinct characteristics and benefits of typical versus deep retrofit. Overall, while typical retrofits are suitable for achieving moderate improvements with lower upfront costs, deep retrofits are ideal for those seeking significant energy efficiency gains and long-term benefits. However, the comprehensive upgrades required for deep retrofit, such as floor insulation and advanced heating systems, require substantial investment and extensive work. Consequently, the payback period for deep retrofits can be quite long, making them less financially viable. Additionally, the financial benefits of deep retrofits can be influenced by fluctuating energy prices and the availability of government incentives. Without substantial financial support, the high costs and long payback periods make deep retrofits challenging to justify financially.

Recommendation 4 – Review the cost-carbon effectiveness as part of the decision making. From a whole life carbon reduction perspective, typical retrofits are more effective than deep retrofits when assessed over a 20-year period. They consistently cost less and result in greater whole life carbon savings, making them more carbon cost-effective overall.

Recommendation 5 – When planning a retrofit, consider that costs can vary significantly depending on the type and extent of the measures implemented. The retrofit process in this report is divided into three key stages. Stage 1 focuses on fabric improvements to reduce operational energy consumption and carbon emissions. Stage 2 builds on Stage 1 by integrating low-carbon heating systems. Stage 3 further enhances Stage 2 by incorporating renewable energy generation. For example, based on the assumptions outlined in this report, the cost for Typical Retrofit Stage 1 is estimated to be between £11,590 and £35,633, depending on the property type and as relates mainly to estimated capital cost for roof and external wall insulation and other factors detailed in the report. Building up on this, for Typical Retrofit Stage 2 (add low carbon heating), will result in energy bills being 8% to 22% lower than the pre-retrofit scenario, at an estimated cost of between £12,200 and £14,118 per property. Regarding Typical Retrofit Stage 3 (renewable energy generation), it was observed that while solar installations offer the most attractive

financial payback compared to fabric and low carbon heating improvements, they are not as effective in reducing whole life carbon over a 20-year period.

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Appendix 3

Why Housing Retrofit Matters for Broxtowe

Borough emission data published by the Department for Energy Security and Net Zero shows that the Borough of Broxtowe emitted approximately 392 $ktCO_2e$ in 2023 **(Figure 1),** a reduction of around 39% since 2005. Whilst transport remains the largest source of emissions at approximately 35% **(Figure 2),** domestic properties account for around 130 $ktCO_2e$ per year, representing 33% of all Borough emissions, making housing the second largest source of emissions within the Borough. This demonstrates that the way homes are heated, powered and insulated has a significant influence on the Borough's overall carbon footprint and highlights the importance of improving the energy performance of existing homes.

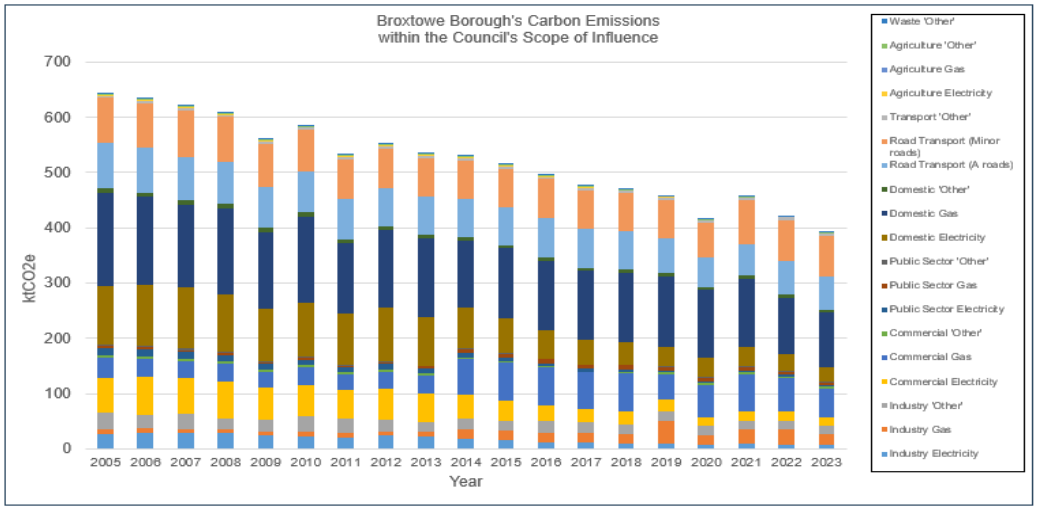


Figure 1: Broxtowe Borough's carbon emissions within the Council's scope of influence

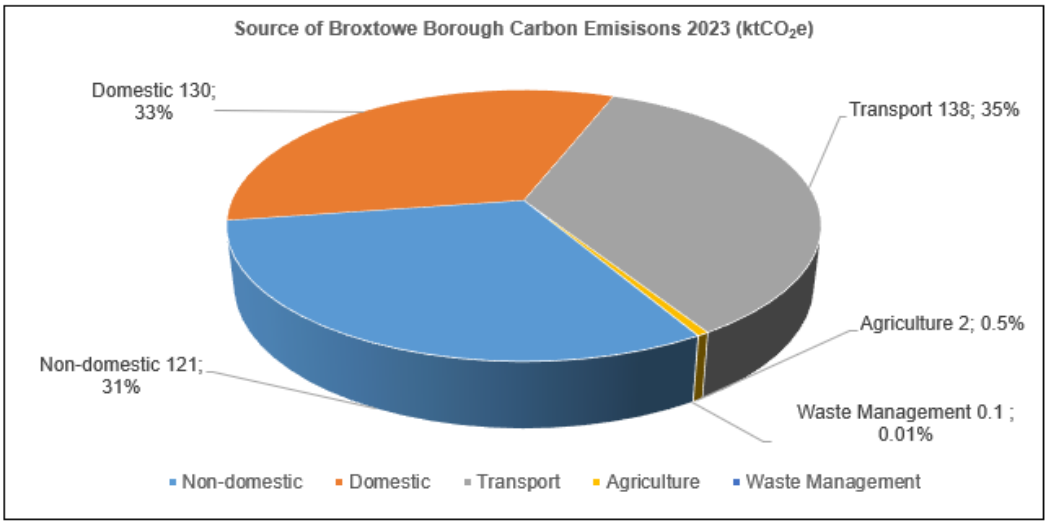


Figure 2: Source of carbon emissions for the Borough of Broxtowe 2023

Whilst new homes are increasingly being constructed to higher energy efficiency standards and are designed to incorporate low-carbon technologies from the outset, the majority of the homes that will exist in Broxtowe in 2050 have already been built. Many of these properties were constructed before modern energy efficiency standards were introduced and continue to rely on traditional heating systems and poorer performing building fabric. Improving the existing housing stock is therefore essential if the Council is to contribute towards the UK's legally binding target to achieve Net Zero carbon emissions by 2050 whilst also reducing fuel poverty, lowering household energy costs and improving residents' health and wellbeing.

University of Nottingham Housing Decarbonisation Roadmap

The University of Nottingham Housing Decarbonisation Report provides a sound evidence base for housing retrofit across the Borough. The study examined both private housing sector and the Council's own housing stock, identifying the property types most in need of intervention and assessing the costs, carbon savings and wider benefits associated with different retrofit approaches. The report concluded that a staged programme of retrofit, beginning with improvements to building fabric and followed by the installation of low-carbon heating technologies, provides the most practical and cost-effective route towards decarbonisation.

Across the wider Borough, the report identified that approximately 31,700 homes would benefit from some form of retrofit intervention. The analysis estimated that delivering a borough-wide retrofit programme, incorporating fabric improvements and low-carbon heating measures, would require investment in the region of £1.17 billion. Whilst this highlights the scale of the challenge facing the Borough's predominantly privately owned housing stock, the report concludes that such an investment could deliver significant reductions in carbon emissions, lower household energy bills and contribute towards reducing levels of fuel poverty across Broxtowe.

The report also provides a detailed assessment of the Borough's housing archetypes, recognising that different property types require different levels of retrofit investment. This information provides an important evidence base for future investment decisions, helping to identify those property types and locations where interventions can deliver the greatest benefits. It also supports the targeting of future funding opportunities and retrofit programmes towards homes where the need and potential impact are greatest.

Council Housing Stock

For the Council's housing stock, the University of Nottingham report modelled 2,929 properties, representing approximately 57% of the social housing stock at the time of the assessment. Using a traditional fabric-first methodology, combined with low-carbon heating technologies and renewable energy generation, the study estimated that a typical retrofit programme for these homes could require investment of approximately £90.6 million. This estimate included measures such as insulation improvements, air source heat pumps and solar photovoltaic systems designed to achieve significant carbon reductions and improve overall energy performance. It

should be noted that the report was completed in early 2026 and therefore reflects the EPC profile of the housing stock at that point in time. Since completion of the study, the Council has continued to undertake energy efficiency improvements and further EPC assessments across its housing portfolio, meaning that the current position may now differ from that presented within the report.

Whilst the report provides a useful indication of the scale of investment that may be required, the Council is adopting a more targeted and financially deliverable approach to improving the energy performance of its housing stock. Current government funding programmes provide support of up to £7,500 per property towards low-carbon heating installations, which across the modelled social housing stock could equate to funding of approximately £22 million, offsetting around 25% of the estimated £90.6 million investment requirement. Given ongoing funding constraints, the scale of the housing portfolio and the need to minimise disruption to tenants, the Council is developing a hybrid "fabric-light then systems" approach rather than pursuing a full deep-retrofit programme across all homes.

To support delivery, Nottingham City Council has been commissioned to undertake detailed EPC modelling across the Council's entire housing stock. This work will identify the most cost-effective route to achieving EPC Band C or above by 2030, in line with emerging national expectations for social and rented housing. The modelling will provide a property-level investment roadmap, detailed cost estimates, a phased delivery programme and information on properties where exemptions may apply (Where measures exceed the £10,000 cost cap, an exemption may be registered once all reasonable upgrades have been completed). This evidence will enable the Council to target investment towards those properties where the greatest EPC improvements can be achieved with the lowest cost and least disruption to residents

The Council's emerging retrofit strategy prioritises lower-cost, high-impact measures such as loft insulation, cavity wall insulation, heating system upgrades, solar photovoltaic panels, LED lighting and smart controls before considering more extensive interventions where necessary. Alongside the technical assessment, a prioritisation framework is being developed that considers tenant vulnerability, fuel poverty, deprivation levels, property condition and the suitability of homes for low-carbon technologies. This approach seeks to balance carbon reduction objectives with wider social outcomes, ensuring that investment is directed first towards those households most likely to benefit while maintaining progress towards achieving EPC Band C or above across the housing stock.

As part of this programme:

- 436 homes have either received or are scheduled to receive retrofit improvements between Wave 2.1 and planned programmes through 2027/28, representing over £5.2 million of investment.
- 2,606 council homes currently achieve EPC Band C or above.

- Approximately 1,700 homes are expected to be included in future retrofit investment programmes.
- The council has secured £2.59 million in external retrofit funding and investment to date.

Gedling, Broxtowe and Rushcliffe Local Area Energy Plan (LAEP)

The Local Area Energy Plan (LAEP) forms part of a wider suite of LAEPs being developed across the East Midlands under the strategic oversight of the East Midlands Combined County Authority (EMCCA). Whilst EMCCA provides the overarching framework and regional coordination, each individual LAEP remains subject to its own local governance and approval processes. The Broxtowe, Gedling and Rushcliffe LAEP is currently at draft final stage and is expected to progress to a formally adopted final version in the coming weeks, subject to agreement through the appropriate governance arrangements.

The LAEP builds on the housing evidence provided by the University of Nottingham report by taking a whole-system approach to decarbonisation. The LAEP considers not only homes, but also transport, energy generation, electricity networks, heat networks and wider infrastructure requirements. Developed through detailed digital modelling and spatial analysis, the study provides a long-term roadmap for achieving net zero across the three authorities whilst identifying investment priorities and infrastructure requirements.

The LAEP identifies that approximately 125,000 buildings across the three Boroughs require some form of retrofit intervention. The analysis demonstrates that reducing energy demand through fabric improvements is the critical first step in supporting the transition to low-carbon heating technologies and reducing overall strain on energy networks. The plan also identifies priority locations where poor energy performance, fuel poverty and other social factors coincide, enabling future programmes to be targeted towards the communities most likely to benefit from intervention. Within the Borough of Broxtowe, the report highlights:

- Eastwood Town
- Beeston Town
- Beeston North

These areas contain a higher concentration of older housing, lower energy efficiency and increased risk of fuel poverty, making them likely candidates for future external funding programmes and targeted engagement.

Importantly, the LAEP was developed using detailed neighbourhood modelling, allowing housing, energy use, emissions and infrastructure requirements to be analysed at a much more local level than Borough-wide averages alone. This provides a detailed understanding of where retrofit; fuel poverty interventions and energy infrastructure investment can deliver the greatest impact. The data has been

structured in a way that means it can continue to be used and adapted following Local Government Reorganisation, ensuring that the investment in developing the evidence base remains relevant and can continue to support strategic planning, retrofit delivery and infrastructure investment across Nottinghamshire.

Next Steps

Following completion of the governance process and formal publication of the final LAEP, the findings and recommendations will be reported back to Cabinet. This will provide Members with an opportunity to consider the finalised evidence base, its implications for future housing, energy and infrastructure planning, and how the Council can utilise the LAEP to support future funding bids, partnership working and delivery programmes.

East Midlands Combined Counties Retrofit Strategy

The East Midlands Combined Counties (EMCC) Retrofit Strategy provides the regional framework for delivering retrofit at scale across the East Midlands. Whilst the University of Nottingham report identifies what interventions are required and the LAEP identifies where they should be prioritised, the EMCC Retrofit Strategy focuses on how these ambitions can be delivered in practice.

The strategy adopts a whole-system approach to retrofit and seeks to improve energy efficiency, reduce fuel poverty, improve health outcomes and support economic growth. It recognises that successful retrofit delivery requires coordinated action across local authorities, housing providers, communities, supply chains, training providers and funding organisations. The strategy therefore focuses on six key themes: community engagement, skills and training, homes, low-carbon technologies, finance and governance.

Significantly, the strategy identifies retrofit as not only a carbon reduction measure but also a means of delivering wider social and economic benefits. These include reducing fuel poverty, improving health and wellbeing, creating skilled employment opportunities, strengthening local supply chains and supporting the development of a sustainable retrofit market. The strategy therefore provides an important delivery mechanism through which many of the recommendations arising from both the Housing Decarbonisation Report and the LAEP can be implemented.

Future Opportunities

Taken together, the University of Nottingham Housing Decarbonisation Report, the LAEP and the EMCC Retrofit Strategy provide a comprehensive evidence base for future retrofit activity across the Borough of Broxtowe. Each document serves a distinct but complementary purpose. The University of Nottingham report provides detailed housing analysis and retrofit pathways; the LAEP provides a place-based understanding of wider energy infrastructure requirements and identifies priority intervention areas; whilst the EMCC Retrofit Strategy establishes the delivery framework necessary to achieve retrofit at scale.

Collectively, these documents place the Council in a strong position to pursue future funding opportunities, target investment effectively and support residents through the transition to lower-carbon homes. They also ensure that, as Local Government Reorganisation progresses, a substantial body of evidence already exists which can continue to support strategic planning, inform future policy development and provide a robust foundation for improving housing quality, reducing fuel poverty and delivering carbon reduction benefits for residents across the Borough.

MOTT MACDONALD

Gedling, Broxtowe and Rushcliffe Local Area Energy Plan

April 2026

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Gedling, Broxtowe and Rushcliffe Local Area Energy Plan

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Executive summary

The Gedling, Broxtowe and Rushcliffe Local Area Energy Plan (LAEP) provides a comprehensive, data-driven roadmap for achieving a just, resilient, and affordable transition to net zero. Commissioned by the East Midlands Combined County Authority (EMCCA) and prepared by Mott MacDonald in partnership with IES, the plan integrates technical modelling, spatial analysis, economic appraisal, and stakeholder engagement to identify how Gedling, Broxtowe and Rushcliffe can most effectively decarbonise the local energy system while delivering wider social and economic benefits. The LAEP contributes to a joined-up regional approach that aligns local action with national policy objectives and the EMCCA's 2050 net zero ambition.

Purpose and Context

The UK has set a legally binding target to reach net zero greenhouse gas emissions by 2050. The Climate Change Committee's Seventh Carbon Budget (2025) further reinforces the urgency of local delivery by estimating that approximately 82% of the UK's emissions are within the sphere of local authority influence. Gedling, Broxtowe and Rushcliffe councils each declared a climate emergency in 2019, with all three local authorities setting targets to become carbon neutral for their internal operations and the services they deliver before 2030.

The plan responds directly to the local challenges of high fuel poverty in some areas, dependence on fossil-fuelled gas, biomass and other fuels for heating (particularly in off-gas-grid areas), grid capacity constraints, and the need for tailored approach to retrofitting heritage/listed buildings or those in conservation areas.

Approach and Methodology

The LAEP was developed using the Energy Systems Catapult (ESC) methodology for place-based energy planning. It draws on a combination of:

- Digital Twin Modelling: IES's dynamic 3D model simulating energy demand, generation, and carbon emissions across Gedling, Broxtowe and Rushcliffe's building stock at the Middle Super Output Area (MSOA) level.
- Scenario Modelling: Quantitative comparison of three distinct decarbonisation pathways — Counterfactual (Do Nothing), Net Zero by 2050, and Accelerated Net Zero by 2040 — using logistic (S-curve) uptake functions for key technologies.
- Techno-Economic Analysis: Appraisal of capital investment, operating costs, system benefits, and bill savings under each pathway.
- Spatial Prioritisation: GIS-based identification of Focus Zones for targeted interventions where energy, social, and grid considerations converge.
- Stakeholder Collaboration: Engagement with local organisations and stakeholders including Gedling, Broxtowe and Rushcliffe Councils, utilities, large industries, housing providers, and community groups.

This approach ensures that the LAEP is evidence-based, spatially specific, and co-created with those who will be instrumental in its delivery.

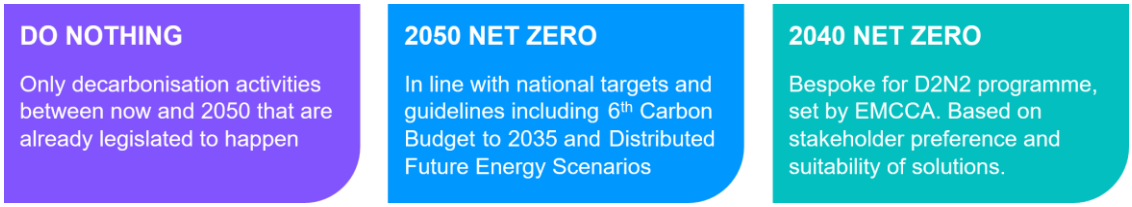
The UK government is currently undertaking a reorganisation of England's local government with the intention to establish new single-tier unitary councils in areas where two-tier systems exist, such as across Nottinghamshire and Derbyshire. If implemented, this would see "unitary authorities" assume full legal powers in April 2028. It is acknowledged that this Local Government Reorganisation (LGR) has the potential to impact how and/or who delivers the recommendations outlined in this report. However, the analysis which underpins this LAEP report was intentionally undertaken on an MSOA level such that following a potential local government reorganisation, the data can be re-shaped at the MSOA level to continue to provide an evidence-based decarbonisation pathway for Local Authorities.

Whilst the UK LGR may require reallocation of roles and responsibilities to deliver the projects specified in this LAEP report, the restructure is intended to deliver long-term simplification, stronger strategic leadership, and more effective cross-area collaboration, ultimately with the intention to quicker, more efficient delivery of projects.

Scope

The LAEP focuses on the parts of the energy system where a local authority can exert meaningful influence. This includes homes and non-domestic buildings, personal road transport and charging infrastructure, locally influenced generation such as rooftop solar, and the decarbonisation choices facing local industry that connect into local networks. Nationally controlled systems that are better addressed through central government or national operators, for example strategic rail, aviation and utility-scale electricity generation, sit outside the scope for emissions accounting and intervention planning. Maintaining this focus helps Gedling, Broxtowe and Rushcliffe concentrate resources on deliverable local actions.

The LAEP models three scenarios, with the preferred scenario for Gedling, Broxtowe and Rushcliffe being Net Zero by 2040, in alignment with each council's corporate ambitions.



Current Energy and Emissions Baseline

In 2023, Gedling, Broxtowe and Rushcliffe's total territorial emissions were approximately 1,765 $ktCO_2e$. The area's emissions profile is dominated by three key sectors: industry (17%), transport (35%), and domestic (25%).

Total energy consumption in buildings stood at 3,039 GWh, dominated by space heating (61%), followed by lighting (14%), equipment (12%) and domestic hot water (12%). Natural gas remains the dominant fuel, accounting for the majority of emissions from heating, with a smaller portion of heating supplied by electricity. For rural, off-gas-grid homes of which there are a high portion in southern Nottinghamshire and Rushcliffe specifically, oil, biomass and liquified petroleum gas (LPG) are also key fuel sources.

Energy Efficiency and Buildings Retrofit

Across Gedling, Broxtowe and Rushcliffe, approximately 125,000 buildings require some level of retrofit (either light retrofit only, deep retrofit only or both) to achieve the net zero scenarios. Modelling shows around 59,538 homes (40% of the housing stock) require light retrofit, while around 68,379 homes (46%) need deep retrofit.

Light retrofit typically offers shorter payback periods and is well-suited for rapid scaling, particularly in owner-occupied homes. In contrast, deep retrofit is essential for older, solid-wall properties to enhance the efficiency of heat pump operation and address fuel poverty hotspots. The recommended approach is to concentrate deep retrofit in a first wave of priority MSOAs where solid wall prevalence, fuel poverty and low energy performance certificate (EPC) ratings coincide.

Low-carbon Heat

Heat decarbonisation in existing homes relies primarily on-air source heat pumps (ASHPs) installed alongside targeted fabric upgrades and appropriate hot water storage. Of the identified 108,707 suitable properties, early installations should be focused in areas where electricity network capacity coincides with existing funding eligibility. In parallel, exploring the feasibility of heat networks within Eastwood and Beeston in Broxtowe, and Stoke Bardolph and Colwick in Gedling should be pursued in the identified areas and leveraging the central government zoning programme.

Transport Electrification

Across the Gedling, Broxtowe and Rushcliffe areas the modelling shows the number of electric vehicle (EV) cars rising to about 178,500 vehicles by 2040 in the preferred scenario, with a planning assumption of one public charger for roughly 20 EVs and the remainder of charging met by private and workplace provision. Siting of public chargers should begin with public car parks including through solar-carport infrastructure at council-owned buildings, and areas that lack off-street parking, then expand to workplace and destination hubs that can host rapid and ultra-rapid chargers. Heavy Goods Electric Vehicles (HGEV) as well as commercial light duty vehicle (LDV) fleet electrification needs must be considered, taking a holistic approach to supporting the decarbonisation of road transport in the region.

Local Generation and Flexibility

Expanding local renewable energy generation is key to enhancing energy resilience and managing grid load. The analysis identifies significant potential for rooftop solar photovoltaic (PV), with the capacity to generate over 270 GWh annually across domestic and non-domestic buildings. When paired with battery storage and Demand Side Response (DSR) measures, this local generation can reduce peak demand, provide flexibility to the grid, and lower consumer bills.

Industrial Decarbonisation

The plan prioritises the electrification of low-temperature industrial processes first, while high-temperature processes prepare for a potential transition to low-carbon hydrogen, contingent on the development of a credible supply chain and supporting infrastructure.

Analysis suggests that industrial gas use for process heating can be substantially reduced by 2050, with associated emissions falling by around 76% under the assumed fuel-switch scenarios. To make this achievable, large industrial sites should be encouraged to develop time-phased decarbonisation plans detailing what changes will occur, when they will occur, and what new energy vectors and network capacities will be needed. Collaboration with community energy organisations as well as local authorities is recommended to ensure that potential opportunities for residential-commercial partnerships are explored, for example, the connection of a domestic district heat network to excess heat from an industrial site.

Networks, Storage and Headroom

The plan highlights that several primary substations and MSOAs have limited spare capacity, making timely reinforcement, connection planning, and flexibility critical to keeping electrification on track. There is a strong case for proactive investment in distribution network upgrades, as any net zero compliant scenario is projected to add approximately 1500 MW of After Diversity Maximum Demand (ADMD) across Gedling, Broxtowe and Rushcliffe combined, which would exceed the capacity of the current infrastructure.

Close collaboration with the local distribution network operators (National Grid Electricity Distribution (NGED), Electricity Northwest Limited and Northern Powergrid) will be necessary to appropriately phase the scale roll-out of PV, ASHP and EVs.

Economics and Value for Money

The additional undiscounted capital expenditure for the 2040 and 2050 scenarios is estimated at £6.4 billion in today’s prices. Although the required investment is substantial and the pace of transition will depend on sustained policy and grant support, it is expected to generate benefits through lower energy bills, carbon reduction, improved air quality, and employment stimulation in the local economy.

Prioritisation and focus zones

Spatial mapping identified Focus Zones where targeted interventions deliver maximum benefit. These include areas with high fuel poverty risk, poor EPC ratings, and high grid utilisation, where the deployment of retrofit measures would be expected to reduce the strain on the electricity network whilst supporting a just transition by ensuring vulnerable groups benefit from decarbonisation efforts.

In addition, the following “Quick Win Projects” are identified:

- Retrofit of fuel-poor private housing – deploying deep and light intervention measures simultaneously with ASHPs to reduce disruption.
- Deployment of rooftop solar on public sector buildings including energy intensive leisure centres, community centres and depots.
- Rollout of public EV charging – developing local charging hubs on council-owned premises for both council fleet and public use, supplemented by on-street charging infrastructure in high-demand residential zones, particularly those with high fuel poverty levels.
- Collective purchasing agreements – facilitating the bulk procurement of solar PV for clustered community deployments or negotiating large-scale renewable power purchasing agreements could help reduce the cost of sourcing renewable energy through economies of scale.
- Education / awareness campaigns – providing a ‘one-stop-shop’ for trusted advice, guidance, applicable grant funding as well as a council-approved list of installers/specialists to support retrofits, ASHPs, solar PV and battery installations for the ‘able-to-pay’ market.

These projects draw on the availability of funding, expertise within the local and regional communities and aim to address the most pressing challenges.

Next Steps

To ensure the timely and effective delivery of the LAEP, three key actions are recommended:

1. Establish a delivery partnership to progress the actions and focus zones outlined in the LAEP, particularly focusing on the regional challenges such as heritage or listed building designations and properties located rurally / at edge of the network, which were identified in the LAEP process as key challenges.
2. Collaborate on and support the development of an EMCCA-wide LAEP hub, providing a centralised web platform for residents, businesses and other local community representatives to visit to seek advice, funding guidance or connect with local expertise / suppliers.
3. Develop a comprehensive delivery roadmap and investment plan that prioritises short-, medium-, and long-term interventions as outlined in the report.

1 Introduction

Mott MacDonald, in partnership with IES, has been appointed by the East Midlands Combined County Authority (EMCCA) and its local authority partners to lead the development of the Local Area Energy Plan (LAEP) for the areas Gedling, Broxtowe and Rushcliffe (GBR) in Nottinghamshire, supporting each area's journey toward achieving Net Zero carbon emissions. In response to escalating impacts of climate change and the global push towards sustainable energy solutions, the development of a LAEP has been identified as a crucial step in supporting climate ambitions across Derbyshire and Nottinghamshire.

This LAEP forms part of a wider regional local area energy plan commissioned by EMCCA. The East Midlands regional plan comprises of eight local area plans, of which Gedling, Broxtowe and Rushcliffe make up one. This LAEP has therefore been prepared to be comparable to the other local plans, and to contribute to the wider regional one. This report presents the outcomes of the Gedling, Broxtowe and Rushcliffe LAEP, following a comprehensive process of data acquisition, scenario modelling, stakeholder engagement and collaboration, and spatial analysis.

1.1 What is a LAEP?

A LAEP is a long-term, evidence-based plan that sets out the most effective and efficient pathway for an area to transition to a low-carbon, smart, and flexible energy system. It provides a strategic framework to coordinate investment in energy infrastructure, shape local policies, and guide decision-making across stakeholders. By aligning spatial, technical, and socio-economic considerations, LAEPs ensure that local authorities, businesses, network operators, and communities can collectively plan for a cost-effective and just transition to Net Zero.

Local authorities have a pivotal role to play in enabling the UK's net zero transition. An estimated 82% of the UK's carbon emissions fall within local authorities' scope of influence[1]. There is a growing need for place-based energy strategies that align national goals with local opportunities, priorities, and constraints.

A LAEP is a bottom-up, data-driven, whole-system approach that integrates technical evidence, stakeholder engagement, and non-technical factors to create a comprehensive net zero plan tailored to Gedling, Broxtowe and Rushcliffe's unique characteristics.

The LAEP will consider energy supply and demand, transport, buildings, local industry, and the environment. It looks at current energy use and future decarbonisation opportunities for electricity, heat, and gas networks, the built environment (industrial, domestic, and commercial), and the potential for hydrogen and other low carbon fuels. The plan will involve collaboration with various stakeholders to develop a realistic, data-driven action plan.

The primary goal of the Gedling, Broxtowe and Rushcliffe LAEP is to identify the most cost-effective ways to decarbonise each borough, aligning local plans and priorities with broader regional and national policies and strategies. It will provide a roadmap for Gedling, Broxtowe and Rushcliffe to achieve net zero emissions at the local level. Additionally, the LAEP will be coordinated alongside other areas within the wider EMCCA region to ensure a consistent and joined-up approach between Derby, Derbyshire, Nottingham, and Nottinghamshire (D2N2).

Our standardised approach delivers alignment in outputs, which will significantly increase the ability for projects across areas to scale up through similar enabling mechanisms such as training programmes, funding allocations and aligned priorities.

[1] HM Government. Net Zero Strategy: Build Back Greener. Department for Business, Energy & Industrial Strategy, October 2021. Available at GOV.UK

1.2 Geographical Boundary of the LAEP

1.2.1 Gedling

Gedling is a borough located in Nottinghamshire, England, with a population of approximately 117,000 (ONS, 2021) and covers an area of 120 km². The borough is known for its rich history and green spaces, including Gedling Country Park and Newstead Abbey. Gedling has a diverse economy, with key sectors in retail, healthcare, and education. The borough is also home to several small and medium-sized enterprises, contributing to its vibrant local economy.

1.2.2 Broxtowe

The borough of Broxtowe is also located in Nottinghamshire, England, with a population of approximately 110,900 (ONS, 2021) and covers an area of 81 km². The borough is characterized by a mix of urban and rural areas, with key towns including Beeston, Eastwood, and Kimberley. Broxtowe has a diverse economy, with significant sectors in retail, education, and healthcare. The borough is also known for its green spaces and community initiatives, contributing to a high quality of life for its residents.

Figure 1.1: Gedling, Broxtowe and Rushcliffe Geographical Boundary in relation to Nottingham City and Nottinghamshire County[2]



1.2.3 Rushcliffe

Rushcliffe is a borough located in Nottinghamshire, England, with a population of approximately 119,100 (ONS, 2021) and covers an area of 409 km². The borough is known for its vibrant communities and green spaces, including Rushcliffe Country Park and the River Trent. Rushcliffe has a diverse economy, with key sectors in retail, education, and healthcare. The borough also supports a range of small and medium-sized enterprises, contributing to its dynamic local economy.

1.3 LAEP Scope

The LAEP considers energy supply and demand, transport, buildings, local industry, and the environment. It examines current energy use and future decarbonisation opportunities for electricity, heat, and gas networks, the built environment (industrial, domestic, and commercial), and the potential for hydrogen and other low-carbon fuels. The plan involves collaboration with various stakeholders to develop a realistic, data-driven action plan.

[22] Nottinghamshire County Council - Development Planning

Table 1.1: LAEP Scope

Energy Source	Description
Buildings	Identifying priority areas for retrofitting of domestic homes and public buildings to improve energy efficiency Identifying priority areas for heat pump installation or other low-carbon heating. Identifying opportunities for the installation of rooftop solar panels and low-carbon, flexible energy technologies, such as batteries, to reduce demand at peak times
Transport	Identifying priority locations for the installation of electric vehicle (EV) charge points based on projected EV use, particularly around dwellings without off-street parking.
Energy Generation	Reflecting local identification of sites for large-scale, low-carbon energy developments such as utility-scale solar, and district heat networks. Providing information for electricity distribution network operators (DNOs) to ensure the electricity network can handle expected extra capacity and grid connections.
Local industry	Understanding energy requirements and decarbonisation options for local industry.

1.4 Emission Boundary

The LAEP is focused on areas where local authorities can exert meaningful influence, including buildings, private transport, local energy generation and industrial emissions within the distribution network footprint.

While the Gedling, Broxtowe and Rushcliffe LAEP provides a strategic framework for guiding the area's transition to net zero, it is essential to define the boundaries of its scope. In line with the Energy Systems Catapult LAEP methodology and the practical remit of local authorities, the areas set out in Table 1.2 are considered out of scope for emissions accounting and intervention planning.

Table 1.2: Emissions Scope Exclusions

Emission Source	Justification
National and Strategic Transport Infrastructure	Emissions from vehicles transiting through Gedling, Broxtowe and Rushcliffe on national motorways are excluded as these journeys are not locally generated and fall outside the remit of local transport planning.
Rail electrification	Emissions from diesel-powered rail services and the potential electrification of rail infrastructure are excluded, as these are governed by national transport policy and infrastructure investment decisions.
Aviation	Emissions from domestic and international aviation are excluded, as flight operations and airport infrastructure are governed by national and international regulatory frameworks beyond local authority control.
Large-scale energy generation	Emissions from large-scale distributed generation, where output is exported to the national grid rather than consumed locally, have been excluded from this analysis, as these assets contribute to national energy supply and their associated emissions are already captured within the carbon intensity factors used for electricity consumption. The LAEP focuses on distribution-connected and locally influenced generation, such as rooftop solar and community-scale renewables.
Land use change and peatland emissions	Although significant in the regional carbon balance, emissions from land use change and peatland degradation are excluded. These are typically addressed through broader land management and agricultural strategies.
Agricultural emissions	Emissions from agricultural activities, including methane and nitrous oxide from livestock and fertiliser use, are excluded due to limited local authority control and the need for sector-specific national strategies.

Embodied emissions from construction	Embodied emissions (sometimes referred to as capital carbon) includes the emissions emitted in fabricating goods (construction or consumer goods), transporting them to their point of use, and in the case of construction the emissions emitted during construction. These emissions, and any interventions to reduce them, are excluded from the LAEP.

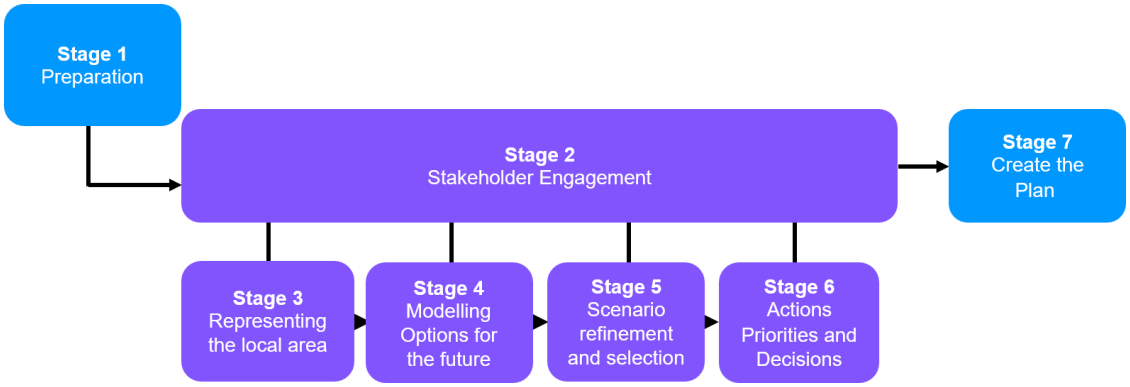
Note: other exclusions may exist, which will be presented in the technology intervention areas, and associated appendices.

These exclusions reflect the standard practice in LAEP development, which typically omits non-energy sources of greenhouse gas emissions and aspects of the energy system expected to be overseen through national infrastructure by central government. This approach supports targeted, actionable planning while maintaining alignment with national decarbonisation strategies.

1.5 LAEP Structure

This plan is structured into themed chapters that enable stakeholders to quickly locate and engage with the information most relevant to their interests and responsibilities. It is designed to be both comprehensive and accessible, supporting a wide range of users in understanding and applying the evidence-based roadmap for GBR's target to reach net zero. This LAEP will be modelling specifically identified net zero scenarios in order to align with the broader D2N2 regional LAEP, but the preferred scenario drawn out in this report is to achieve Net Zero by 2040 across all three local authorities.

Figure 1.2: LAEP Summary Approach



2 Policy Context

2.1 National Policies

2.1.1 Overview of National Climate Targets and Strategic Direction

The UK's climate policy is anchored in the UK Climate Change Act 2008[3], as amended in 2019 to set a legally binding target of net zero greenhouse gas emissions by 2050. Interim targets include a 68% reduction by 2030 and 78% by 2035, compared to 1990 levels. These targets are territorial, excluding emissions embedded in imports. The Net Zero Strategy: Build Back Greener outlines sector-wide decarbonisation, with a key emphasis on clean electricity by 2035 and recognition that 82% of emissions fall within local authority influence, making LAEPs a critical delivery mechanism.

In 2024, the Climate Change Committee (CCC) updated its recommendations to accelerate progress toward the 2030 target[4]. These include tripling offshore wind, doubling onshore wind, and increasing solar capacity fivefold. The CCC also called for 10% of UK homes to be heated by heat pumps and for nearly all new cars sold to be electric by 2030. These recommendations are reinforced by the Seventh Carbon Budget (2025), which proposes a cap of 535 $MtCO_2e$ for 2038–2042 and an 87% emissions reduction by 2040. Sector-specific targets include an 86% reduction in surface transport emissions and major contributions from electrification and land use change.

2.1.2 Energy Infrastructure, Market Reform and Planning Policies

The UK Government has introduced several legislative and strategic reforms to modernise energy infrastructure and accelerate clean power deployment. The Great British Energy Act (2025), [5]establishes Great British Energy (GBE), a publicly owned company tasked with investing in and operating low-carbon energy infrastructure. Backed by £8.3 billion in public capital, GBE will co-invest with the private sector, support community energy schemes, and help deliver the government's target of a fully clean electricity system by 2030.

The proposed Energy Independence Act aims to phase out new oil and gas exploration licences, improve home energy efficiency, and expand support for insulation and low-carbon heating. Ofgem has approved a £24 billion investment programme to upgrade electricity and gas networks, expand grid capacity to connect 126 GW of clean power by 2030, and deploy flexible technologies such as storage and smart grids. The Clean Power Action Plan (2024) sets regional caps for solar and battery storage, including 2.1 GW of transmission-connected solar PV and 500 MW of battery storage in Central England, guiding local connection priorities.

To support delivery, the 2025 Planning and Infrastructure Bill[6] proposes reforms to streamline consenting for critical infrastructure, introduce strategic nature recovery mechanisms, and enable cross-boundary spatial planning. Ofgem's Connections Reform replaces the "first come, first served" grid queue with a strategic prioritisation process, favouring projects with planning progress and alignment to national decarbonisation pathways. This may affect the sequencing and viability of local solar and storage projects.

[3] The Climate Change Act 2008 (2050 Target Amendment) Order 2019

[4] Progress in reducing emissions 2024 Report to Parliament - Climate Change Committee

[5] UK Government, *Great British Energy Act 2025* (The Stationery Office, 2025)

[6] UK Government, *Guide to the Planning and Infrastructure Bill* (Department for Levelling Up, Housing & Communities, 2025)

2.1.3 Buildings, Heat and Local Delivery Mechanisms Policies

Buildings account for around 25% of UK emissions, making them a key focus of decarbonisation efforts. The 2021 Heat and Buildings Strategy[7] sets out plans to phase out new gas boilers by 2035, scale heat pump installations to 600,000 per year by 2028, and ensure all new buildings are net zero-ready. The 2025 Future Homes and Buildings Standard [8] will require all new homes and non-domestic buildings to be built to high energy efficiency standards, with low-carbon heating systems and improved ventilation. Homes built under the new standard are expected to produce 75–80% fewer emissions than those built under current regulations.

The 2025 Warm Homes Plan[9] complements these efforts by targeting fuel poverty, aiming to lift over one million households out of fuel poverty by 2030 while accelerating the shift to clean, homegrown energy. Together, these policies provide a robust framework for local authorities to deliver decarbonisation through LAEPs, with clear national targets, funding mechanisms, infrastructure upgrades, and building standards to support local action.

2.1.4 Transport and Industrial Strategy Policies

The Integrated National Transport Strategy[10] develops a unified vision for England's transport system, aiming to improve integration across modes, support decarbonisation, and enhance accessibility. It promotes the use of data and technology to improve journey planning and system efficiency and will guide transport policy and investment decisions over the next decade.

A pre-existing UK Transport Decarbonisation Plan[11] outlines measures to achieve net zero transport emissions by 2050. Key actions include ending the sale of new petrol and diesel cars by 2030, requiring all new cars and vans to be zero-emission by 2035, and investing in public transport, walking, cycling, and sustainable aviation and maritime fuels. Supporting infrastructure includes EV charging points and hydrogen refuelling stations. Recent updates include the Zero Emission Vehicle mandate and Sustainable Aviation Fuel mandate from 2025.

The UK's Modern Industrial Strategy[12] provides long-term policy certainty for high-growth sectors, including clean energy industries. It supports investment in regional clusters, supply chain development, and skills for the energy transition. The Clean Energy Industries Sector Plan, part of the strategy, is particularly relevant to LAEPs, focusing on enabling local delivery of low-carbon infrastructure and workforce development.

2.2 Regional Policies

2.2.1 East Midlands Combined County Authority Ambition for Greener Environment

The East Midlands Combined County Authority (EMCCA)[13] has set ambitious goals to create a greener, more sustainable environment. In alignment with national targets, the EMCCA aims to be carbon neutral by 2050. To realise this ambition, some of opportunities have been identified which include building new low carbon homes, retrofitting existing home, promoting renewable energy, protecting, and enhancing green spaces, exploring the establishment of heat network zoning to decarbonise heating and hot water, and potentially increasing the region's electricity network capacity.

[7] HM Government, *Heat and Buildings Strategy* (Department for Business, Energy & Industrial Strategy, 2021)

[8] HM Government, *The Future Homes and Buildings Standards: 2023 Consultation* (Department for Levelling Up, Housing & Communities, 2023)

[9] HM Government, *Help to Save Households Money and Deliver Cleaner Heat to Homes* (Department for Energy Security and Net Zero, 2025)

[10] Integrated National Transport Strategy for England

[11] Transport decarbonisation plan

[12] The UK's Modern Industrial Strategy 2025 - GOV.UK

[13] East Midlands Combined County Authority, *Corporate Plan 2025–26* (EMCCA, 2025)

2.2.2 D2N2 LEP Energy Strategy

The D2N2 Local Enterprise Partnership [14](covering Gedling, Broxtowe and Rushcliffe, Nottingham, Nottinghamshire and Derbyshire) set out a regional energy strategy for 2019-2030 to support economic growth while reducing carbon emissions. It targets a 60% reduction in emissions from 1990 levels, with ambitions for 100% low-carbon energy supply, of which 60% should come from renewables. The strategy also promotes smart transport, aiming for 70% of vehicle miles to be ultra-low emission, and supports community energy generation with a goal of 15 MW installed capacity. It encourages upgrading buildings to EPC C or above, expanding electricity storage by 180 MW, and investing in energy efficiency to reduce regional energy bills by over £1 billion annually.

2.2.3 Nottinghamshire County Council Carbon Reduction Plan

The Nottinghamshire County Council Carbon Reduction Plan[15] provides a roadmap of how the area of Nottinghamshire County will reduce its carbon missions to become carbon neutral by 2030. It sets out a framework for action and scope for the activities for which greenhouse gas (GHG) emissions will be measured and reported in pursuit of the 2030 goal. The scope of the emissions is limited to activities related to energy use in buildings, highways assets (mainly street lighting), and work-related travel and transport.

2.2.4 The Nottinghamshire Plan

The Nottinghamshire Plan [16]covering the period from 2021 to 2031, sets out the long-term vision of creating a healthy, prosperous and green future for all residents. The key objectives focus on bringing improvements to health, wellbeing and living standards as well as growing the economy while achieving net zero carbon targets by 2030 through

- Reducing emissions across transport fleets, properties and highways
- Support and improve biodiversity
- Reduce waste and increase recycling
- Improve air quality
- Promote greener travel

2.2.5 Nottinghamshire's Electric Vehicle (EV) Charge Point Framework

The Nottinghamshire EV Strategy [17]sets out a clear vision and approach to expanding EV infrastructure by developing a comprehensive, accessible, and future-ready charging infrastructure across the county. It supports Nottinghamshire's broader climate goals by aiming to reduce transport-related emissions and improve air quality. The strategy focuses on equitable access, ensuring that both urban and rural communities—especially those without off-street parking—can benefit from the shift to electric vehicles. It also emphasises collaboration with local authorities and private partners to deliver infrastructure that meets current and future demand.

2.2.6 EMCCA Corporate Plan 2025-26

With EMCCA in its early years of operation, significant long-term policy is still in development. However, EMCCA have produced a Corporate Plan for 2025-26, which sets out several commitments on the net zero transition and climate resilience. These include developing a strategic vision and investment plan for clean energy across the EMCCA region, supporting investment in green industry,

[14] D2N2 Local Enterprise Partnership, *D2N2 Energy Strategy 2019–2030* (D2N2 LEP, 2019)

[15] Nottinghamshire County Council, *Carbon Reduction Plan 2022–2032* (Nottinghamshire County Council, 2022)

[16] Nottinghamshire County Council, *The Nottinghamshire Plan: Our Plan for a Healthy, Prosperous and Greener Nottinghamshire 2021–2031* (Nottinghamshire County Council, 2021)

[17] Nottinghamshire County Council, *Electric Vehicle Charging Frameworks and Strategies* (Nottinghamshire County Council, 2025)

energy efficiency and low-carbon energy generation, leveraging the region's leading position in fusion, advanced nuclear and hydrogen industries, and establishing a nature and biodiversity taskforce.

2.2.7 East Midlands Local Retrofit Strategy

The East Midlands Local Retrofit Strategy (2025–2028)[18] sets out a coordinated regional plan to accelerate domestic energy-efficiency upgrades and low-carbon home improvements. Improving the energy efficiency of homes, reducing fuel poverty, and cutting carbon emissions by accelerating high quality retrofit delivery across the region. Developed with contributions from more than fifty organisations, it promotes a whole system model that brings together communities, skills, supply chains, finance, and governance to create warmer and healthier homes while supporting local jobs and economic growth. The strategy positions retrofit as both a climate priority and a significant social and economic opportunity for the East Midlands.

2.3 Local Policies

2.3.1 Gedling Borough Council Carbon Management Strategy

Gedling Borough Council declared a climate emergency in 2019 and set an ambitious target of achieving net zero carbon emissions by 2030. The council published its Carbon Management Strategy (2021 – 2030[19]) outlining the actions the Council will take to reduce its carbon emissions in response to the climate emergency. This was updated in 2025[20] to include the following targets:

- Consider the inclusion of local energy efficiency standards through Gedling's Local Development Plan.
- Maximise available funding (through EMCCA & other sources) promote schemes to help retrofit housing within the borough, by raising EPC standards to a minimum of a C or above.
- Further develop a strategy for EV charging points across Gedling owned car parks and explore external funding opportunities.
- Identify and work with key influencers/partners in the borough, such as the climate change groups, D2N2 LEAP to promote the climate change agenda.
- Delivery of Biodiversity Net Gain for new developments by at least 10%.

2.3.2 Broxtowe Borough Council Climate Change and Green Futures Strategy

In 2019, Broxtowe Borough Council declared a climate emergency and committed to becoming carbon neutral by 2027[21] and net zero beyond this. The council published this strategy to highlight key areas where stakeholders can work together to drive positive change, as well as setting out some important context in policy and emission data.

Within the strategy, the Council has pledged the following:

- Reduce its carbon emissions year on year as much as possible.
- Engage with all stakeholders on issues regarding climate change at every opportunity.
- Refresh the Climate Change and Green Futures Strategy and Carbon Management Action Plan regularly to ensure it remains relevant, up-to-date and fit for purpose.
- Review projects and approve investment based on a cost to benefit rationale.
- Look to work with external partners to seek investment, funding and professional advice.

[18] East-Midlands-Local-Retrofit-Strategy-summary.pdf

[19] Gedling Borough Council, *Carbon Management Strategy 2021 to 2030* (Gedling Borough Council, 2021)

[20] Gedling carbon management actions - 2025-26 Update

[21] Broxtowe Borough Council, *Carbon Neutral by 2027: Climate Change and Green Futures Strategy* (Broxtowe Borough Council, Updated 2024)

2.3.3 Rushcliffe Borough Council Climate Change Strategy

In 2020, Rushcliffe Borough Council made a commitment to work towards becoming carbon neutral by 2030[22] for its own operations. The Council is also committed to supporting local residents and businesses reduce their own carbon footprint. The strategy highlights the three key areas of focus for the council:

- Reducing the emissions associated with buildings and activities
- Supporting residents and businesses to reduce their emissions
- Protecting and increasing green spaces and their ability to absorb CO_2

[22] Rushcliffe Borough Council, *Carbon Neutral 2030 – Council Strategy* (Rushcliffe Borough Council, 2020)

3 Current Emissions and Energy Use

This section presents an overview of the existing emissions and energy across the three LAEP local authorities, Gedling, Broxtowe and Rushcliffe with the intent of outlining the emissions and energy baseline for this LAEP.

3.1 The Energy Baseline Definition

The Local Area Energy Plan (LAEP) energy baseline for each local authority is a simulation of energy supply and demand across all buildings within each borough's boundaries for the year 2022. It includes both domestic and non-domestic buildings, although confidence in the input data for non-domestic buildings is lower, and emissions from industrial activities beyond gas consumption are not available at this stage.

The baseline covers approximately 147,000 buildings, each with a rich set of attributes. Simulated energy consumption and associated carbon emissions are available at annual and monthly granularity, and can be broken down by heating, domestic hot water (DHW), and electrical loads (including lighting, auxiliary loads and equipment). These results can be aggregated at Middle Super Output Area (MSOA) and Local Authority levels and are accessible via the IES 3D digital map, which visualises all buildings and energy assets across each local authority area.

A Middle-layer Super Output Area (MSOA) is a medium-sized statistical geography used in England and Wales, sitting between Lower-later Super Output Areas (LSOAs) and Local Authorities. Each MSOA contains around 5,000-15,000 residents or 2,000-6,000 households.

3.2 Creation of the Energy Baseline

Each local authority's baseline was developed using IES' Digital Twin software, which integrates geographic information system (GIS) and building data to simulate energy use and carbon emissions across the building stock. The key datasets utilised are set out below.

- **The Ordnance Survey National Geographic Database** (OS NGD) Buildings dataset was used to generate 2D building geometries.
- **Energy Saving Trust's Home Analytics** datasets for domestic and non-domestic buildings provided information on building characteristics such as fabric, heating systems, and fuel types.

These datasets include energy performance certificate (EPC) data and predictive modelling for homes without EPCs. For non-domestic buildings, data availability is more limited, restricting the scope of analysis for interventions such as fabric improvements. Where data gaps exist, assumptions are made to enable all buildings to be included in the analysis. A list of attributes available from Energy Savings Trust data for domestic and non-domestic buildings is included in Annex A.

A baseline energy profile is created using IES' technology, resulting in a dynamic 3D digital map of the area, as well as industrial process load data from Cadent Gas. The modelling is organised by MSOAs, with each MSOA containing around 5,000 buildings. These zones represent the smallest geographical units with sufficient government energy data (electricity and gas) for comparison, and each has its own masterplan-scale energy model.

3.3 Current Emissions and Energy Use

The total amount of emissions attributed to Gedling, Broxtowe and Rushcliffe is 1,765 ktCO2e, based on UK Government data for 2023[18].

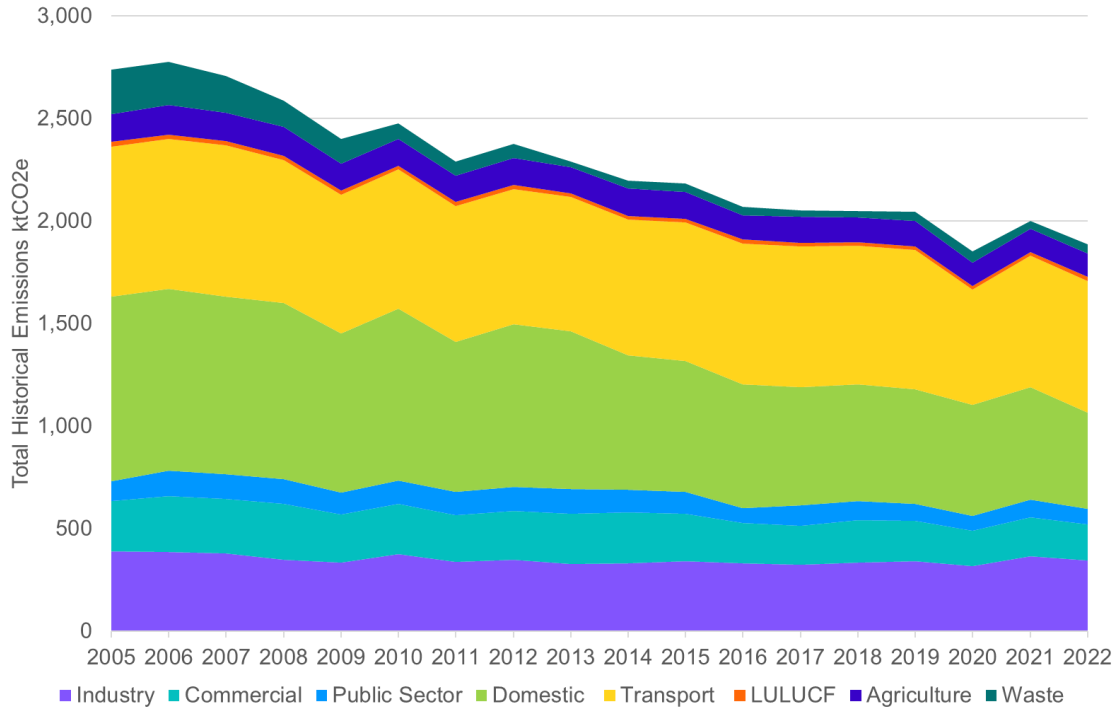
Figure 3.1 illustrates the historical emissions of Gedling, Broxtowe and Rushcliffe from 2005 to 2023, split by sector. Over this period, each area has experienced a combined gradual reduction in

carbon emissions across industry, transport, domestic and commercial properties, and waste. This reduction in emissions is largely driven by the decarbonisation of the national electricity grid.

Transport remains the largest emissions contributor, accounting for 34% of total emissions, followed by industry at 18%, the commercial sector at 10%, The public sector represented a smaller share at 4%, reflecting emissions from public buildings and services, agriculture at 6%, and waste-related emissions made up 2%, while land use, land-use change and forestry (LULUCF) accounted for the remaining 1%. The LAEP scope includes emissions from industry, commerce, public, and domestic sectors, targeting **57%** of Gedling, Broxtowe and Rushcliffe's total carbon emissions.

This targeted scope ensures that the LAEP focuses on the most significant local emission sources and supports the development of effective, evidence-based decarbonisation strategies.

Figure 3.1: Historical emissions of Gedling, Broxtowe and Rushcliffe from 2005 to 2023, split by sector



Source: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-greenhouse-gas-emissions-statistics-2005-to-2023

Please note that a breakdown of historic carbon emissions and building energy use according to local authority can be found in Appendix F.

Figure 3.2: Gedling, Broxtowe and Rushcliffe emissions breakdown in 2023, split by sector

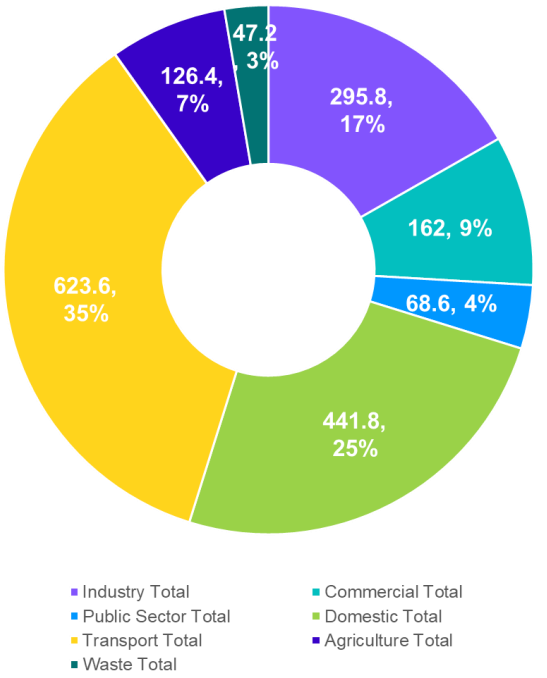
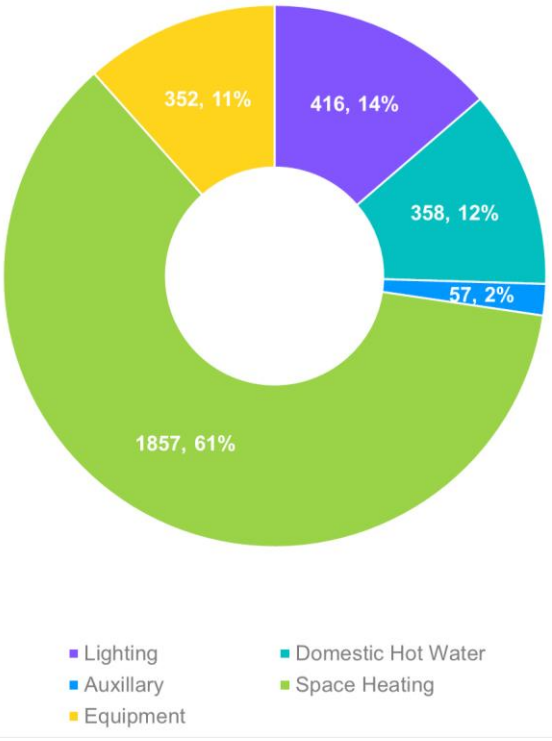


Figure 3.3: Gedling, Broxtowe and Rushcliffe Average Buildings Use Energy Breakdown (GWh)



Total building energy demand in Gedling, Broxtowe and Rushcliffe totalled 3,039 GWh in 2023, with energy demand slightly higher in Rushcliffe due to its higher concentration of rural areas and older, less efficient building archetypes. However, the proportionality of energy consumption end use is similar across all local authorities. Space heating was the dominant energy use at 61%, followed by lighting (14%), equipment (11%), domestic hot water (12%) and then auxiliary systems (2%). These figures highlight the significant role of heating and equipment in overall energy consumption, pointing to key opportunities for targeted efficiency and decarbonisation interventions.

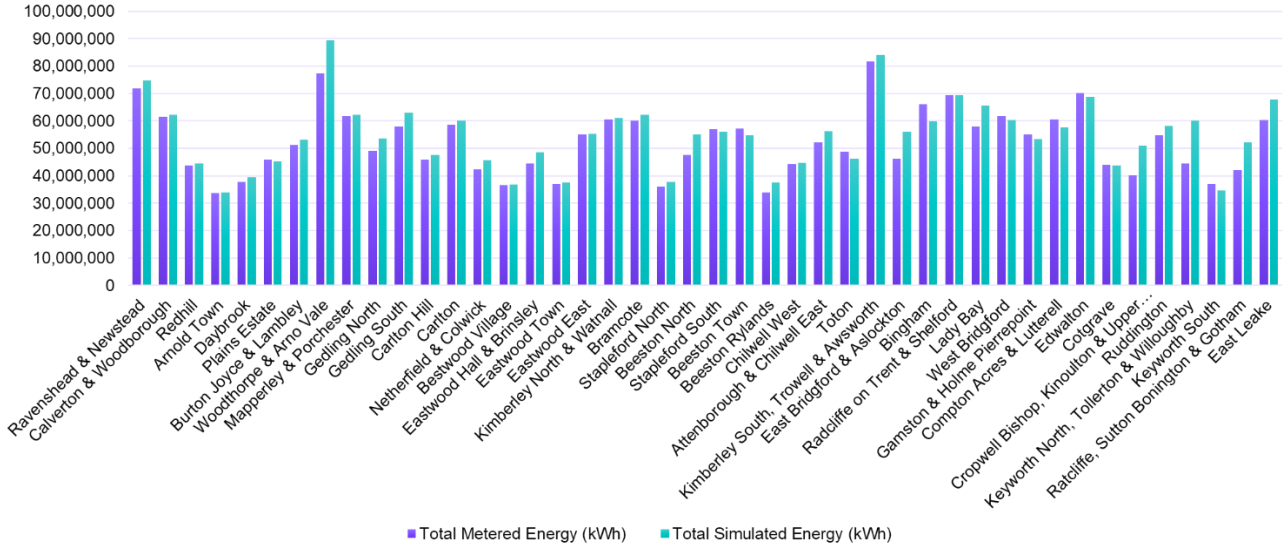
The split between the different sectors is generally consistent between districts. However, emissions in Broxtowe are strongly driven by Transport, with these emissions accounting for nearly half of the areas total emissions. This is likely due to the dense population as well as proximity to the Nottingham city. The split between industrial, commercial and domestic sectors differs slightly between districts, and most notably industrial emissions in Rushcliffe are higher than the other areas, with Ratcliffe-on-Soar making way for the East Midlands Freeport. In Gedling, emissions arise from a much broader range of sectors, with the transport and domestic sectors dominant, whilst the presence of agricultural operations in Rushcliffe contributes to the combined area's emissions, but Gedling and Broxtowe show minimal emissions in this sector.

3.4 Energy Baseline Validation

Data from the Energy Savings Trust was utilised to model energy use in the Digital Twin, and results from the Digital Twin were validated against UK Government data which includes only electricity and gas metered consumption. In terms of data accuracy, this means fuels such as oil, LPG, and biomass are excluded, leading to less representative results in rural areas where these fuels are more commonly used. This is not anticipated to be material in the case of Gedling, Broxtowe and Rushcliffe.

Below are the energy simulation results for electricity and gas consumption compared to government data at MSOA level for Gedling, Broxtowe and Rushcliffe's domestic buildings.

Figure 3.4: Energy simulation results for electricity and gas consumption compared to government data at MSOA level



For both domestic and non-domestic buildings, a floor area correction was applied. This adjustment accounts for the simulation software's assumption that the entire building footprint is thermally conditioned, including spaces such as cupboards, internal voids, and wall thickness. Where high-confidence conditioned floor area values were available from the Energy Saving Trust, these were compared to modelled areas to derive scaling factors used across the building stock.

To enable a like-for-like comparison, oil, LPG, and biomass consumption were removed from the simulation results, aligning with the scope of the government dataset. Given the limitations of the available data, the results are considered acceptable. A tolerance range of ±20% was set, and all MSOA results fall within this range. Detailed results of the validation for each MSOA are available in Annex D IES Baseline Validation by MSOA.

4 Stakeholder Engagement

Stakeholder engagement has been the foundation for the overall progress of the project, with frequent interaction with stakeholders undertaken at every stage. A diverse set of stakeholders have been engaged, from commercial and community backgrounds, which enabled efficient review and feedback at different points of the project.

4.1 Engagement Objectives

Stakeholder engagement provided the project team with feedback which informed the preferred pathway chosen for this LAEP. Stakeholders assisted in developing a sequenced plan of proposed actions for achieving Gedling, Broxtowe and Rushcliffe's net zero goals.

The original stakeholder engagement aims tied into the wider LAEP programme are:

- Identify the critical stakeholders needed to deliver the priority projects.
- Increase stakeholders' understanding of energy systems and the LAEP process.
- Develop stakeholder trust and buy-in to proposals of the LAEP.
- Encourage a wide range of views and insights to refine the LAEP, identifying opportunities and constraints that will improve the deliverability.
- Increase stakeholders' understanding and the LAEP process and how it feeds into the net zero targets of Gedling, Broxtowe and Rushcliffe Councils.
- Establish a sound foundation for effective and sustained local action to reduce carbon emissions in line with each borough's climate targets.

4.2 Stakeholder Mapping

A desk-based stakeholder mapping exercise was undertaken, to produce a register of names and contact details for each area. These included Group 1, Primary and Secondary stakeholders. This created the stakeholder register, with contact details and a tracker for all touchpoint contacts held in a secure SharePoint site. Further stakeholders were added to the register as relevant throughout the course of the project.

4.3 Stakeholder Management

The interest and position of stakeholders relevant to the project was considered throughout and informed the appropriate methods of communication with each stakeholder group, whether through group stakeholder engagement sessions or organising 1:1 calls or discussions where appropriate. The grouping of stakeholders into the following categories ensured that each stakeholder group received tailored engagement and information regarding the scheme and its proposals. Definitions of each of the stakeholder groups is provided in the table below.

Table 4.1: Stakeholder Prioritisation

Category	Influence	Interest	Ranking
Steering Group	High	High	High
Primary Stakeholders	High	Medium	High
Group 1 Stakeholders	High	Medium	High

Steering Group (SG)

A small group of individuals who represent the local authorities, working closely with the project team to advise on engagement, decision making and assist with further stakeholder mapping, along with EMCCA, Mott MacDonald and IES.

Group 1 Stakeholders (G1)

These stakeholders were categorised due to their influence over all LAEP's included in the D2N2 programme, primarily network operations and the universities. These stakeholders were engaged separately at programme level. Meetings consisted of one-to-one sessions which were held with Cadent Gas and National Grid Electricity Distribution on what data could feed into the digital twin, and energy modelling analysis.

Group 2: Primary Stakeholders (PS)

Primary stakeholders were directly involved in the LAEP process and had significant influence over its outcomes. They provided local insights, priorities, and data inputs, shaping the content and direction of the LAEP, including modelled scenarios and optimised pathways. These stakeholders included key council representatives, and relevant community groups.

Group 2: Secondary Stakeholders (SS)

Secondary stakeholders were not directly involved in the LAEP's core activities. They provided local insights, priorities, and data inputs. These stakeholders included large industry and/or commercial organisations such as the NHS, utility providers, and residents' groups. Primary and secondary stakeholders were invited to workshops at key stages of the development process. Insights gathered at stakeholder meetings were fed to the project team and IES to influence the modelling. Table 4.2 summarises the stakeholders engaged throughout the LAEP development process.

Table 4.2: Summary Stakeholder Register

Stakeholder Category	**Organisations Engaged**
Steering Group	Gedling, Broxtowe and Rushcliffe Councils' Climate Change leads, D2N2/EMCCA representatives, Mott MacDonald, IES
Group 1 Stakeholders	National Grid, Cadent Gas, Local NHS boards, Nottinghamshire and Derbyshire County Councils

Primary and Secondary Stakeholders	• Employees from other teams within Gedling, Broxtowe and Rushcliffe councils • Local residents and resident groups • Local government organisations • Large industry commercial organisations (Boots, Saint Gobain, Warburtons) • Community energy organisations • Net-zero hub/local enterprise partnership (LEP) • Social housing providers and local council housing teams (Places for People, Uniper, EMH Homes) • Local organisations with energy/decarbonisation expertise (University of Nottingham) • Utility Providers (Severn Trent) • Local planners and developers • Public sector estates organisation

4.4 Stakeholder Engagements

The engagement process was designed to be iterative and two-way. Insights gathered during stakeholder meetings were fed back into the project team, and any resulting changes or refinements to the LAEP were communicated transparently to contributors. This feedback loop fostered trust, built consensus, and encouraged stakeholders to become advocates for the plan.

The Steering Group met fortnightly throughout the project, to steer the day-to-day work of the delivery team and shape other stakeholder engagements.

Group 1 stakeholder engagement consisted of one-to-one sessions which were held with Cadent Gas, National Grid and UK Power Network on what data is available that could feed into the digital twin, and energy modelling analysis.

Group 2 stakeholders were invited to workshops and stakeholder engagement sessions, taking place aligned with the relevant LAEP Stage. Group 2 stakeholders were further categorised into priority and non-priority groups as identified by the steering group, in order to target their engagement in all future sessions and workshops, to streamline the outputs received and appropriately manage our time spent with the most relevant Group 2 stakeholders.

Insights gathered at stakeholder meetings were shared and discussed amongst the wider EMCCA LAEP delivery team and agreed inputs were reflected into the energy modelling or intervention modelling, with changes then made as a result.

This commits Mott MacDonald and IES to meaningful, genuine stakeholder engagement, ensuring our stakeholders are heard and will likely continue to be engaged beyond the publication of this LAEP. Additional engagement was sought from using MS forms to expand on discussions taking place during the stakeholder engagement sessions and allowed participants to re-summarise their points in writing, or the opportunity to offer more detailed and written answers to specific topics discussed such as intervention proposals and scenarios.

Table 4.3: Key Stakeholder Engagements

Communication Channel	Frequency	Description
Workshops	Bi-monthly	Virtual and/or in person. Working with Primary, Group 1 and Secondary stakeholders to gather insights on the LAEP and help refine future plans and discuss interventions and priorities both in groups and on 1:1 basis. Comprised of a presentation of data or information, followed by specific questions to stakeholders to inform the next phase of work. Stakeholders were given the opportunity to ask questions with regards to the information presented. Other tools, such as MS Form surveys or polls, were used for additional input where relevant.
Written communications	Monthly	Written article and poster contributions for local area magazines, news outlets and community events. Contributions include submissions to the Gedling Contacts' Magazine, the Gedling Parish Council Forum and the Green Growth business events, with adapted language to enable local communities and stakeholders understand what a LAEP is. A QR code was included which linked more extensive information and/or a MS form questionnaire which enabled stakeholders to directly submit feedback and engage further.
Industry events	Ad-hoc	In person. External engagements at key regional industry events to gather specific perspectives and insights. Examples include; 1. East Midlands Hydrogen Summit - 8 November 2024 - Members of the Mott MacDonald and IES team presented to local industrial stakeholders on the LAEP process and discussed opportunities to represent hydrogen plans of local industry within the LAEP. This summit was the landmark event in the East Midlands Hydrogen calendar, where the hydrogen vision and ecosystem for the East Midlands took centre stage, with presentations from local business, local government, and workshops for delegates on a variety of topics around hydrogen. 2. Fast Followers Community Group Event - 7 February 2025 - A representative of the Mott MacDonald team presented to local community groups on the LAEP process and discussed opportunities for community energy groups and other interested parties to participate in area-specific LAEP stakeholder engagement. A number of stakeholders were registered with the programme to be added to specific LAEP stakeholder lists. The free-to-attend event was open to all community groups and other interested parties across the region

		and focussed on building knowledge, understanding and capacity across communities and community groups to tackle climate change and the wider sustainability agenda.
Direct Interaction – Email	Briefing information ahead of workshops.	Emailing to prepare stakeholders for the workshops by providing aims and objectives of the session, as well as key themes to encourage streamlined sessions. Allowing for two-way engagement if any questions arise. Email communication allowed people to contact Mott MacDonald and the Steering Group with any ad-hoc requirements or feedback.

4.5 Key Stakeholder Insights

Table 4.4: Key Stakeholder Insights for Gedling, Broxtowe and Rushcliffe

Stakeholder	Insight
Heat Network developer	Understanding Gedling, Broxtowe and Rushcliffe's district heating capabilities and potential funding streams which we would otherwise not be aware of such as the Warm Homes Plan which can support enabling measures and connection costs. It was noted there was potential in the region for smaller communal heat systems and that the Green Heat Network Fund could be used for funding these.
Utility provider	Specific data and industry inputs were provided directly which fed back to IES for their data validation.
Hydrogen network representative	Support offered to engage industry partners. This engagement was used to support the LAEP and wider consideration of hydrogen uptake.
University	Sharing their research into approach to tackling their buildings and housing stock offered useful insights for localised and bespoke approaches for retrofit.
Local manufacturer	Understanding their carbon neutral by 2030 target progress and their view for hydrogen forming part of the regional solution was a useful insight to local feasibility. Additional understanding of existing low carbon technologies such as combined heat and power (CHP) engines and biomethane supported our understanding of which high-energy non-domestic consumers could be heat network or heat pump ready.
Local authorities	Critical understanding of their support of heat network connections, where the successes have lied with social housing retrofit if health benefits and fuel poverty reductions can be achieved.

5 Assessing Options for the Future

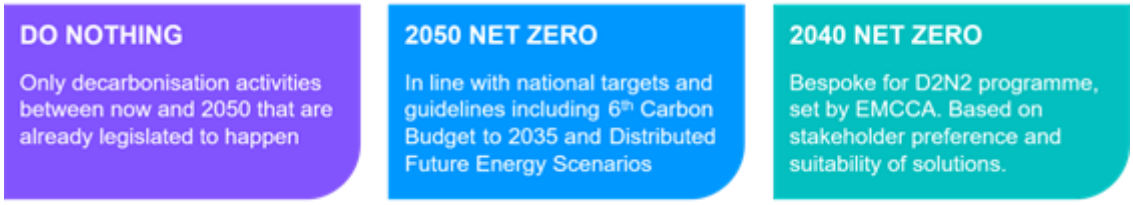
This section sets out the scenario constraints which frame the LAEP, and the approach to deciding which interventions underpin the fundamentals of the transition to net zero for Gedling, Broxtowe and Rushcliffe.

5.1 Overview of Scenarios

Scenarios are a powerful tool in energy planning, letting us explore different futures, understand the impacts of our choices, and prepare for uncertainties. Three scenarios were used as part of this LAEP to explore potential decarbonisation pathways for Gedling, Broxtowe and Rushcliffe.

These scenarios reflect varying levels of ambition and policy contexts, from minimal intervention to accelerated decarbonisation aligned with regional targets. To ensure comparability, key economic parameters such as intervention costs, energy prices, and discount rates were held constant across all scenarios. This supports sensitivity analysis and isolates the effects of policy ambition and technology uptake.

Figure 5.1: Scenarios for the LAEP modelling



5.1.1 Do Nothing

This ‘Do Nothing’ scenario represents what will happen without additional policy (beyond what is already legislated) or without additional infrastructure investment identified in this LAEP. In this way, the ‘Do Nothing’ scenario represents the most probable outcome, if nothing additional was done beyond what is already committed to. The ‘Do Nothing’ acts as the baseline, from which carbon reductions and the cost of the LAEP can be calculated.

This could be characterised as a small amount of consumer engagement in decarbonisation in addition to slow system changes. In the ‘Do Nothing’ scenario, the energy system emissions are reduced, but the scenario does not result is reaching Net Zero. It aligns with the “Falling Short” pathway from the National Grid/Regen Distributed Future Energy Scenarios (DFES).

Each intervention area in the subsequent sections, provides specific detailed counterfactual assumptions and exclusions relevant to the technological solution. The high-level Do-Nothing assumptions are listed in Table 5.1: Do Nothing Modelling Assumptions.

Table 5.1: Do Nothing Modelling Assumptions

Technology Area	Policy landscape and Market Trends
Heating Decarbonisation	As there is currently no legislated mandate for heat pumps, we have assumed no further uptake of low-carbon technologies and a like-for-like replacement of heating systems at the end of their operational life
Building Thermal Energy Efficiency (Fabric Improvements)	We have assumed that all privately rented and social housing currently rated EPC C or below will undergo some form of fabric retrofit in order to meet the MEES target.
Energy Generation	As with air source heat pumps, we have assumed no further uptake of solar PV due to the absence of mandated legislation

5.1.2 2050 Net Zero

Aligned with the UK Government's legally binding target, this scenario reflects a pathway to net zero greenhouse gas emissions by 2050. It is similar to the "Leading the Way" DFES pathway however includes assumptions from the Climate Change Committee (CCC) on retrofit rates and policy impacts. Hydrogen use is considered for industrial clusters, consistent with National Grid's Future Energy Scenarios (FES 2024). This scenario provides a nationally consistent benchmark for evaluating local contributions to UK climate commitments.

5.1.3 2040 Net Zero

The third scenario presented here is bespoke and was customised based on regional level discussions with EMCCA. This scenario accelerates the 2050 scenario to decarbonising the region, including GBR by 2040 through the selected interventions mechanisms.

It is based on technologies all available today and outcomes could be subject to change if not yet proven technologies are approved with a secure supply, such as hydrogen deployment. Uptake assumptions are based on conversations and discussions held with GBR and regional stakeholders.

5.2 Scenario Modelling Approach

Scenario modelling for LAEPs typically follows two main approaches:

- **Standardised Scenarios aligned with regional planning (Top-Down):** LAEPs can adopt industry-standard scenarios, such as the Distribution Network Operator's Distributed Future Energy Scenarios (DFES), which are derived from the National Energy System Operator's Future Energy Scenarios Pathways (FESP). This approach ensures consistency with regional and national planning frameworks.
- **Bespoke Local Scenarios informed by stakeholder input (Bottom-Up):** Alternatively, scenarios can be developed through engagement with local stakeholders, reflecting local priorities and ambitions. This includes input from local authorities, large energy users, community organisations, and businesses. Such collaboration helps identify unique local drivers and constraints that may not be captured in standardised scenarios

Following discussions at the programme level, a bottom-up modelling approach was adopted to estimate the uptake of interventions, informed by local stakeholder input and priorities. Input is also taken from the UK Climate Change Committee's (CCC) Seventh Carbon Budget, which targets a 75% reduction in UK territorial emissions by 2040, achieving net zero emissions by 2050. While DFES projections for the East Midlands follow similar trends, the data can rely on LAEPs for their modelling. Therefore, national projections are used as a scalable proxy for local totals.

To model uptake of interventions, a logistic growth (S-curve) function was applied. This reflects slow initial growth due to barriers such as upfront costs, followed by acceleration in the mid-phase driven by policy support, and eventual saturation near 100%. Uptake is normalised to 100% of the total required installations by the target year, assuming a low starting point in 2026.

During modelling, curve midpoints and growth rates were anchored to concrete national and regional policy signals, and adjusted around these in discussion with stakeholders. Peak annual delivery was capped at realistic levels to reflect workforce and supply chain ramp-up constraints. Annual percentages represent the incremental increase in installations for each year, while cumulative uptake reaches 100% by the target year.

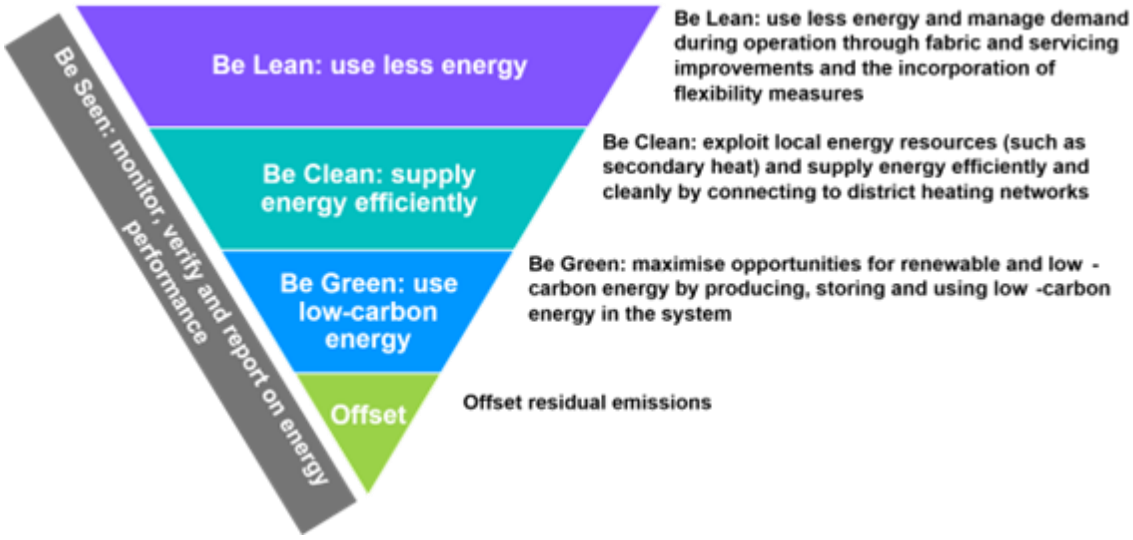
- For the **Net Zero by 2050 scenario**, the uptake curves typically follow the CCC's Balanced Pathway, with local adjustments.
- For the more ambitious **Net Zero by 2040 scenario**, the timeline is compressed by a factor of approximately 1.67 (25 years to 2050 vs. 15 years to 2040). This shifts data points earlier while preserving the S-curve shape.

5.3 Intervention Prioritisation Approach

The idealised approach to achieving net zero emissions is to follow the energy hierarchy as represented in Figure 5.2. It offers a common-sense, cost-effective, sustainable energy policy that aims to reduce energy use before seeking to meet remaining demand by investing in 'be clean' technologies in advance of 'be green' and offset incentives.
The Hierarchy offers an effective framework to guide sustainable energy policy and decision-making.

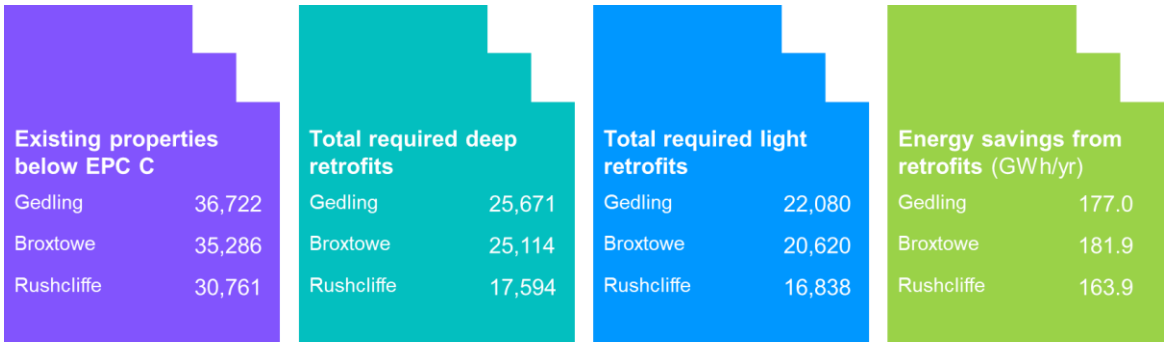
The Interventions identified for Gedling, Broxtowe and Rushcliffe therefore follow this hierarchy, starting with energy efficiency measures and then followed by low-carbon heating alternatives, then supplementing this with installation of local renewables and battery storage.

Figure 5.2: The Energy Hierarchy



6 Energy Efficiency in Buildings

Buildings account for nearly 40% of energy consumption in the UK across all sectors, and this equates to almost a quarter of total emissions UK wide. This section deals with energy efficiency in buildings associated with the upgrade and retrofit of fabric improvement measures. This spans both domestic and non-domestic properties.



The primary focus of retrofit of building fabric improvements is to bring down the “U-Value”, the thermal transmittance measure, of different components of a building to increase its ability to retain heat and ultimately support environmental sustainability. Increased fabric performance and energy efficiency of a buildings can be linked to many direct benefits such as reduced energy bills, reduced fuel poverty, warmer homes and reduced carbon emissions.

There are also many indirect co-benefits that can be realised through energy efficiency or fabric retrofit, the better example being resilience on the energy (gas and electricity) grids through the reduced energy demand from homes and businesses which is crucial to tackling climate change. Building fabric retrofit also contributes to the growth of local economies through the creation of jobs and is ultimately linked to the increased health and well-being of the population through the reduction of cold and damp related ailments.

Additionally, implementing retrofits will reduce the overall thermal heat demand of properties. This reduction will be pivotal when transitioning to electric heating systems. This is because it will lower the required heating capacity of properties, which in turn will significantly cut the total capital costs associated, as well as reducing operating energy costs. Further details are provided in Chapter 7 Low Carbon Heating.

6.1 Existing Building Stock

6.1.1 Domestic Housing Stock

Domestic housing accounts for 94% of all buildings across the three boroughs of Gedling, Broxtowe and Rushcliffe, so targeted energy interventions here will have a significant impact on the local energy transition and carbon emissions. Domestic housing includes social housing, private rented and owner-occupied tenure types.

Gedling, Broxtowe and Rushcliffe’s housing stock is diverse, including Victorian and Edwardian terraces, interwar council housing, post-war suburban estates, rural cottages, and more recent suburban developments from the 1990s onwards. Broxtowe and Gedling have larger concentrations of mid-20th century housing, while Rushcliffe includes a higher proportion of detached homes and newer build developments, particularly in areas like West Bridgford and Bingham.

Measures to reduce both thermal and electrical demand through improved fabric performance and targeted energy efficiency measures will help lower energy consumption, reduce carbon emissions, and support the transition to low-carbon heating and electrification across each borough.

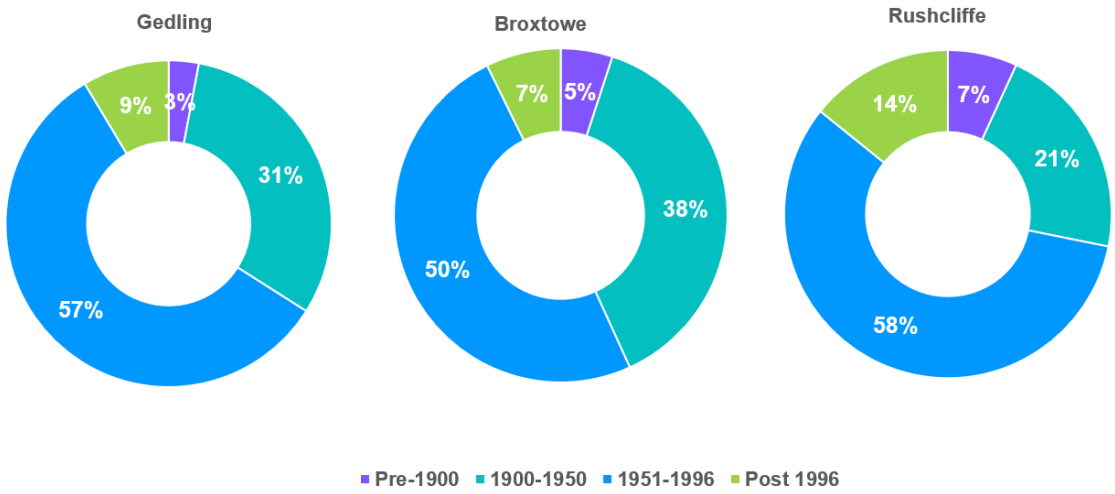
In the context of EMCCA and this LAEP, energy efficiency will play a critical role in demand reduction and heat decarbonisation across the area. Through following the first step of the Energy Hierarchy, “Be Lean”, it is possible to bring wider benefits such as creating warmer homes, improving internal air quality and thermal comfort, reducing energy use, all giving occupants more certainty over their energy bills, and a reduction in the risk of fuel poverty.

The UK’s Energy Performance Certificate (EPC) data provides insight into the thermal efficiency of dwellings across the country. EPC ratings are the most widely used indicator of a building’s energy efficiency level and are based on data points collects across building fabrics (insulation, windows, construction type, age), heating and hot water system and electrical demand (lighting, electric heating and appliances).

To address the energy transition needs of the local area it is pertinent first to understand the emissions context of the area as explored in Section 3 Current Emissions and Energy Use and the “tools” that the region authority might have at their disposal by way of energy interventions. The scale of retrofit needed to improve building energy efficiency levels is indicated by construction dates of existing housing, which will indicate what pre-existing energy-efficiency measures are in place.

Figure 6.1 displays the breakdown of age bands of properties across GBR. Properties built between 1900-1996 account for the vast majority of all housing, and housing built between 1951-1996 and 1900-1950 makes up 57% and 27% respectively. The year a property was built significantly influences the construction methods, materials and insulation levels within the property. Homes constructed pre-1900s are likely built with solid external walls and very little insulation which in turn means they can be draughty and not airtight, which means they are challenging to retrofit.

Figure 6.1: Split of domestic buildings by age band across Gedling, Broxtowe and Rushcliffe



The oldest homes, pre-1900 and 1900–1929, typically feature solid brick or stone walls with lime mortar and no cavity, giving estimated U-values above 2.1 W/m²K, roughly eight times worse than current standards[23]. However, their usual wet plaster finish does offer some airtightness. Although these buildings can be durable and architecturally significant, they normally require more complex retrofit solutions, which is likely dependent on factors such as statutory planning protection (e.g., listings, conservation areas). The technological challenge of applying external or internal wall

[23] Conservation of fuel and power: Approved Document L - GOV.UK

insulation is a significant technical barrier, while cost and affordability present financial barriers. The disruption of the work is also likely to be a major consideration, particularly for internal wall insulation.[24]

The 1930–1949 band marks the architectural transition to cavity wall construction. While these walls offer slightly better conductive performance (typically around 1.5 W/m²K) because of the air gap, they introduced new vulnerabilities. These early cavities were built for moisture prevention rather than thermal retention and were left uninsulated. Additionally, the move to suspended timber floors in this era often makes this cohort significantly prone to higher air infiltration rates compared to their solid-walled predecessors. As a result, these homes tend to have poorer baseline efficiency and higher heat loss without targeted retrofit measures. It should be noted that the EPC data will reflect where changes have occurred to the properties since the year built, i.e. the installation of double glazing or addition of loft insulation. This has therefore been captured in our assessment.

The 1983–1995 and post-1996 segments, coincides with the introduction and progressive tightening of Approved Document L within the Building Regulations. First introduced in 1985 and updated significantly in 1995, 2002, and 2006, these regulations mandated strict limits on air permeability, thermal bridging, and U-values. The ~10% of stock built post-1996 likely benefits from mandatory double glazing, floor insulation, and high-performance loft insulation, achieving an EPC rating of C or higher by design. While these newer properties require minimal fabric intervention, they represent a small share of the domestic housing stock.

Homes constructed post-2000 may only require minimal upgrades to reach EPC rating C and above, if they aren't already achieving these levels based on as built and installed fabrics and systems. It may, however, be difficult to achieve EPC rating C for the local area's older properties given the increased complexity in delivering full fabric and energy retrofit improvements, as well as the high costs associated with deep retrofit.

Applying external or internal wall insulation carries a significant financial cost, which is another barrier to more widespread installation.[25] It is therefore unsurprising that a substantial proportion of Gedling, Broxtowe and Rushcliffe's homes fall below the UK Government's recommended EPC rating of C or above. The proportion of homes rated D or lower is 57%, 66% and 55% across Gedling, Broxtowe and Rushcliffe respectively, evidencing their high energy demand and poor insulation levels. This further raises the importance of fabric retrofit and energy efficiency as a priority in the area.

Furthermore, the challenge to improve the energy efficiency of older properties is further reinforced through conservation area designations, listed building controls and Article 4 Directions, which encapsulate a significant proportion of buildings in Gedling, Broxtowe and Rushcliffe. Given the complexity of these planning restrictions and the variance in their application, designated buildings require assessment on a case-by-case basis to determine which retrofit measures are feasible, often associated with higher costs and added complexity to navigate planning requirements. Whilst a standardised approach to deploying light and deep retrofits may be suitable for more urban areas with newer housing stock, a targeted and tailored approach will be required.

The following sections breakdown each local authority's mix of housing stock construction dates and related EPC ratings, per MSOA for each borough.

[24] Retrofit Internal Wall Insulation: guide to best practice

[25] Department for Business, Energy and Internal Strategy, *Retrofit Internal Wall Insulation: Guide to Best Practice* (Publisher and year not specified)

Figure 6.2: Proportion of Age Band of Buildings across Gedling MSOAs

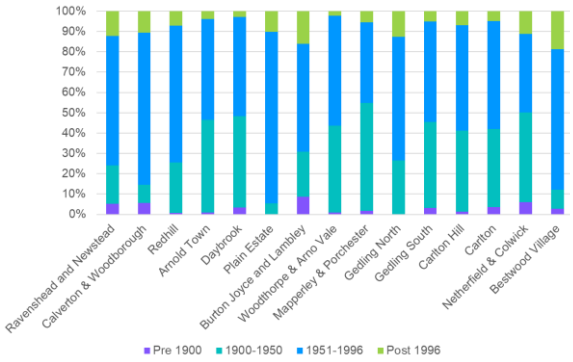


Figure 6.3: Proportion of EPC Ratings Across Gedling MSOAs

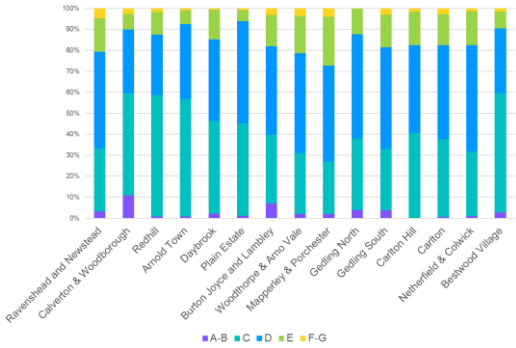


Figure 6.4: Proportion of Age Band of Buildings across Broxtowe MSOAs

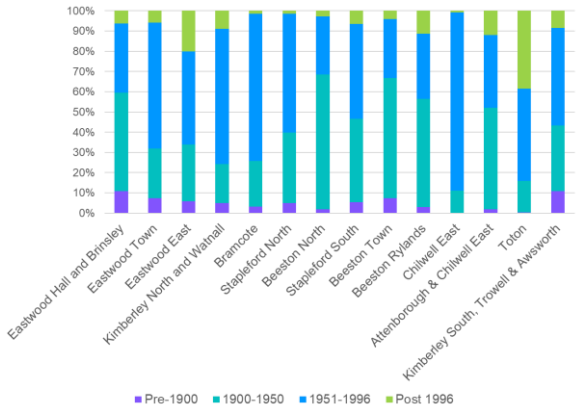
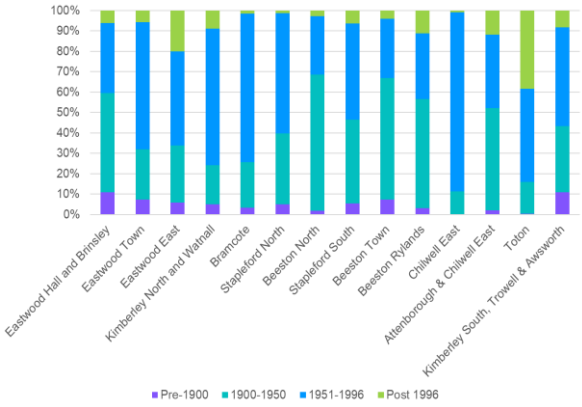


Figure 6.5: Proportion of EPC Ratings Across Broxtowe MSOAs



In Gedling, the housing stock comprises of a mix of post-war council housing, Victorian terraces and modern suburban developments. Gedling Borough Council has set out its own housing ambitions in the Gedling Local Development Plan to build 11,358 new homes in the period 2024-2043.

Broxtowe has an urban and rural mixed population, with 60% of the population living in urbanised areas compared to 40% living in the countryside. 60% of Broxtowe's housing is built between 1900-1966 and these are predominantly EPC rated D-G, implicating poor energy efficiency due to insufficient insulation and outdated heating systems. The borough council plans to build 250 new homes between 2025 and 2030 to align with its asset Management Strategy.[26]

Rushcliffe's population is largely rural and divided between six larger settlements[27] , with the largest being West Bridgford. The housing stock in Rushcliffe sees a mix of pre-1945 construction housing found in both older villages and town centres, as well as mid-20th century suburban growth in West Bridgford and Bingham initiating a larger portion of housing dated between 1945-1980s. Areas such

[26] Broxtowe Borough Council, Housing Delivery Plan 2025 – 2030. (Broxtowe Borough Council, 2025)

[27] Broxtowe Borough Council, Nottingham City Council, Rushcliffe Borough Council. Greater Nottingham Strategic Plan (2025)

as Edwalton and East Leake have many post-2000 constructed dwellings. The council proposes to build a further 830 houses per annum between 2024 and 2029.[28]

Figure 6.6: Proportion of Age Band of Buildings across Rushcliffe MSOAs

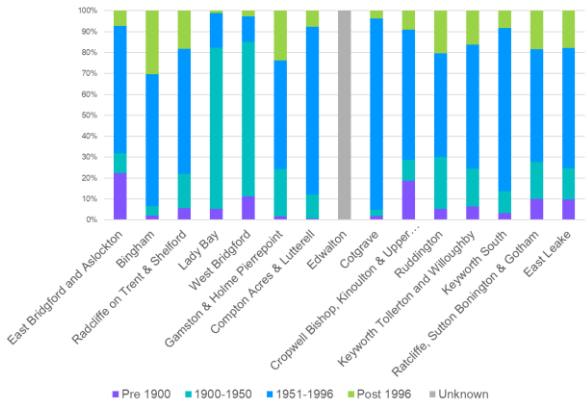
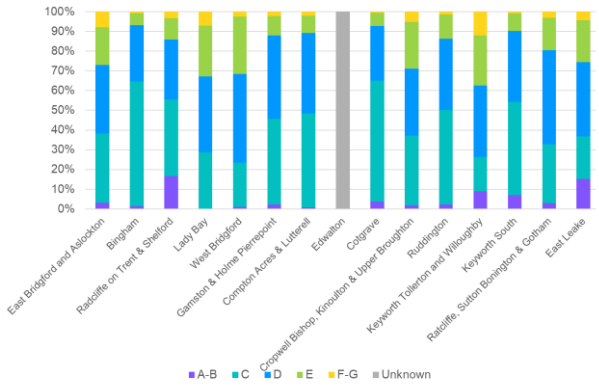


Figure 6.7: Proportion of EPC Ratings across Rushcliffe MSOAs

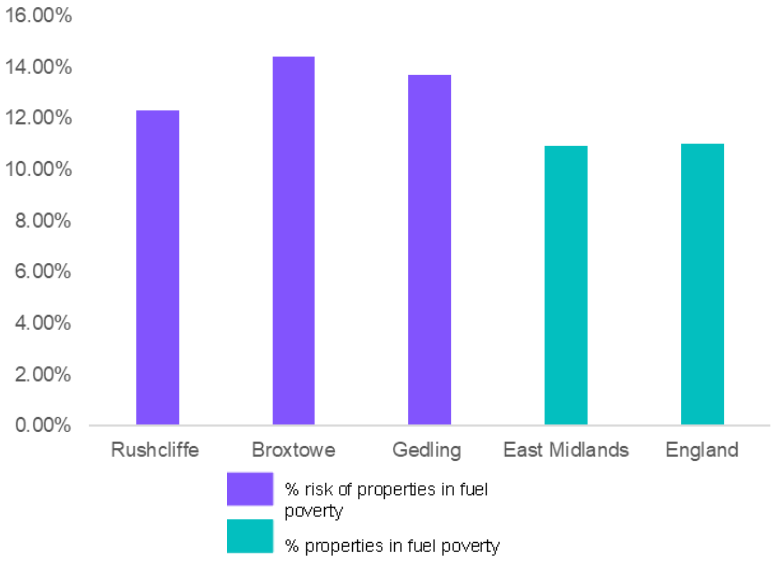


The home analytics dataset used within this LAEP did not include EPC ratings or age band data for Edwalton's building stock, therefore this area was excluded from retrofit modelling.

Homes constructed post year 2000 may only require minimal upgrades to reach beyond EPC rating C, if they aren't already achieving these levels based on as built and installed fabrics and systems. It may, however, be difficult to achieve EPC rating C for GBR's older properties given the increased complexity in delivering full fabric and energy retrofit improvements, as well as the high costs associated with deep retrofit.

It is likely that this challenge will continue to influence the level of fuel poverty experienced in the region. The current proportion of households at risk of being in fuel poverty across GBR sits at 13.5%, a rate higher than both the East Midlands average of 10.9% and the national average of 11%.

Figure 6.8: Proportion of Fuel Poor Households in GBR



The Low-Income Low Energy Efficiency (LILEE)[29] definition of fuel poverty was introduced in 2019 which classifies a household as fuel poor if it spends more than 10% of its annual income on space heating and energy services. This is more likely in a home rated EPC E or below due to lack of insulation and poor thermal retention capability.

[28] Rushcliffe Borough Council. Five Year Housing Land Supply Assessment. (Rushcliffe Borough Council, 2025)

[29] Department for Energy Security and Net Zero, *Fuel Poverty Methodology Handbook 2025: Low Income Low Energy Efficiency (LILEE)* (UK Government, 2025)

Fuel poverty currently contributes to around 155 excess winter deaths across EMCCA annually, which emphasises how retrofitting homes can have a huge impact on reducing this alongside reducing health inequalities and reducing absences from school and work arising from damp and cold air related illnesses.[30]

The darker blue areas on IES' digital twin map screenshot in Figure 6.9 illustrates that the risk fuel poverty varies around the region with increased likelihoods in both urban areas and rural areas. The areas most at risk of fuel poverty are Daybrook and Netherfield and Colwick in Gedling, West Bridgford and Ratcliffe, Sutton Bonnington and Gotham in Rushcliffe, and Beeston Town, Beeston North and Eastwood Town in Broxtowe.

Figure 6.9: Average Risk of Fuel Poverty per Household across GBR

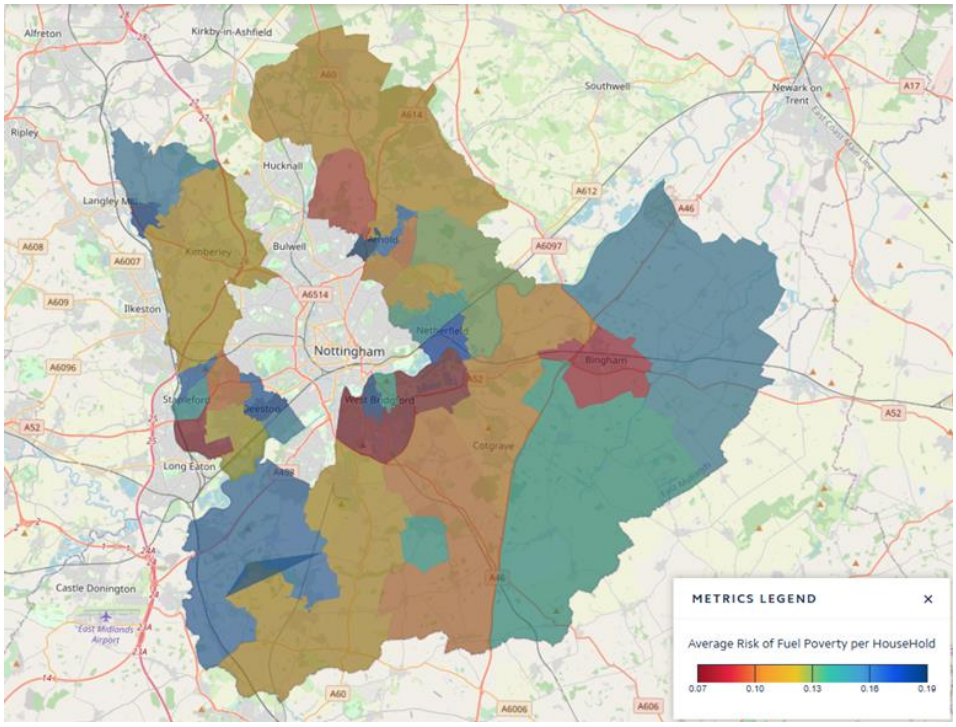


Figure 6.10 shows the tenure breakdown across the area. Of the homes within Gedling, Broxtowe and Rushcliffe, 84% of homes are owner-occupied, 10% are privately rented, and 7% are social housing. Owner-occupied properties account for the majority of domestic thermal demand across GBR.

This diversity in ownership is a strong influence on the scale and pace of fabric upgrades across the region's domestic housing. This is mostly due to incentives, availability of funding as well as the availability of skilled workers to deliver the upgrades.

Across all tenure types, lighter retrofit measures will understandably be more affordable and therefore have a shorter payback than deep retrofit. With typical payback periods of approximately five years, light retrofit is more likely to be affordable for homeowners especially those in the owner-occupied bracket. However, this intervention would not result in the same thermal or energy efficiency impacts as deep retrofit could, as the cost and payback is much less favourable to the homeowner.

There are currently, no incentives to upgrade fabrics exist for private landlords to raise the rating of their properties above an EPC E. Social housing providers have the ability to buy fabric upgrade measures in bulk and can manage procurement more effectively for their own energy efficiency programmes, which are often part or fully funded through public sector grant funding. Recently social

[30] East Midlands Combined County Authority, *East Midlands Retrofit Strategy* (East Midlands Combined County Authority, 2025)

housing has seen increased funding support from government through the Social Housing Decarbonisation Fund and the Warm Homes Social Housing funding.

6.1.3. Non-Domestic and Commercial Building Stock

The non-domestic sector accounts for 6% of the buildings across Gedling, Broxtowe and Rushcliffe. These buildings span the public and commercial sectors and are utilised for a variety of primary uses, as identified in Figure 6.12. Detailed in this figure is the total number of non-domestic building split by primary use case.

The EPC values of non-domestic properties were evaluated to identify priority areas, as highlighted in Figure 6.11 below. Approximately 81% of Gedling, Broxtowe and Rushcliffe's non-domestic buildings are rated EPC D and below. When compared to the domestic EPC ratings across different MSOAs, there is a much greater diversity in location and energy efficiency, with no pattern or consistency across the region.

Figure 6.10: Proportion of Tenure Types across Gedling, Broxtowe and Rushcliffe MSOAs

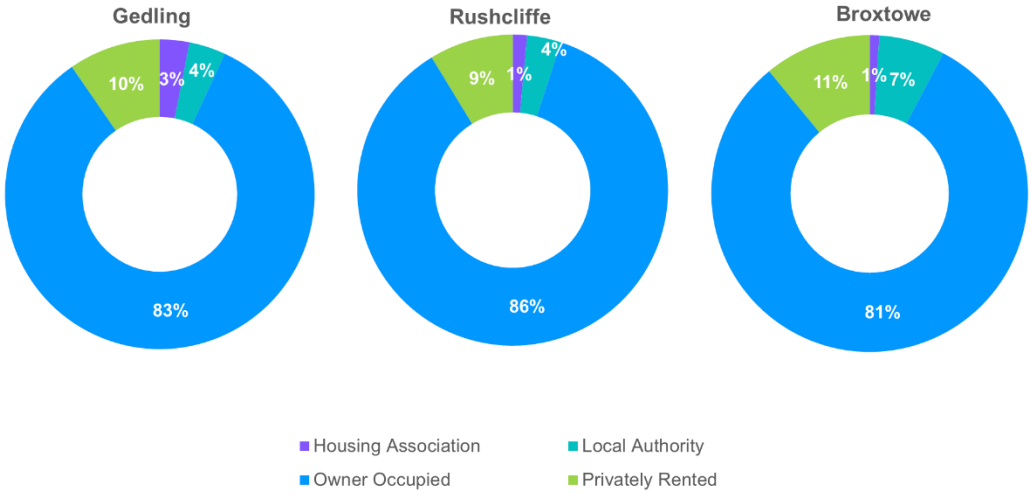
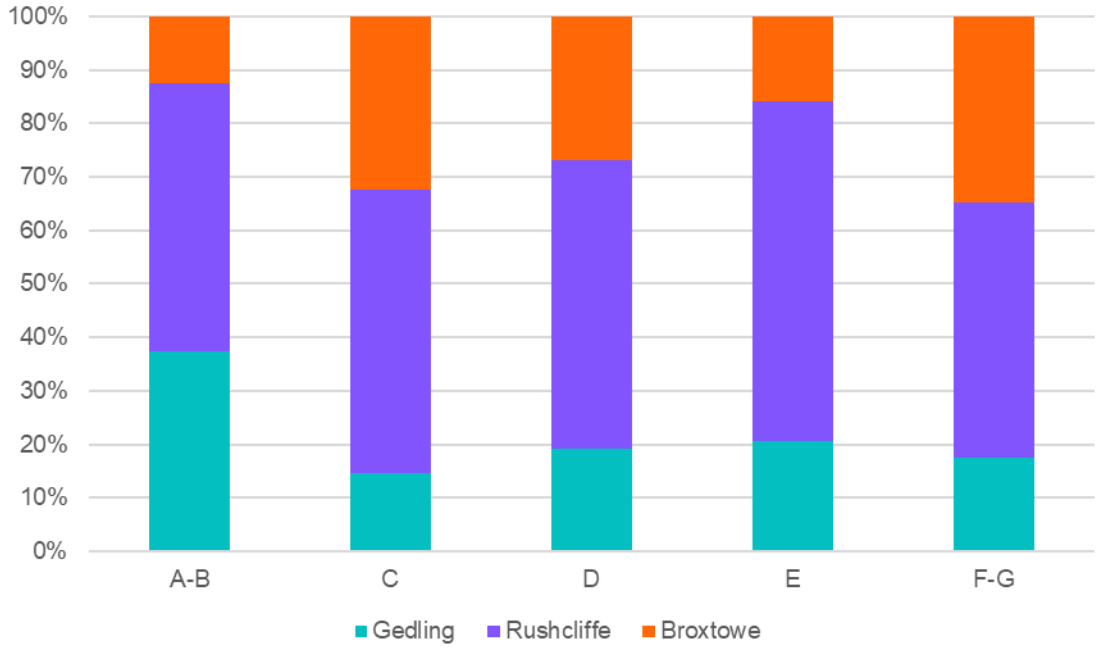


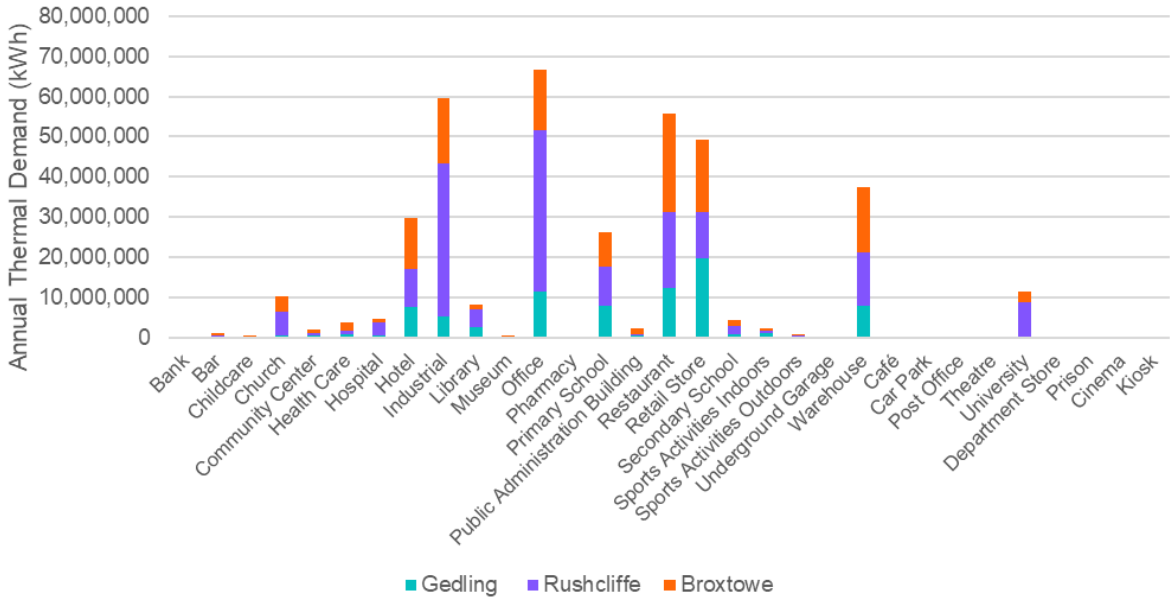
Figure 6.11: EPC Ratings of Non-Domestic Buildings across GBR



The thermal demand across different non-domestic building types is shown in Figure 6.12, which highlights the key building types in need of energy efficiency improvements. The office properties exhibit significantly higher thermal demand than the other building types, primarily due to the large volume of the properties across GBR, identifying this building type as a priority to retrofit.

The EPC dataset used in this assessment was limited and did not contain information on specific fabric condition and construction types. It is therefore unclear whether the increased demand in these building types is driven by operational systems and activities specific to each use, or by poor thermal efficiency of the buildings themselves.

Figure 6.12: Total thermal demand of non-domestic properties in Gedling, Broxtowe and Rushcliffe split by primary use



This data gap reflects broader issues with the methodology for undertaking and reporting non-domestic EPCs, where the current policy landscape has less strict drivers regarding the uptake of ongoing energy assessments. Currently, one of the only policies in place requires all rented commercial properties in the UK must have a minimum EPC rating of E. To progress energy efficiency in non-domestic building stock requires further energy studies on non-domestic buildings to provide more available data to aid in identifying and implementing energy efficiency measures across the properties.

Within the scope of this LAEP, the opportunity to accurately represent the decarbonisation of the non-domestic sector depends on the availability of data. The fabric and energy efficiency measures most appropriate for each non-domestic building will depend heavily on the primary use of the building. Different uses like offices and industrial building will have significantly different building fabrics, equipment type and operational profiles, and occupancy patterns which will affect which measures are most suitable and effective for each building.

Different primary uses also have varying funding mechanisms for how to implement improvements; public sector buildings are more likely to receive more UK Government grant funding than private office buildings, the Public Sector Decarbonisation Scheme is a good example of this type of funding support. In the absence of available funding for commercial buildings, it is important other incentives or regulations for private building be developed by the UK Government to support the implementation of energy efficiency and fabric upgrade measures.

During the LAEP development and through the stakeholder engagement with non-domestic stakeholders and estate managers, ongoing retrofit programmes amongst non-domestic buildings, such as schools, colleges and the NHS, where highlighted. All programmes mentioned were following fabric first approaches despite funding limitations. To ensure continued operation of such buildings out of hours periods (e.g. end of term) were being used to implement such measures or complete upgrades.

The fabric improvement principles of energy efficiency discussed in section 6.1.1 equally apply to non-domestic buildings to support their means to achieving net zero compliance and attain the same key benefits such as improved thermal comfort for building users. Office buildings tend to share similar characteristics, such as building envelopes, room layouts, and energy systems, presenting an opportunity for standardised retrofit approaches. Implementing retrofit at scale across these building type may pose a more straightforward opportunity compared to other non-domestic building types, which tend to be more varied in design and function. For these building types, more bespoke retrofit approaches may need to be undertaken incurring further complexity and therefore costs.

One challenge within the commercial buildings sector however is the commercial ownership and rental model, where large office or retail buildings are owned by large commercial asset owners and rented to those utilising the space. This means that the ability of the local business or organisation within the space to effect energy efficiency change within their environment is relatively minimal compared to the domestic sector. However, by the same principle, increased energy efficiency and fabric standards applied to commercial buildings could impact those large asset owners encouraging their engagement in retrofitting their assets prior to rental or sale.

6.2 Intervention methodology

6.2.1 Energy Interventions

To meet the legally binding decarbonisation targets for the UK, significant levels of energy efficiency improvements need to be undertaken across the country. For GBR's diverse domestic and non-domestic sectors to reach the levels of uptake needed for net zero compliance the two chosen scenarios - a 2040 and 2050 net zero scenario, as well as a counterfactual "do nothing" scenario – have been modelled using two energy efficiency interventions.

The specific fabric upgrades that were modelled into GBR's LAEP were split into the following Retrofit categories shown in Table 6.1. There are approximately 34,000 buildings in Gedling, 32,000 building in Broxtowe and 25,000 buildings in Rushcliffe requiring some degree of retrofit across these light and deep retrofit categories in order to meet MEES compliance as a minimum.

Table 6.1: Light and Deep Retrofit Definitions

Light Retrofit Criteria	Deep Retrofit Criteria
Cavity Wall Insulation: Applied to properties identified as having cavity walls that are currently uninsulated (excluding timber frame construction to avoid damp and moisture risk).	**Window Upgrades**: All single-glazed windows proposed to be upgraded to double glazing.
Full Loft Insulation: Targeted to properties where the predicted loft insulation depth is between 0–50mm, effectively meaning they have no insulation.	**Solid Wall Insulation**: Applied to properties with solid brick or stone walls that are currently uninsulated.
Loft Top-Up Insulation: Applied to homes with an existing insulation depth of 50–150mm, where we topped up with an additional 200mm of insulation.	**Floor Insulation**: Based on Home Analytics data, we targeted buildings with either suspended floors or those with an unheated space below, provided these floors were not already insulated.

6.2.2 Building Fabric – Do Nothing

This scenario considers the current pathway, based on currently mandated legislation at the time of completion of this LAEP. It assumes that all existing national legislation is implemented in relation to energy efficiency, which includes the following policies:

The UK Governments Minimum Energy Efficiency Standards (**MEES**) **regulations**[31], which applies to private-rented properties not owner-occupied, currently states that a property cannot be rented unless it has an EPC rating of E or higher. This is anticipated to increase to EPC C or higher by 2030.

The Future Homes and Buildings Standard (2025) is assumed to be implemented and will mandate that all new builds are constructed as 'net zero ready', future proofed for low carbon heating and with 'world leading' levels of energy efficiency. This bill aims to have all new builds at an EPC rating of C or higher, however 85% of new build properties in England are already achieving a minimum EPC rating of B. We therefore assume that all houses constructed after 2025 will be to an EPC B or higher.

The UK Government is encouraging the improvement of housing stock via these policies and incentives, the impacts of which have been incorporated into our modelling of the "do nothing" scenario. Some other means to improving energy efficiency are highlighted but have not been included as they are not mandated legislation.

The Social Housing Fund's (2025–2028+) front-load light measures on social housing stock (13% of the total housing stock), also aligns with the CCC 7th carbon budget Balanced Net Zero Pathway emphasising the rapid rollout of efficiency measures first such as extensive insulation by the mid-2030s followed by heat pumps.

[31]HM Government, *Improving the Energy Performance of Privately Rented Homes: 2025 Update* (Department for Energy Security and Net Zero, 2025)

The UK government is consulting on tightening MEES toward EPC C this decade for the Private rented sector (PRS), so modelling saw an acceleration for the wider PRS (15% of entire housing stock) from 2028–2030 without over-claiming a firm legal mandate.

6.3 Light Retrofit

The light retrofit option represents a lower cost retrofit option, focusing on less intrusive insulation improvements. This option is targeted for homes requiring less significant thermal efficiency improvements. Measures such as cavity wall insulation and loft insulation are lower cost than internal and external solid wall insulation and have been identified to have a significantly reduced payback compared with deep retrofit approaches.

It is important that this level of retrofit is made available especially to vulnerable individuals. The opportunity to complete light retrofit could result in long-term benefits such as warmer homes and reduced energy bills for residents, and greater energy resilience across the region.

In order to find which homes require light retrofits, the existing fabric levels were analysed using Home Analytics datasets to find where improvements are needed. The extent of the improvements required was assessed against the impacts of light and deep retrofit, described in Table 6.1, to quantify the extent of light retrofit needed.

Figure 6.13, identifies the intensity of light retrofit installations required across the three local authorities, where blue indicated a higher percentage requirement. This showcases Broxtowe to have the highest concentration for light retrofit installations, followed by the Southwestern area of Arnold in Gedling. The lower requirement areas are consistent with areas that have had recent housing developments such as Bingham and West Bridgford in Rushcliffe.

Figure 6.13: Number of homes requiring light retrofit across the three Local Authorities

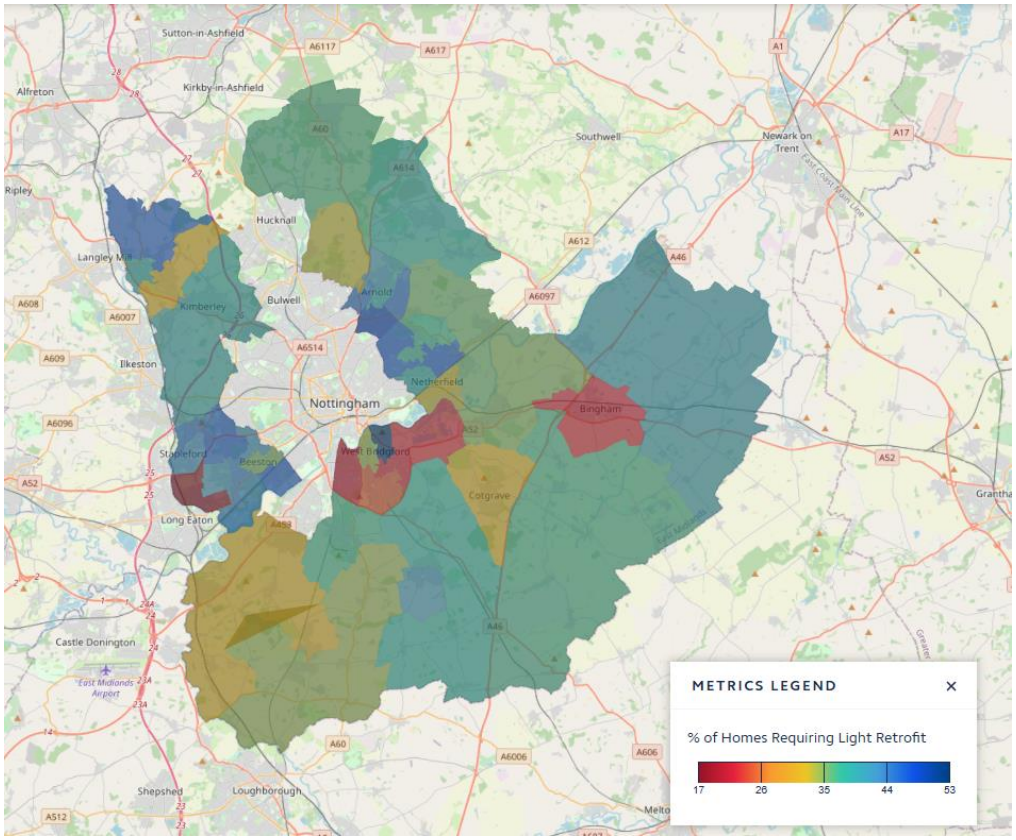


Figure 6.14: Cumulative uptake of light retrofit required per scenario

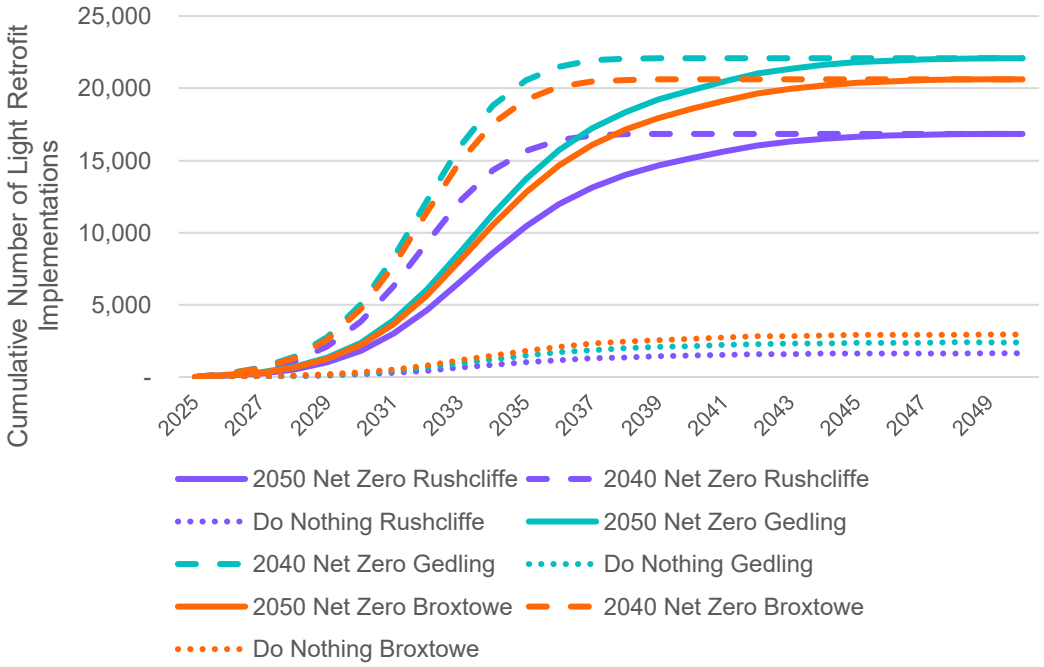


Figure 6.14 underlines the required year on year uptake of light retrofit for the 2050, 2040 and do-nothing scenarios. The do-nothing scenario considers the expected retrofit of private rented properties as part of MEES regulations and follows a similar update trajectory.

The 2040 and 2050 scenario uptake growth rates are informed by mandated national and regional policies, including the UK Government's Warm Homes Plan, which seeks to front-load retrofit measures with a particular emphasis on social housing, representing 6.6% of Gedling, Broxtowe and Rushcliffe's total housing stock.[32] Uptake rates are also aligned with the Climate Change Committee's Seventh Carbon Budget net zero pathway, which prioritises the rapid deployment of energy efficiency measures ahead of low-carbon heating installations.[33]

Additionally, the uptake profile assumes a slower rate of delivery between 2025 and 2030, reflecting current workforce and supply chain capacity. From 2030 onwards, retrofit demand is expected to drive significant growth in both workforce skills and supply chain capability, enabling a sharper acceleration in uptake.

[32] Warm Homes: Local Grant policy guidance

[33] The Seventh Carbon Budget - Climate Change Committee

Figure 6.15: Annual light retrofit installations for preferred scenario

Year	Annual percentage uptake	Gedling Annual uptake	Broxtowe Annual uptake	Rushcliffe Annual uptake
2025	0%	0	0	0
2026	1%	265	247	202
2027	2%	375	351	286
2028	4%	773	722	589
2029	6%	1369	1278	1044
2030	10%	2252	2103	1717
2031	15%	3246	3031	2475
2032	18%	3930	3670	2997
2033	17%	3732	3485	2846
2034	13%	2848	2660	2172
2035	8%	1788	1670	1364
2036	4%	927	866	707
2037	2%	442	412	337
2038	0%	88	82	67
2039	0%	44	41	34
2040	0%	0	0	0

Figure 6.15 outlines the required year on year uptake light retrofit uptake rate for the 2050, 2040 and do-nothing scenarios. The do nothing represents the counterfactual scenario, considering the expected retrofit of private rented properties as part of MEES regulations and follows a similar update trajectory.

In order to meet the pathway targets of the local area in each scenario however, light retrofit upgrades are not sufficient on their own. For some properties further thermal efficiency is required to meet the heat grade provided by a heat pump or district heating, so deep retrofit has also been modelled within the LAEP.

In both the 2040 and 2050 scenarios, a total of 59,538 homes are required to have light retrofit upgrades across the three local authorities, combined.

6.4 Deep Retrofit

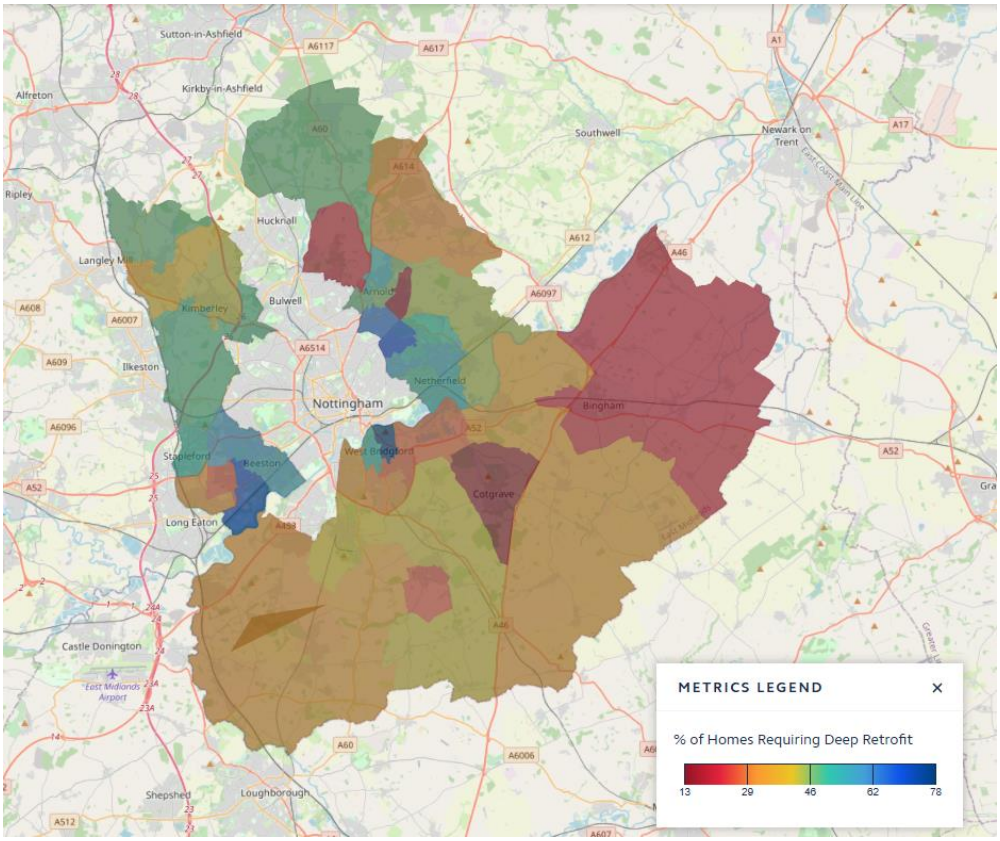
The deep retrofit option represents a more costly approach, requiring more intrusive insulation improvements. It is intended for homes that need significant enhancements in thermal efficiency.

As described in Table 6.1, the deep retrofit encompasses fabric upgrades for solid wall insulation, glazing upgrades and floor insulation. These retrofit measures are tailored to older housing stock, which often feature building envelopes that benefit most from these fabric upgrades, such as solid stone walls, single glazing and suspended floors.

Similarly to light retrofit, the home analytics dataset within the digital twin of Gedling, Broxtowe and Rushcliffe was used to identify where deep retrofit measures would be suitable for each property, based on building fabric and construction type. The aim of this approach was to ensure that every property achieved adequate insulation levels, with a dual purpose of reducing the risk of fuel poverty and enabling the efficient installation and operation of a low-carbon heat source. This is discussed further in Section 7.

Figure 6.16 displays the MSOAs by percentage deep retrofit requirements across the three Local Authorities. These areas are concentrated around the inner city. The central urban zones of Gedling, Broxtowe and Rushcliffe, including Lady Bay, Attenborough and Chilwell East, Mapperley and Porchester, Woodthorpe and Arno Vale show the highest concentration of deep retrofit demand.

Figure 6.16: Homes Requiring Deep Retrofit by MSOA



These are historic industrial areas with large concentrations of pre-1940 terraced housing blocks. Properties here are made from solid masonry and are therefore challenging to insulate, however, the thermal mass of these properties can support better insulation due to the heavy stone. It is important in this instance to consider ensuring adequate airtightness for improved thermal efficiency, to ensure that when the low carbon heating systems are installed, they are effective. This is discussed further in Section 7.

It is vital to address older building types as they will be most at risk of poor thermal comfort levels as well as associated health risks. Deep retrofit measures in these properties will provide additional benefits through alleviating excess cold infiltration. Even without heating technology improvements, fabric upgrades enable resilience through reduced gas and electricity consumption, generating immediate energy savings benefits, reducing energy bills for homeowners or tenants and reducing carbon emissions.

Households with lower income levels will be the least likely to undertake and pay for the high cost of deep retrofit measures, so appropriate support must be offered in such circumstances to ensure a just transition. Retrofit programmes must be designed with support mechanisms for low-income households and incentives for landlords. Targeting may be required in areas of high fuel poverty that have a large proportion of privately rented homes. Owner-occupied homes may have greater autonomy to invest in upgrades, while rented properties particularly in the private sector, face challenges due to split incentives and regulatory constraints.

Figure 6.17 underlines the annual deep retrofit uptake requirement for the 2050, 2040 and do-nothing scenarios. The do nothing represents the expected retrofit of private rented properties as part of MEES regulations. Similar to light retrofits, the 2040 and 2050 scenario uptake growth rates were informed by mandated national and regional policies alongside considering the growth of the supply chain to limit the uptake to realistic levels. However, the rates have been slightly reduced to account for the increased scope and costs associated with deep retrofit upgrades, in comparison to light retrofits.

Figure 6.17: Cumulative uptake of deep retrofit required per scenario

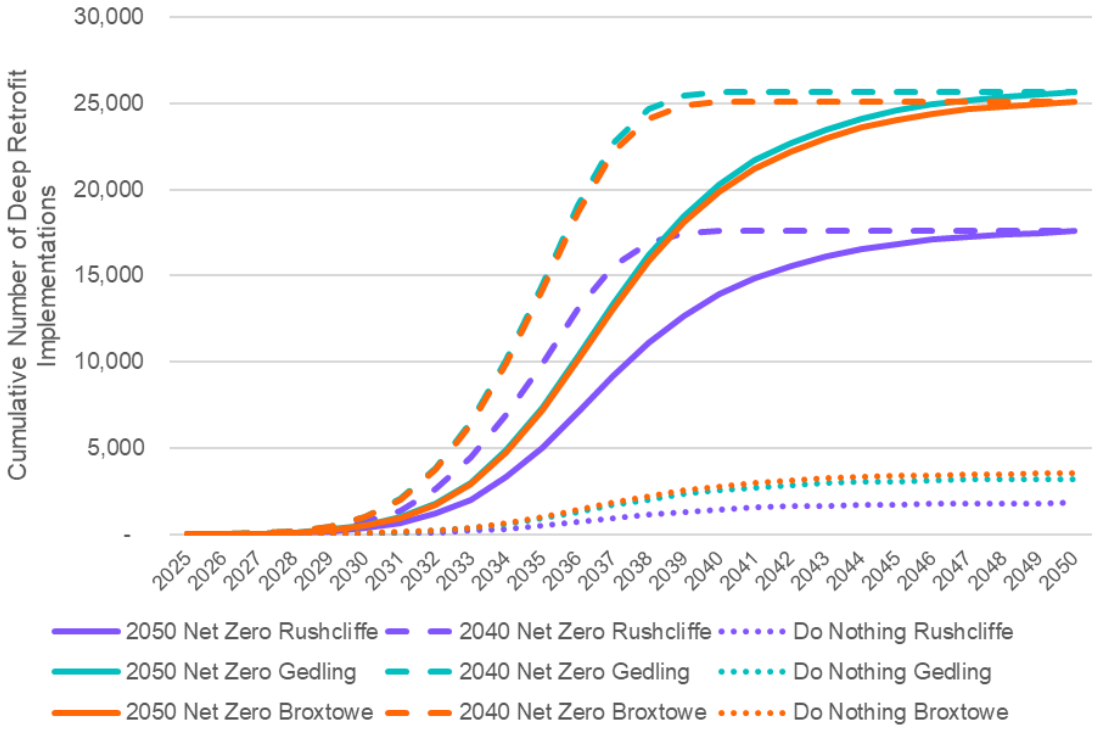


Figure 6.19 - Figure 6.21 display the total number of retrofit installations required across the region, highlighting the number of properties requiring either light, deep or no retrofit.

There is an additional category for the housing stock which will require both light and deep retrofits. Analysis from the home analytics data indicates that there is certain proportion of housing that will require a combination of light and deep retrofit to achieve sufficient energy efficiency.

Retrofit installations is expected to be widespread across the region, necessitating installations across all tenure types. This will require coordinated engagement from both the public and private sectors, including the development of incentives and potential funding mechanisms to support the transition. Since the capital expenditure will be the main hurdle for retrofits to be implemented, the funding mechanism will play a crucial part in facilitating the transition, especially for fuel poor homes and those at risk of being fuel poor due to the build quality of their homes.

Figure 6.18: Annual deep retrofit installations for preferred scenario

Year	Annual percentage uptake	Gedling Annual uptake	Broxtowe Annual uptake	Rushcliffe Annual uptake
2025	0%	0	0	0
2026	0%	26	25	18
2027	0%	51	50	35
2028	1%	128	126	88
2029	1%	282	276	194
2030	2%	539	527	369
2031	4%	1027	1005	704
2032	7%	1771	1733	1214
2033	10%	2670	2612	1830
2034	14%	3645	3566	2498
2035	17%	4364	4269	2991
2036	18%	4595	4495	3149
2037	14%	3620	3541	2481
2038	8%	1925	1884	1320
2039	3%	796	779	545
2040	1%	231	226	158

Figure 6.22 displays the projected annual thermal energy savings from domestic retrofits, driven by the reduced heat demand resulting from fabric upgrades. This identifies the significant increase in energy efficiency of homes, resulting from light and deep retrofits. The successful implementation of fabric retrofits across the region will bring a host of benefits including significant energy savings, carbon reductions, cost savings, energy resilience, as well as numerous health and wellbeing outcomes such as increased thermal comfort and improved internal air quality.

Refer to Section 12 Economic Appraisal for further analysis and in depth technoeconomic discussion on costs of each intervention across each net zero scenario.

6.5 Impacts

Retrofit installations are expected to be widespread across the region, necessitating installations across primarily privately rented and owner-occupied tenure types. The building stock within social housing portfolios is primarily comprised of EPC C or above homes so retrofit will be less concentrated in this sector. Coordinated engagement from the private sector with support from the public sector will be required to develop the incentives, potential funding mechanisms and uplift awareness to support the transition. Since the capital expenditure will be the main hurdle for the implementation of retrofits, these funding mechanisms would aid in ensuring the retrofit upgrades are accessible to all properties. The ability for the local authorities to influence retrofit upgrades given they will primarily be required in privately owned buildings is also a barrier.

Households with lower income levels will be the least likely to undertake and pay for the high cost of deep retrofit measures, and to some extent light retrofit measures as well, so appropriate support must be given in such circumstances to ensure a just transition towards net zero by 2040 or 2050. Retrofit programmes must be designed with support mechanisms for landlords and incentives for low-income households.

Additional targeting may be required in areas of high fuel poverty that have a large proportion of privately rented homes. Owner-occupied homes may have greater autonomy to invest in upgrades, while rented properties particularly in the private sector, face challenges due to split incentives and regulatory constraints.

The high prevalence of homes considered as heritage, listed, within a conservation area or within a World Heritage site poses an additional level of complexity. Deploying retrofits in these homes is not only more challenging from a technical perspective, but the costs are often higher with ‘run-of-the-mill’ options unsuitable. Deep retrofit would be difficult for listed buildings, as many modern retrofit methods are not compatible and consents would be required. In addition, no blanket rules are applicable, and no two listed buildings are the same.

Broadly speaking, retrofits in ‘hard-to-treat’ homes require consideration on a ‘case-by-case’ basis. Local authorities and other stakeholders in Gedling, Broxtowe and Rushcliffe areas emphasised throughout the LAEP process that for residents of these buildings, it is largely unknown what interventions are allowable and with the additional complexity of navigating planning constraints, pursuing these measures is inaccessible or in the ‘too-hard’ basket for many.

Where funding programmes are available, local authorities focus on distributing funds across the maximum number of homes possible, to ensure that as far as possible funds deliver the largest benefits to the region and are deployed in a fair and equitable manner.

With local authorities continually faced with funding pressures, this often means that retrofit measures are prioritised for ‘easier’ or ‘quick-wins’ homes, with local authorities left to prioritise homes without clear guidelines. In many cases, these homes are left with a higher funding gap to cover or no funding option at all.

As such, a comprehensive, clear strategy to deploying retrofits at ‘hard-to-treat’ homes is necessary – drawing on a combination of local authority support, specialist expertise, targeted funding, collaborative roll-out programmes, all building off accessible advice at zero-cost (at least initially). An educational programme would also support those in the ‘able-to-pay’ bracket to streamline understanding and empower owners to proceed with retrofit deployments, as further discussed in Section 13. Refer to Section 12 - Economic Appraisal for further analysis and in depth technoeconomic discussion on costs of each intervention across each net zero scenario.

Figure 6.19: Number of buildings requiring each kind of retrofit per MSOA for Gedling

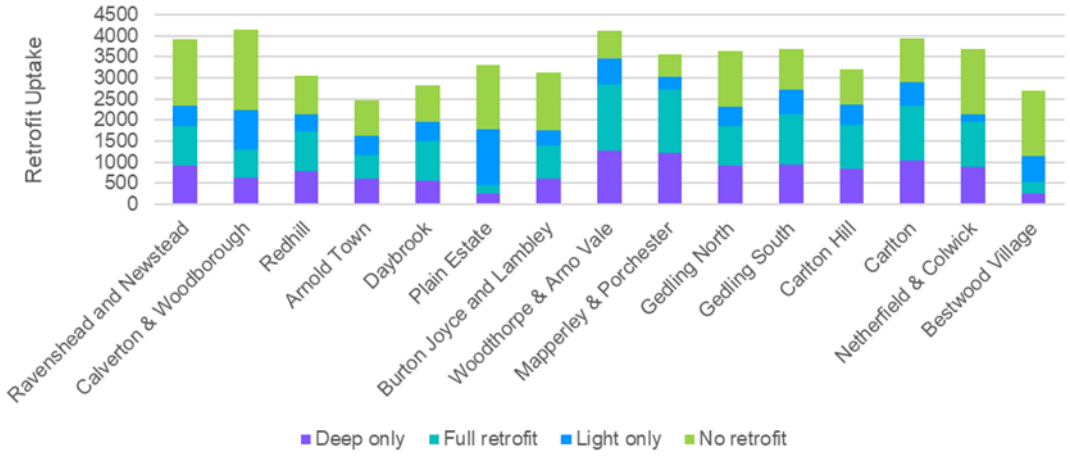


Figure 6.20: Number of buildings requiring each kind of retrofit per MSOA for Broxtowe

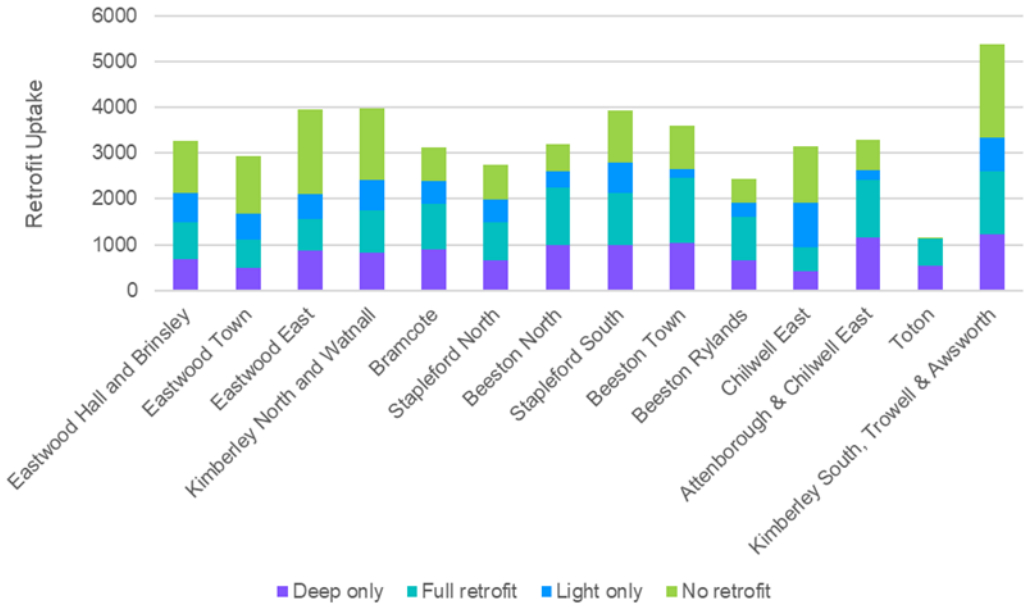
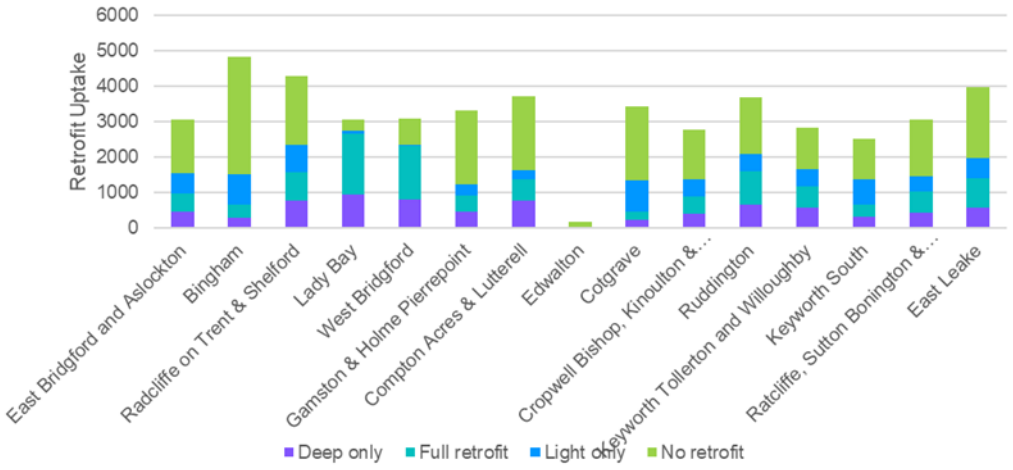


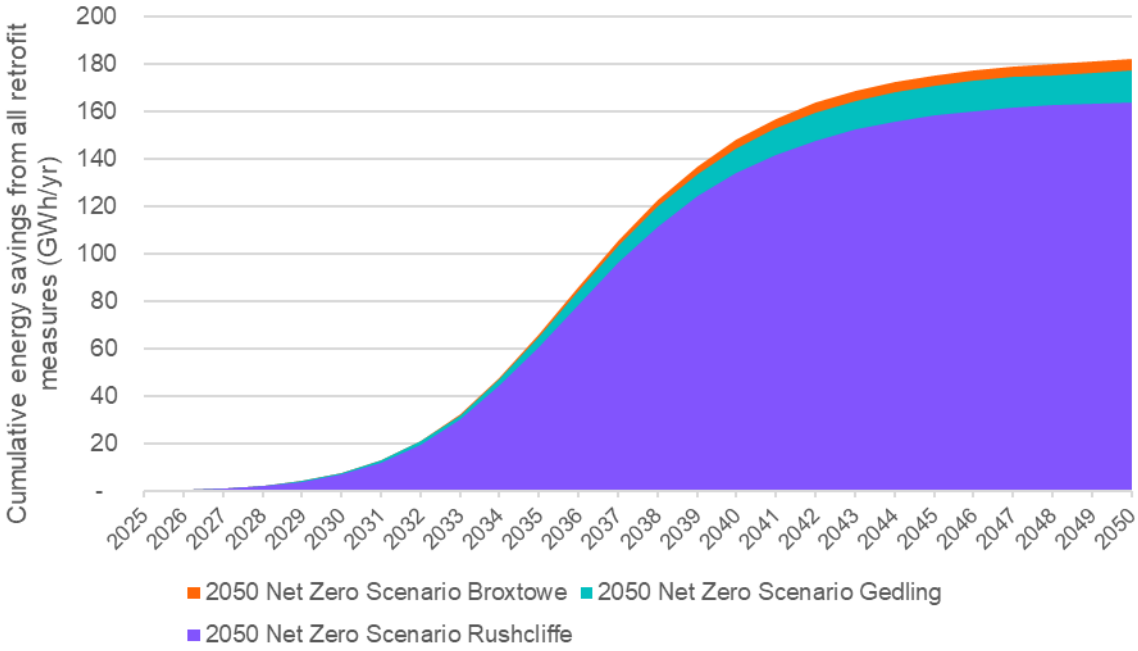
Figure 6.21: Number of buildings requiring each kind of retrofit per MSOA for Rushcliffe



The successful implementation of these retrofits will introduce significant energy savings across the region while satisfying thermal comfort levels within each property. Figure 6.22 displays the projected annual thermal energy savings from domestic retrofits, driven by the reduced heat demand resulting from fabric upgrades. This identifies the significant increase in energy efficiency of homes, resulting from light and deep retrofits.

The energy savings will provide vast benefits both to residents and Councils, providing cost and carbon savings leading to a host of other benefits. These include alleviating fuel poverty, as households that were previously thermally inefficient would be able to heat their homes affordably.

Figure 6.22: Annual Projected Combined Energy Savings of Deep and Light Retrofit



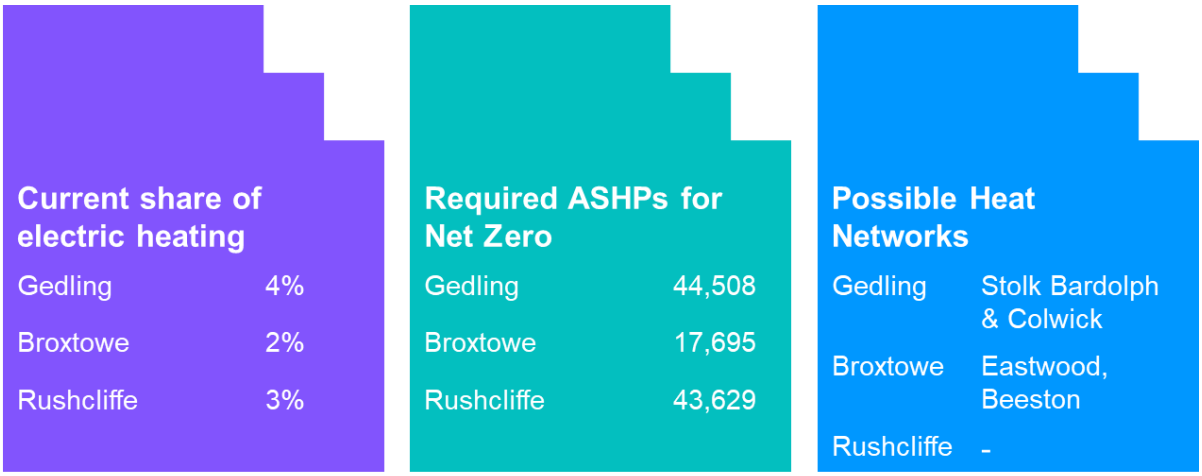
Additionally, these benefits will be extended as and when low-carbon heating technologies are deployed. As, the retrofit measures will act as a foundational step allowing the low carbon technologies to efficiently operate, allowing for further savings.

This would not only lead to immediate energy savings and lower utility bills for residents but also contributes to the reduction of carbon emissions associated with gas use. In addition, the resulting decrease in thermal demand will help reduce the anticipated strain on the local grid as the region transitions to a greater share of electrified heating systems in the future.

7 Low Carbon Heating

This section analyses how low carbon space heating technologies can be implemented to support Gedling, Broxtowe and Rushcliffe achieve net zero carbon emissions. Currently, the majority of domestic and non-domestic buildings rely on fossil fuels to meet their space heating and hot water demands, presenting a significant challenge. To decarbonise heat consumption, most buildings will need to transition to low-carbon technologies, primarily those powered by electricity.

7.1 Domestic sector



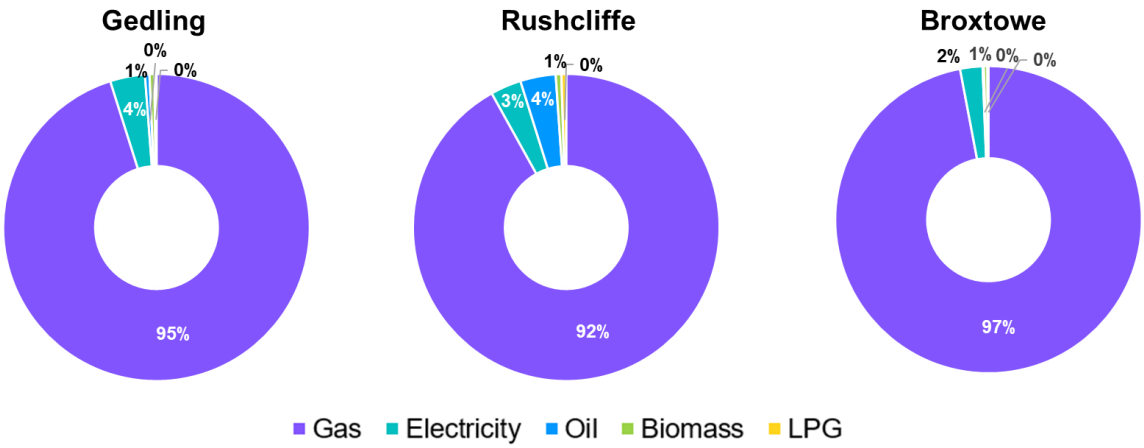
7.1.1 Existing system

Natural gas is the predominant fuel across Gedling Broxtowe and Rushcliffe, supplying space and water heating to approximately 93% of homes, primarily through gas-fired boilers. This reliance reflects the widespread availability of the gas network across the three areas and the predominance of existing housing stock connected to the mains. 2-4% of dwellings currently rely on electric heating systems, including both electric heat pumps and resistive electric heating. The remaining share consists of properties using oil or solid fuel, largely in rural areas without gas grid access. Around 2% of Gedling, Broxtowe and Rushcliffe homes use oil, liquefied petroleum gas (LPG), or biomass for heating. Most homes in this category will need to transition to a decarbonised heat source.

This profile closely mirrors national patterns, where around 85–88% of UK homes use gas as their main heating source, 9% use electricity, and the remainder rely on oil or other fuels[34]. The slightly higher gas dependency across Gedling, Broxtowe and Rushcliffe indicates a lower baseline of electric or low-carbon heating uptake compared to the national average, underlining the scale of the transition challenge ahead.

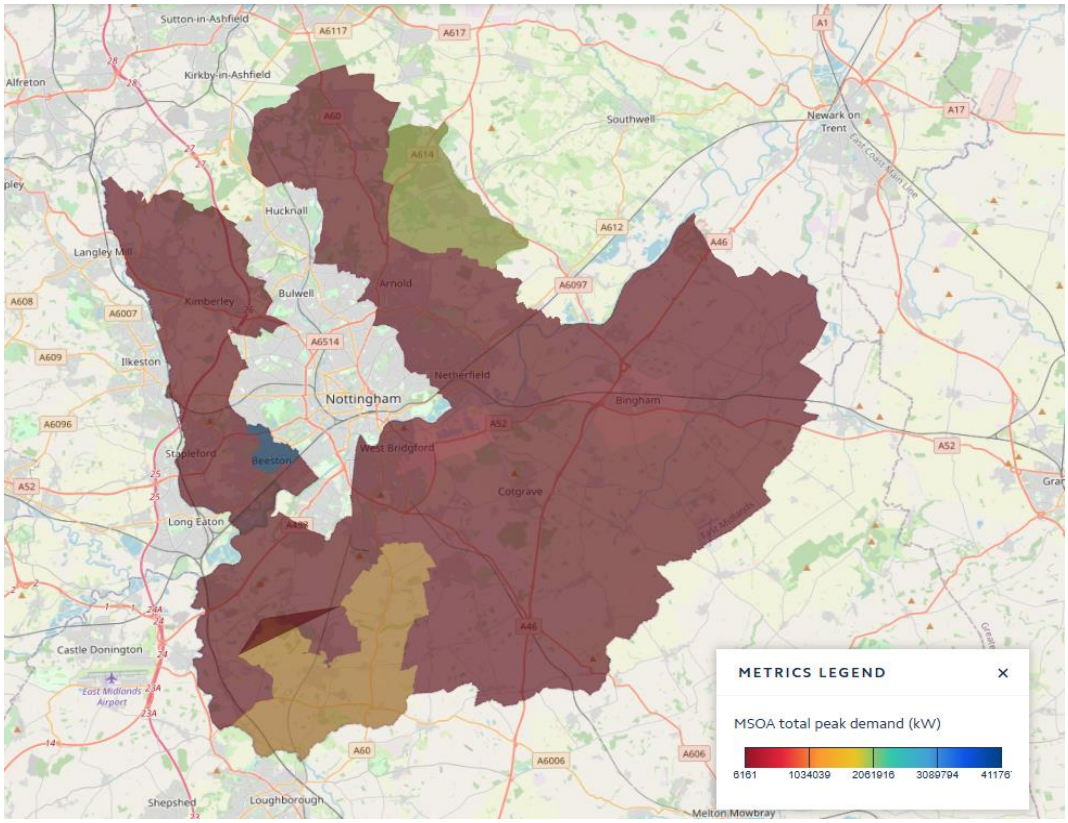
[34] Department for Energy Security and Net Zero (DESNZ), *Energy Consumption in the UK: Domestic Energy Data Tables (ECUK 2023)*.

Figure 7.1: Gedling, Broxtowe and Rushcliffe Domestic Heating Split by Fuel type (%)



Each borough exhibits subtle local differences driven by housing stock, urban density, and levels of gas network coverage. Gedling records a slightly higher proportion of electric heating, consistent with a greater number of off-gas properties and new-build developments adopting heat pumps. This reflects early progress toward decarbonised heating, particularly in areas undergoing regeneration or expansion beyond the mains gas network. Gedling has actively participated in retrofit programmes and has a notable share of homes not connected to the gas grid, making it suitable for low-carbon heating technologies.

Figure 7.2: Thermal heat demand per MSOA



Broxtowe aligns most closely with the Gedling, Broxtowe and Rushcliffe average, with natural gas remaining the dominant heating source. Its housing mix, spanning urban centres like Beeston and

suburban areas such as Kimberley and Stapleford, has a balanced distribution of heating types. While electric heating uptake remains modest, Broxtowe has implemented several retrofit schemes and energy efficiency programmes, including Energy Company Obligation (ECO) grants and external wall insulation projects.

Rushcliffe displays a more uniform reliance on gas heating, despite being the most rural of the three boroughs. The borough includes a larger number of villages and dispersed settlements, with West Bridgford being the only distinctly urban centre. Its strong connectivity to the gas grid and fewer off-gas properties likely contribute to this consistency. Rushcliffe's rural housing profile presents challenges for heat pump adoption, including higher retrofit costs and insulation requirements, which may explain its slower transition toward low-carbon heating technologies compared to Gedling.

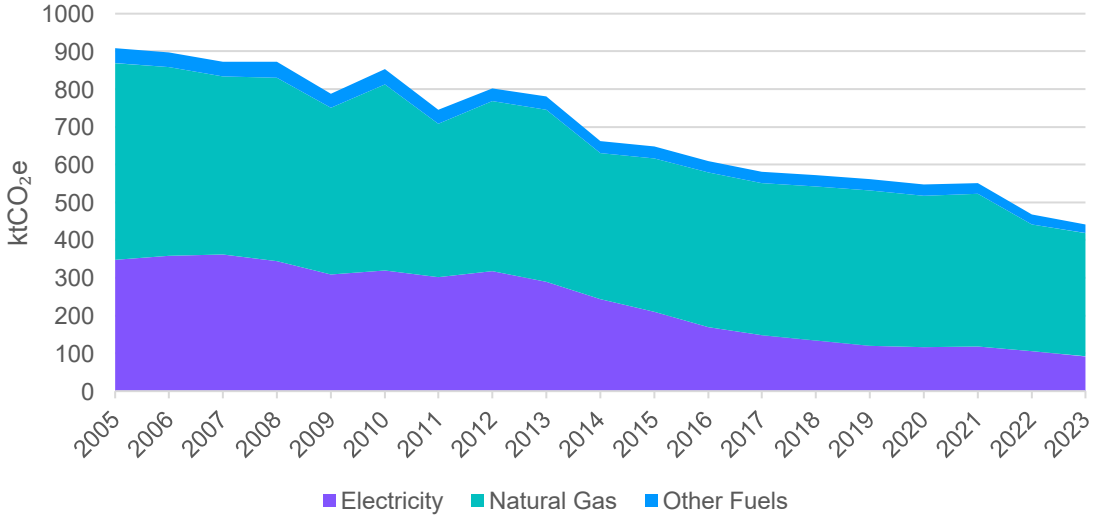
Despite these minor variations, the three areas share a common baseline of high gas dependency and limited early uptake of electric or low-carbon heating systems. This suggests that regional-scale interventions such as retrofit programmes, heat pump incentives, and local network upgrades will be critical in driving a coordinated transition across all three areas.

In terms of emissions, Figure 7.4 presents the historical carbon emissions associated with domestic fuel use across the combined GBR area. Emissions from natural gas have consistently been the largest contributor, amounting to approximately 326.6 $ktCO_2e$ in 2022, followed by electricity-related emissions at around 92.4 $ktCO_2e$. Since 2005, total domestic emissions have declined substantially across all fuel types. The most pronounced reduction has occurred in electricity-related emissions, reflecting the decarbonisation of the national electricity grid.

Emissions from natural gas have also decreased, though more gradually. This reduction likely stems from improved energy efficiency standards, building insulation upgrades, and the replacement of older, inefficient boilers with modern condensing models. In addition, modest behavioural changes and local retrofit programmes may have contributed to lower overall gas consumption per household.

Each area follows the same overall downward trend in long-term emissions reductions across gas and electricity since 2005. Despite these gains, natural gas remains the dominant source of domestic carbon emissions, underlining the challenge of transitioning to low-carbon heating and improving building fabric performance at scale.

Figure 7.3: Domestic Historical Carbon Emissions Breakdown in Gedling, Broxtowe and Rushcliffe ($ktCO_2e$)



Gedling shows a slightly sharper fall in gas-related emissions, supported by its active participation in retrofit programmes such as the East Midlands Domestic Retrofit Project. The borough has targeted

off-gas and low-efficiency homes for boiler replacements and insulation upgrades, contributing to a more rapid decline in gas consumption per household.

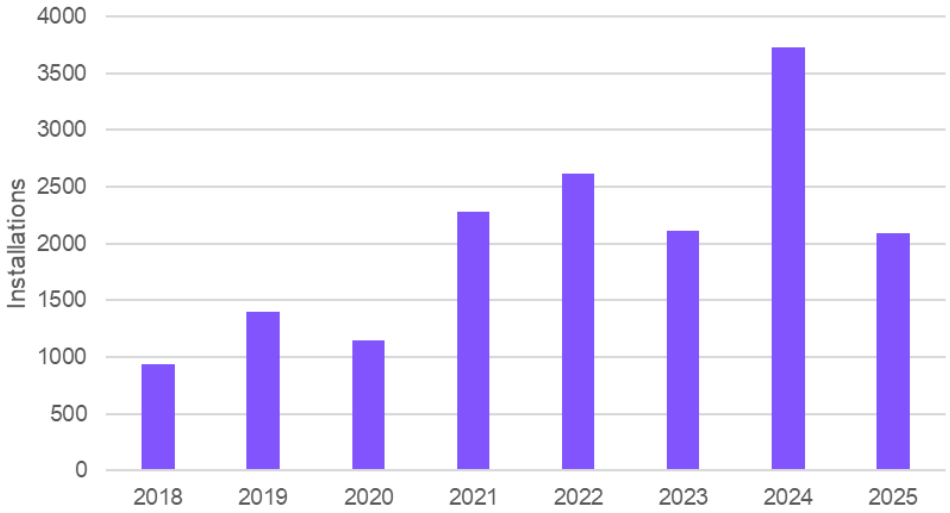
Broxtowe maintains a steadier decline in gas emissions, closely aligned with the Gedling, Broxtowe and Rushcliffe average. The borough has implemented multiple retrofit schemes, including external wall insulation for over 80 solid wall properties and energy upgrades to more than 350 council homes under the Warm Homes Social Housing Fund. These efforts reflect consistent progress without dramatic shifts.

Rushcliffe exhibits the highest residual gas emissions among the three, which corresponds with its larger population[35] and older housing stock. While the borough has adopted low-carbon planning policies, the pace of retrofit activity and boiler replacement has been slower compared to Gedling and Broxtowe.

7.1.2 Low Carbon Heating System Installations

It has been assumed for this LAEP that air source heat pumps will be the primary alternative to natural gas fuelled heating systems in order to meet GBR's net zero goals. However, given the high portion of older or listed buildings, consideration of alternative low-carbon heating measures will be required, as ASHPs are often not suitable to these building types. Historic heat pump uptake is illustrated in Figure 7.4. There is a steadily growing uptake of heat pumps since 2018 in the East Midlands with 3,726 installations recorded in 2024. While this upward trend is encouraging, heat pumps still represent a small fraction of space heating compared to the total housing stock. Government data also tracks heat pump installations at the local authority level through the Boiler Upgrade Scheme. Figure 7.4 shows that both Local Authorities follows the regional trend, with an increasing trend in installation numbers.

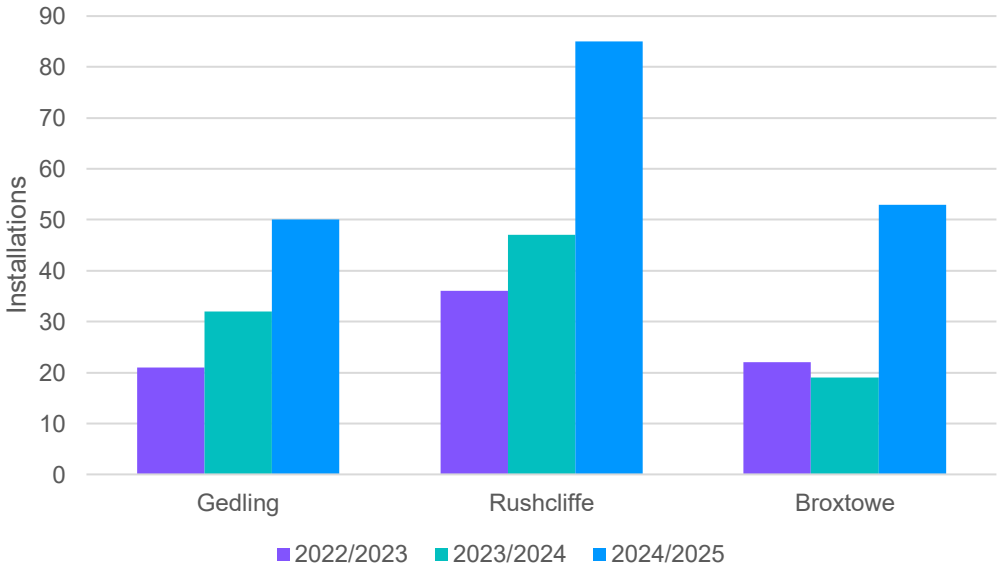
Figure 7.4: East Midlands historical heat pump installations



Source: Heat pump deployment statistics: June 2025 - GOV.UK

[35] Office for National Statistics (ONS) 2023, *How life has changed in Rushcliffe: Census 2021*, ONS.

Figure 7.5: Gedling, Broxtowe and Rushcliffe Boiler Upgrade Scheme Heat Pump Installations



Source: Boiler Upgrade Scheme statistics: August 2025 - GOV.UK[36]

The UK Government publishes quarterly data on heat pump deployment by region. As shown in Figure 7.5, there is a steadily growing uptake year on year of heat pumps since 2018 in the East Midlands. 3,726 installations were recorded in 2024 and projections for 2025 are on track to exceed this. While this upward trend is encouraging, heat pumps still represent a small fraction of space heating compared to the total housing stock.

Government data tracks heat pump installations at the local authority level through the Boiler Upgrade Scheme (BUS). Figure 7.5 presents the number of BUS-supported heat pump installations across all three boroughs based on BUS dataset. The three areas closely follow the wider East Midlands trend, with relatively modest but steadily increasing uptake since the scheme's launch.

In the 2024/25 financial year, Gedling, Broxtowe and Rushcliffe recorded 188 heat pump installations through the scheme with 50 heat pumps installed in Gedling, 53 in Broxtowe and a total of 85 deployed in Rushcliffe. With over 135,000 homes using natural gas and an average boiler lifespan of 15 years, GBR sees roughly 9,000 gas boiler replacements each year. However, approximately 2% of boiler replacements across the three boroughs currently result in a switch to heat pumps. This is largely due to the high upfront cost of installation, the complexity of the process, and the need for additional fabric improvements (each of which presents significant financial and technical barriers, as discussed in section 6.

While installation rates remain low compared to the scale of the existing gas boiler stock, this emerging growth in heat pump adoption is already beginning to contribute to the gradual reduction in natural gas demand as previously discussed in the observed domestic emissions data (Figure 7.3). Each new low-carbon heating system installed displaces a gas boiler, and although the overall impact on total emissions remains limited at present, it represents a tangible shift in heating technology choices across the GBR area.

To decarbonise domestic heating across GBR, the current share of electric heating must increase significantly. Even with potential future restrictions on boiler replacements in the 2030s, early and proactive measures are essential to accelerate the uptake of low-carbon heating technologies in the short term.

[36] Boiler Upgrade Scheme statistics: August 2025 - GOV.UK

7.1.3 Do Nothing

The do-nothing scenario here assumes minimal policy requirements for heat decarbonisation. The only assumed policy intervention in this area is a ban on fossil fuel heating in new builds from 2030[37], with no policy implemented regarding the removal of fossil fuel heating systems from existing buildings.

While there is noticeable growth in heat pumps, most of these installations are assumed to be from the fossil fuel boiler ban in new builds, with only a small percentage occurring from existing gas boilers changing systems. Heat pump uptake is expected to be very low due to the lack of policy incentives and grant funding available. However, after 2035, gas boiler to heat pump conversions are expected to pick up slightly.

As per the UK's 7th Carbon Budget, there is a planned phase-out of fossil fuel boilers by 2035. Installations of heat pumps in GBR have been modelled to reach a peak around 2032–2035 before tapering off.

This is based on policy including the Boiler Upgrade Scheme and £7,500 grants which will continue to be given out as advised by Ofgem. Both incentivise installation and thus improves the rate of near-term uptake. This is anticipated to be extended with a further £1.545 billion in additional funding projected for 2025-2028.

Other regulatory changes to permitted development rights for ASHPs will remove current installation barriers such as the 1-meter boundary rule for ASHPs, making installations easier for more types of homes and can boost uptake significantly.

7.1.4 Intervention Methodology

We have considered feasible installation of heat pumps in all building types that are currently using any fuel type other than electricity or biomass.

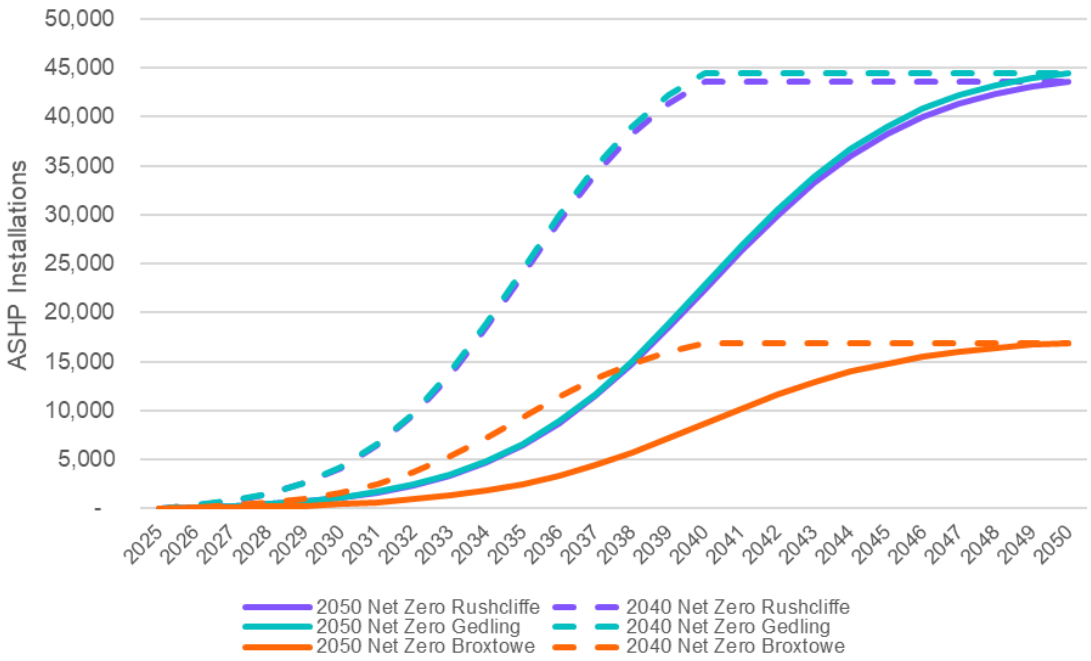
The digital twin has been used to model the changes in energy use and carbon emissions from the switching of fossil fuel boiler systems to heat pumps. The additional peak electrical demand and annual electricity consumption has been built into the projected modelling for carbon emissions reduction and impacts of the local grid. Therefore, the buildings' new total electricity consumption, post heat electrification, will equal "ASHP demand" plus "total electricity retrofit" (or the baseline total electricity for the buildings with no fabric improvements). For buildings that already use electric heating, it is assumed that this heating source will remain unchanged.

The two net zero compliant scenarios developed as part of this LAEP anticipate significantly more installations to take place compared to the counterfactual, by assuming all homes will have a net zero heating system by 2040 or 2050.

Nottinghamshire does not currently have a county-wide target for the deployment of low-carbon heating technologies including heat pumps. However, all three GBR councils have adopted planning guidance and climate strategies that actively support the rollout of heat pumps and energy efficiency improvements. These include commitments to zero-carbon new builds and retrofit programmes, as outlined in their respective climate action plans.

[37] Note that the new Future Homes Standard, summarised in Section 2.1.9 now legislates for no fossil fuel heating in new builds from 2025, at the time of the DFES publication this date was still set to be 2030

Figure 7.6: 2050 and 2040 domestic heat pump uptake projections



The 2040 and 2050 scenarios assume a full electrification of space heating, with no hybrid heat pump installations. This scenario assumes a relatively consistent, steady uptake of heat pumps, which accelerates slightly in the mid-2030s across all three boroughs.

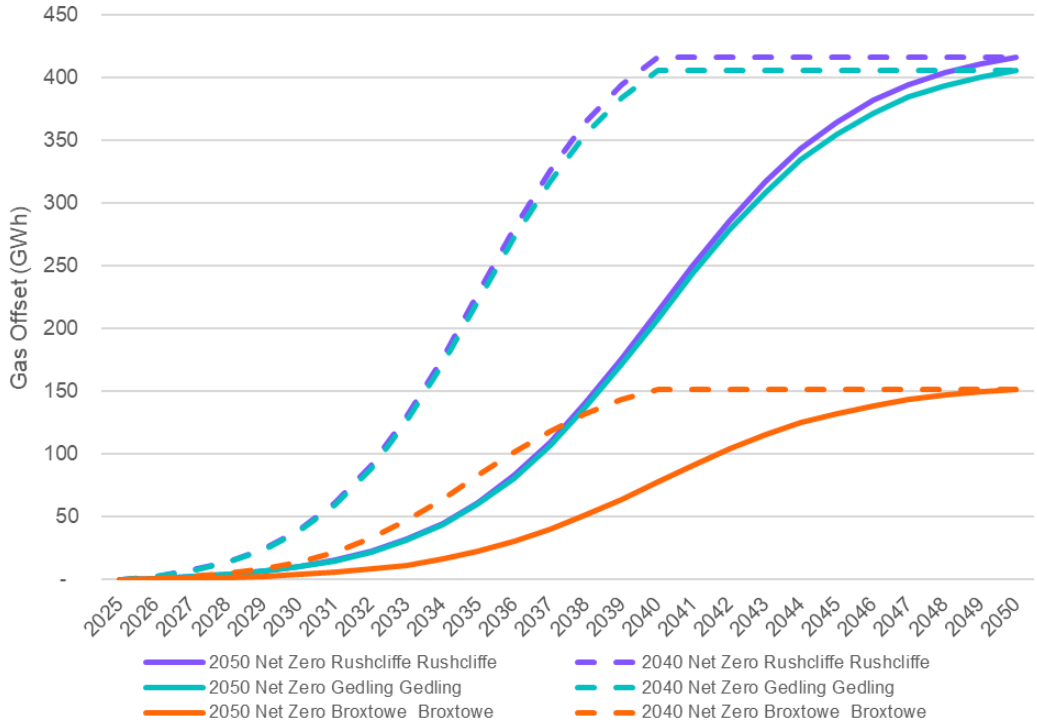
All new builds are assumed to have a low carbon heating system, as per the Future Homes Standard, however the challenges lie with existing housing due to space constraints and the need for fabric upgrades in older housing stock as discussed in Section 6.

Heat pumps tend to operate less efficiently in older buildings due to higher heat losses and limited insulation, which hinder thermal comfort during colder weather. Therefore, to ensure optimal performance of heat pumps, it is essential to carry out fabric retrofit improvements early. These upgrades help minimise heat loss, reduce running costs, and support the system in maintaining comfortable indoor temperatures, especially during colder periods.

Space limitations in existing homes (particularly flats and terraced houses) can make heat pump installation challenging, largely due to the need for a compatible hot water cylinder. Social housing providers may be able to install heat pumps alongside the necessary insulation upgrades.

Figure 7.7 illustrates the projected domestic gas savings resulting from heat pump deployment under the 2040 and 2050 decarbonisation scenarios for GBR. In each case, gas savings increase steadily through the late 2020s and 2030s before accelerating sharply in the 2040s as the rate of low-carbon heating installations scales up. The 2040 scenario achieves comparable cumulative savings approximately a decade earlier than the 2050 pathway, underscoring the effect of accelerated deployment on total reductions in gas demand.

Figure 7.7: 2050 and 2040 scenario domestic heat pump gas savings projections



The projections show a consistent pattern across all three boroughs; an initial period of gradual gas displacement followed by a rapid expansion as heat pumps become more prevalent and supporting market conditions strengthen. Although absolute savings differ slightly between areas (reflecting likely variations in housing stock composition, grid readiness, and retrofit uptake) the overall trend is uniform, with heat pump adoption emerging as a key driver of declining natural gas use in the domestic sector.

Collectively, these results highlight the significant contribution that low-carbon heating technologies can make toward local and regional decarbonisation objectives, reinforcing the importance of sustained investment in retrofit support, installer capacity, and grid infrastructure to enable continued growth in heat pump deployment.

7.1.5 Scenarios Overview

Figure 7.8: Annual domestic ASHP installations in preferred scenario

Year	Annual percentage uptake	Gedling Annual uptake	Broxtowe Annual uptake	Rushcliffe Annual uptake
2025	0%	0	0	0
2026	1%	307	122	301
2027	1%	472	188	462
2028	2%	721	287	707
2029	2%	1090	434	1069
2030	4%	1611	641	1579
2031	5%	2314	920	2269
2032	7%	3191	1269	3128
2033	9%	4144	1647	4062
2034	11%	4994	1985	4895
2035	12%	5510	2191	5401
2036	12%	5555	2208	5445
2037	11%	4954	1969	4856
2038	9%	4139	1646	4057
2039	7%	3191	1269	3128
2040	5%	2314	920	2269

The two net zero scenarios developed as part of this LAEP anticipate significantly more installations to take place compared to the Do Nothing, by assuming all homes will have a low-carbon heating system by the net zero year.

The 2040 and 2050 scenarios assume a full electrification of space heating, with no hybrid heat pump installations. The scenarios assumes a relatively consistent, steady uptake of heat pumps, which accelerates slightly in the mid-2030s in all three borough councils. The annual uptake rates for the 2040 Net Zero scenario are set out in Figure 7.8.

All new builds are assumed to have a low carbon heating system, as per the Future Homes Standard, however the challenges lie with existing housing due to space constraints and the need for fabric upgrades in older housing stock as discussed in Section 6.

Heat pumps operate less efficiently in older buildings as they incur higher heat losses and may struggle to maintain thermal comfort in cold weather conditions. Therefore, it is important that fabric retrofit improvements are undertaken in such buildings as soon as possible to reduce the costs incurred by running them as well as achieving the necessary COP level for adequate thermal comfort.

Overall, 105,038 domestic installations are modelled as required across the region by the net zero year. This is expected to reduce 972GWh of gas consumption and result in 378GWh of electricity consumption.

Space constraints in existing housing, particularly flats and terraced houses, present challenges to heat pump installation due to the required hot water cylinder to go alongside it. Social housing providers may be able to install heat pumps alongside the necessary insulation upgrades.

Regulatory changes to permitted development rights for ASHPs remove barriers like the 1-metre boundary rule for ASHP, which also make installations easier for more homes and can be expected to boost uptake significantly alongside the planned phase-out of fossil fuel boilers by 2035.

Collectively, these results highlight the significant contribution that low-carbon heating technologies can make toward local and regional decarbonisation objectives, reinforcing the importance of sustained investment in retrofit support, installer capacity, and grid infrastructure to enable continued growth in heat pump deployment.

7.1.6 Modelled Interventions

The technologies considered for heating decarbonisation are set out in Table 7.1. Of these, air source heat pumps (ASHPs) are the most viable and economical option going forward due to grid decarbonisation and their high efficiencies, providing heat for the building while meeting the net zero targets.

In comparison, GSHPs offer slightly higher efficiencies than ASHPs but come with higher upfront costs and require sufficient outdoor space for ground loops. Direct electric heating, though simple to install, is far less efficient and results in higher running costs and electricity demand. Finally, district heat networks can provide low-carbon heat in dense urban areas or large developments but are generally less cost-effective or practical for dispersed and rural housing.

ASHPs are electrically powered and use refrigerant to extract low grade heat from the air, which is then upgraded using compression. The resulting heat is then transferred to a wet central heating system through a plate heat exchange. The efficiency of a heat pump is known as Coefficient of Performance (COP) and measures the heat output in kWh of heat produced per kWh of electricity used (i.e., a system that produces 3kWh of heat per kWh of electricity has a CoP of 3). In our modelling, anticipated demand for ASHPs was represented by the building's new electrical consumption for space heating and DHW, with an assumed COP of 2.7.

Table 7.1: Modelled Interventions

Technology	Description
Fossil Fuel Boiler	Heating technology that combusts fossil fuels to heat water for space heating and DHW demands. Most of these installations currently in the County use natural gas as the fuel source, although there are some using LPG and Oil in the off-gas grid postcodes. This is the most common heating system for domestic buildings in GBR.
Direct Electric	This category of heating technologies includes electric boiler, electric storage heaters, electric heat batteries and other direct electric technologies. They are typically cheaper to install than heat pumps, but more costly to run due to their lower efficiency. Any home currently with this technology is assumed to keep it in all scenarios. Some homeowners and landlords may opt to install one of these technologies instead of a heat pump.
Air Source Heat Pump (ASHP)	Electrical heating system that takes heat from the ambient air outside and delivers it internally, consuming electricity. This technology typically has significantly higher efficiencies compared to direct electric or fossil fuel boilers, of between 2.5 and 3.0. All heat pump uptake is assumed to be air source, unless otherwise specified.
District Heat Network Connection	Some buildings in GBR will likely be able to decarbonise their heat supply through connecting to a district heat network, instead of installing their own low carbon heating system. District heat networks supply heat to buildings via hot water in underground pipes, from a centralised plant. See Section 7.3 or more details.

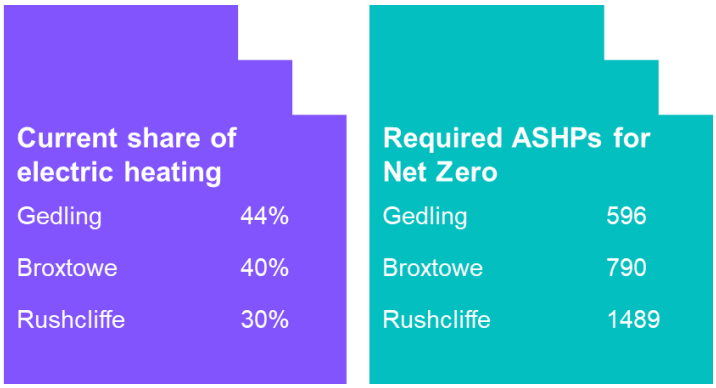
Technology	Description
Hydrogen Boilers	Similar to a fossil fuel boiler but provides heat through burning hydrogen. If this hydrogen is considered 'green' (created via renewables) or 'blue' (created via carbon capture and storage of fossil fuel combustion) then it can be considered low carbon. This heating technology has not been considered for the GBR LAEP, due to hydrogen for space heating not being considered viable as part of this programme, however it should be noted that potential industrial clusters that have been identified as having hydrogen as a possible alternative fuel source.

ASHPs are identified as the most viable and economical low-carbon heating option for the majority of homes within the GBR area. Their suitability reflects a combination of factors including:

- Continued decarbonisation of the national electricity grid,
- High seasonal efficiencies,
- Lower capital costs,
- Installation complexity compared with other low-carbon technologies.

ASHPs can be retrofitted to a broad range of existing property types, making them a scalable solution for widespread domestic decarbonisation.

7.2 Non-Domestic Sector

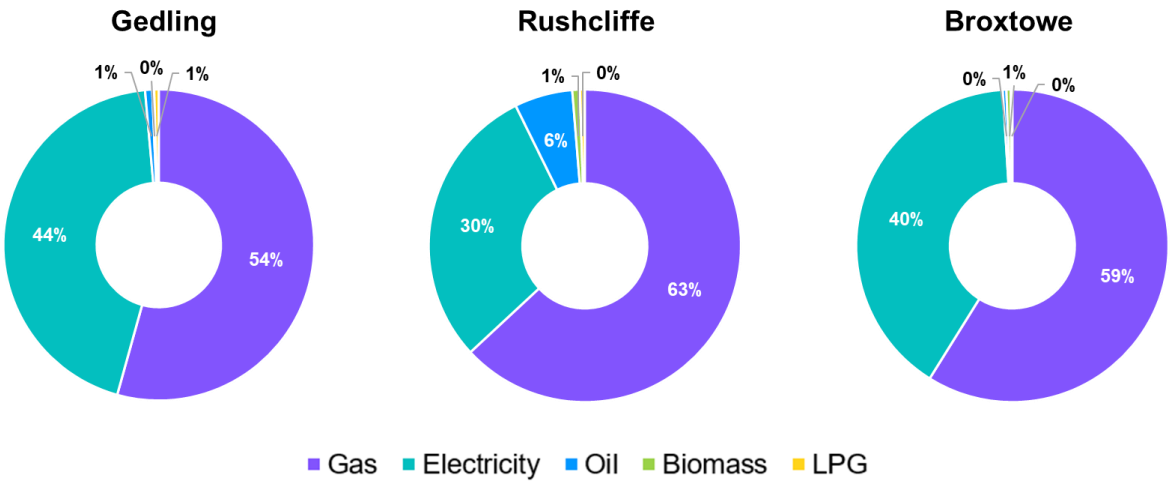


7.2.1 Existing System

In comparison to the domestic sector, there is an equal split between the heating fuel types in place in non-domestic properties in Gedling, Broxtowe and Rushcliffe, as shown in Figure 7.9. Around 54-63% of properties utilise natural gas for space heating and hot water, with 30-44% of properties use electricity for heating. breaks down heating fuel use by across Gedling, Broxtowe and Rushcliffe.

In comparison to the domestic sector, there is an equal split between the heating fuel types in place in non-domestic properties in Gedling, Broxtowe and Rushcliffe, as shown in Figure 7.9. Around 54-63% of properties utilise natural gas for space heating and hot water, with 30-44% of properties use electricity for heating. breaks down heating fuel use by across Gedling, Broxtowe and Rushcliffe.

Figure 7.9: Non-Domestic Heating Split by Fuel type for Gedling, Broxtowe and Rushcliffe (%)



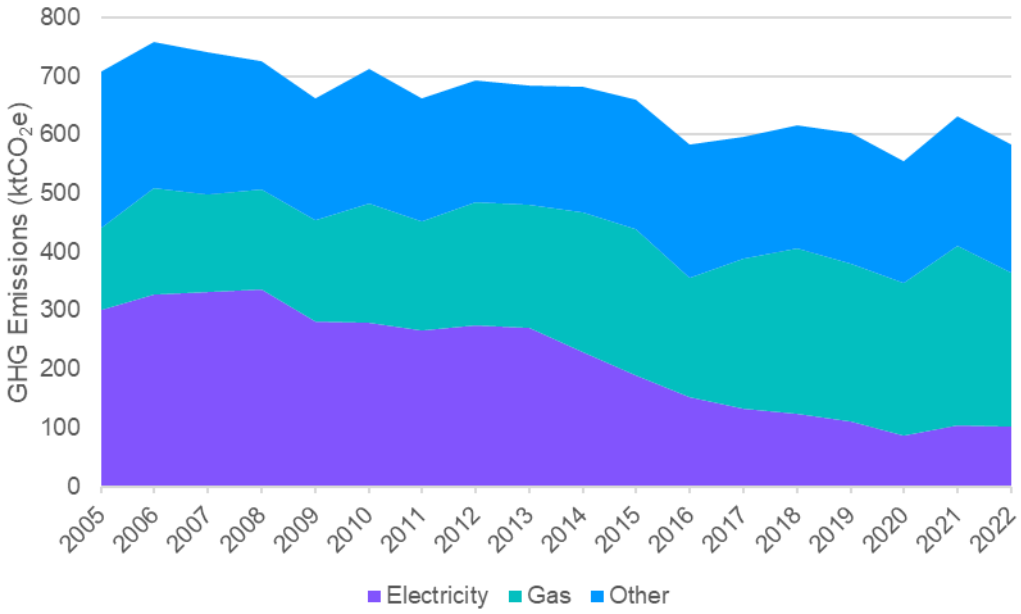
The electrically heated properties are considered to have low carbon heating systems, identifying only half of the properties require replacement of their heating systems.

There is also an additional proportion of properties using oil, liquefied petroleum gas (LPG), or biomass for heating, grouped under the 'other' category, with only 4.3% of properties currently relying on these sources which will need to transition to a decarbonised heat source.

A further breakdown of the heating fuel split between each local authority is displayed in Figure 7.9, identifying each area utilises a similar proportion of each heating fuel within their non-domestic buildings. Rushcliffe has the most unique fuel split with the most usage of the fuels in the 'Others' category of 7%, as well as the lowest reliance of electricity, accounting for only 30% of its total heating fuel.

Figure 7.10 outlines the historical carbon emissions associated within the non-domestic sector across Gedling, Broxtowe and Rushcliffe area, including emissions from industrial, commercial, and public sector activities. Historically, electricity consumption accounted for the largest share of non-domestic emissions, however, these have declined sharply since 2013 due to the progressive decarbonisation of the national electricity grid through renewable integration and improved energy efficiency within the commercial and public estate.

Figure 7.10: Non-Domestic Historical Carbon Emissions Breakdown for Gedling, Broxtowe and Rushcliffe ($ktCO_2e$)



Source: UK local authority and regional greenhouse gas emissions statistics, 2005 to 2022 - GOV.UK

In contrast, emissions from natural gas have reduced more gradually, reflecting the continued reliance on gas-fired heating systems across much of the industrial and commercial building stock. Other fuels now contribute only a small proportion of total non-domestic emissions, following a long-term shift away from high-carbon fuels.

As of 2023, electricity use accounted for approximately 370.3 $ktCO_2e$, natural gas for 370.2 $ktCO_2e$, and other fuels for 285.2 $ktCO_2e$ across the area. Overall, non-domestic emissions have fallen substantially since 2005, driven by cleaner grid electricity, greater uptake of energy efficiency and process efficiency measures, and improved building management systems. Nevertheless, natural gas remains the single largest source of direct emissions in the non-domestic sector, underscoring the importance of decarbonising building heat, expanding low-carbon technologies such as heat pumps and heat networks, and supporting efficiency upgrades in commercial and industrial facilities.

Gedling shows a consistent decline in non-domestic emissions, with a particularly sharp reduction in electricity-related emissions. The borough's relatively modern commercial developments and regeneration projects may have contributed to lower overall emissions intensity. While natural gas remains the dominant source of direct emissions, its share is lower than in Broxtowe and Rushcliffe, suggesting early and proactive progress in transitioning to low-carbon heating systems. This reflects national grid decarbonisation and is locally supported by targeted interventions in council-owned buildings. Indeed, the Carbon Management Strategy 2021–2030 outlines over 100 targeted actions to reduce emissions from council operations with a significant focus on non-domestic buildings[38]. The borough's planning guidance also encourages low-carbon technologies in new commercial developments.

Broxtowe's non-domestic emissions have declined steadily. The borough's emissions profile reflects its mixed building stock, including older industrial premises and newer commercial developments. Broxtowe has adopted a Reduction of Carbon in New Development Supplementary Planning Document[39], which mandates passive design and low-carbon heating systems in new non-domestic

[38] Gedling Borough Council, *Carbon Management Strategy 2021–2030* (Gedling: Gedling Borough Council, 2021).

[39] Broxtowe Borough Council, *Reduction of Carbon in New Development: Supplementary Planning Document (SPD)* (Broxtowe: Broxtowe Borough Council, 2020)

developments. These measures have supported a steady pace of reduction, reflecting consistent improvements in building performance and planning policy.

Rushcliffe retains the highest non-domestic emissions among the three boroughs, reflecting its legacy of established industrial and commercial premises. The pace of transition to low-carbon heating has been slower, but recent initiatives mark a shift. The Low Carbon and Sustainable Design Supplementary Planning Document[40] sets out planning guidance for zero-carbon buildings, applicable to both commercial and employment developments. Additionally, Rushcliffe offers Low Carbon Grants[41] to SMEs to support upgrades such as smart heating controls and insulation.

7.2.2 Scenarios Overview

Building on the approach applied to the domestic sector (see Section 7.1), the non-domestic modelling adopts consistent assumptions on technology performance, uptake rates and policy influences, while incorporating adjustments to reflect the differing characteristics of commercial, industrial and public buildings. ASHPs have been identified as the most feasible low-carbon heating option across the non-domestic stock, owing to their modular scalability, lower spatial requirements, and simpler installation compared with ground source systems.

Many non-domestic buildings also benefit from suitable external areas such as rooftops, service yards and plant enclosures that can accommodate ASHP units without major disruption. In addition, their higher and more consistent heating loads allow larger-capacity ASHP systems to operate efficiently and deliver substantial energy savings at scale. These assumptions have been applied consistently across the 2040 and 2050 scenarios.

The net zero scenarios assume a reduction in the total number of non-domestic properties using other types of electric heating, assuming that many will transition to heat pumps as the technology matures and funding becomes available.

[40] Rushcliffe Borough Council, *Low Carbon & Sustainable Design Supplementary Planning Document (SPD)* (Rushcliffe: Rushcliffe Borough Council, 2022

[41] Rushcliffe Borough Council, *Energy Efficiency, Grants and Renewables* (Rushcliffe: Rushcliffe Borough Council, 2025).

Figure 7.11: Annual installation of Non-Domestic ASHP in preferred scenario

Year	Annual percentage uptake	Gedling	Broxtowe	Rushcliffe
		Annual uptake	Annual uptake	Annual uptake
2025	0%	0	0	0
2026	1%	4	5	10
2027	1%	6	8	16
2028	2%	10	13	24
2029	2%	15	19	36
2030	4%	22	29	54
2031	5%	31	41	77
2032	7%	43	57	107
2033	9%	55	74	139
2034	11%	67	89	167
2035	12%	74	98	184
2036	12%	74	99	186
2037	11%	66	88	166
2038	9%	55	73	138
2039	7%	43	57	107
2040	5%	31	41	77

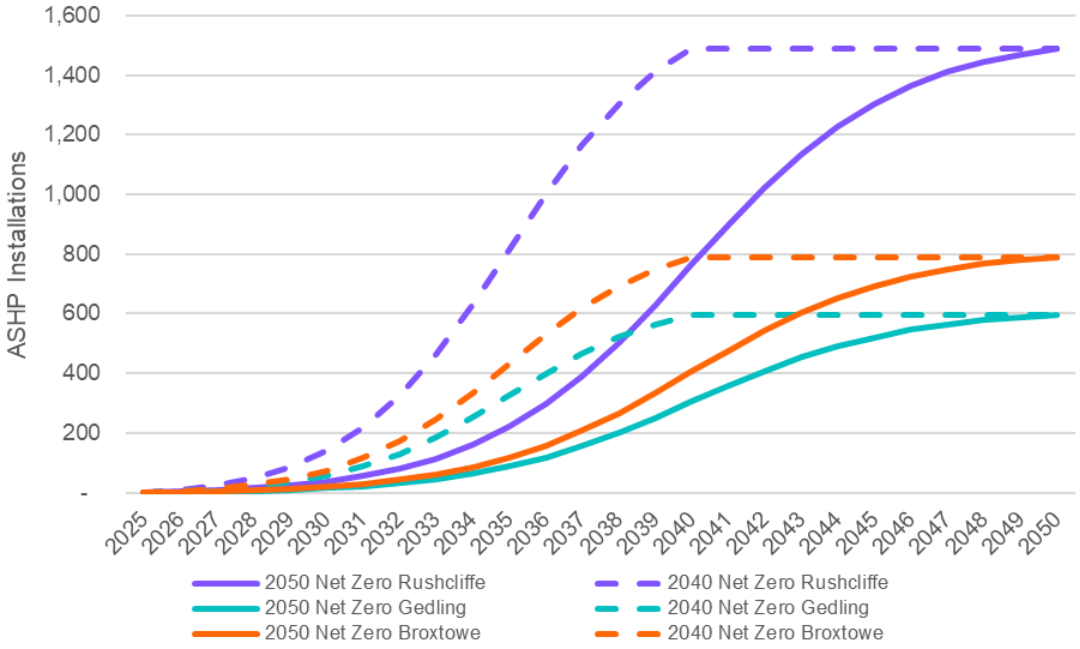
This is based on the replacement rate of boilers with a 15-20 year life span, using historic ASHP installation data to inform the rate at which heat pumps would be installed. Efficiency Assumption is 85% for gas boilers and overall CAPEX for boilers is £2–5k, and ASHPs (£10–15k). As heat pump technology improves and installation costs fall, larger scale heat pumps will become more accessible and cost effective which some non-domestic users and businesses may be suited in communal form.

As heat pump technology improves and installation costs fall, larger scale heat pumps will become more accessible and cost effective which some non-domestic users and businesses may be suited to apply in a shared system.

Overall, the net zero scenarios require 2,875 regional non-domestic ASHP installations, resulting in reduced gas demand of 227 GWh, and additional electricity demand of 71GWh. The 2040 pathway delivers substantial cumulative gas savings earlier than the 2050 scenario, reflecting faster adoption under more ambitious decarbonisation timelines. Differences between boroughs largely stem from variations in building stock, heating demand intensity and retrofit potential, but the overall trend remains consistent.

It is critical financial support is available for more non-domestic buildings which already have good capability for heat pump use, to enable these buildings to upgrade their fabric to be able to quickly adopt heat pump technology.

Figure 7.12: 2050 and 2040 scenario for non-domestic heat pump uptake projections



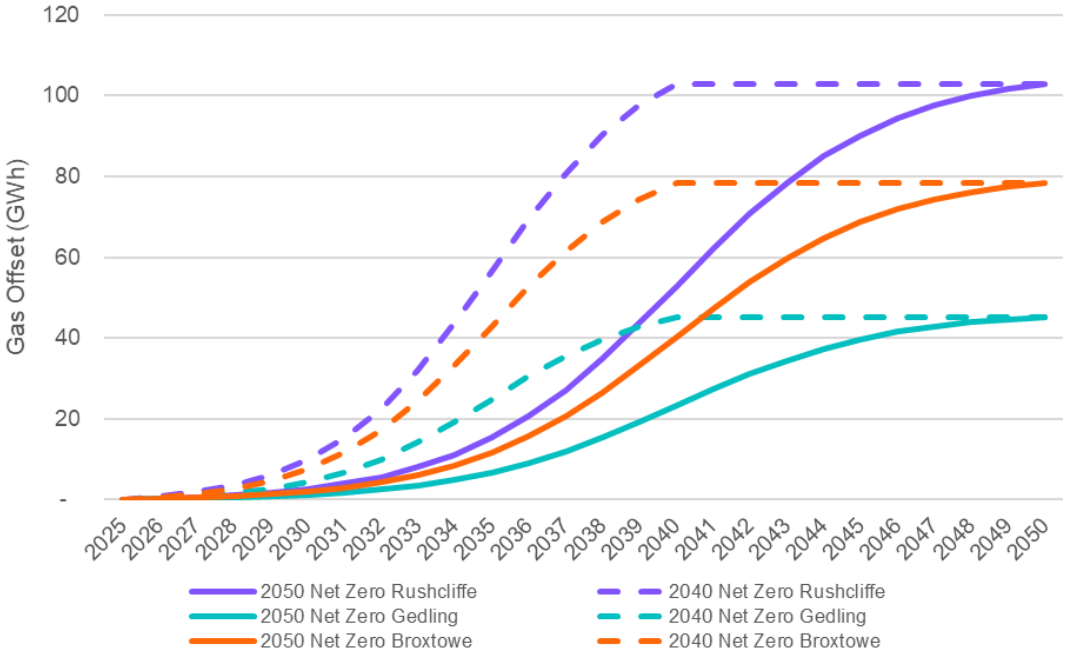
The non-domestic 2040 and 2050 scenarios assume full electrification of heating within commercial, industrial, and public sector buildings, with no hybrid systems retained beyond 2035. These projections represent the transition towards low-carbon heat in the service sector across GBR. Figure 7.11 shows the projected uptake of non-domestic heat pumps for GBR respectively, reflecting an initial steady rate of growth through the late 2020s and early 2030s, followed by a rapid increase in installations during the 2040s as policy support, technological maturity, and private investment accelerate deployment.

The 2040 scenario achieves near-complete uptake around a decade earlier than the 2050 pathway, demonstrating the impact of earlier intervention through national and local decarbonisation funding programmes. Key enablers have included the Industrial Energy Transformation Fund (IETF) for industrial sites, and the Energy Company Obligation for smaller non-domestic premises. The former Public Sector Decarbonisation Scheme (PSDS) would have been a key enabler for public buildings however this is now retired so a new mechanism must be found for this. The projections highlight the growing role of large commercial and public sector buildings in driving the transition, supported by corporate net zero commitments and local authority climate strategies.

Both pathways indicate that widespread non-domestic heat pump deployment will be essential to achieving borough-wide net zero targets, complementing domestic electrification and delivering substantial reductions in natural gas consumption across all three local authority areas.

The non-domestic gas savings projections indicate a clear reduction in fossil fuel consumption across GBR, driven by the progressive replacement of gas-based heating systems with electric heat pumps. As shown in Figure 7.12, both the 2040 and 2050 scenarios for GBR, respectively, exhibit a steady decline in gas demand through the late 2020s and 2030s, followed by a sharp acceleration once large-scale retrofit and installation programmes take effect.

Figure 7.13: 2050 and 2040 scenario domestic heat pump gas savings projections



The 2040 pathway delivers substantial cumulative gas savings earlier than the 2050 scenario, reflecting faster adoption under more ambitious decarbonisation timelines. The differences between area's projected gas savings stems from variations in building stock, heating demand intensity and retrofit potential, but the overall trend remains consistent - progressive reductions in non-domestic gas use as low-carbon heating scales up.

Overall, the projections highlight the significant volume of gas displaced from the non-domestic sector under both pathways. Early and widespread uptake of heat pumps in the 2040 scenario achieves deeper savings sooner, while the 2050 pathway reaches similar levels over a longer period, underscoring the cumulative value of sustained decarbonisation across commercial, industrial and public buildings.

It is essential that financial support mechanisms are available to help non-domestic buildings with good potential for heat pump installation to undertake the necessary fabric upgrades, enabling faster and more effective adoption of low-carbon heating technologies.

Buildings located outside potential district heat network zones have been identified as likely candidates for heat pumps. Those currently using older or less efficient electric systems may require additional improvements to ensure compatibility and optimal performance.

7.3 District Heating

At present, there are no operational large-scale authority-wide district heat networks any of the three boroughs. Heat provision across the area is dominated by individual gas boilers, with limited deployment of communal systems. This reliance on decentralised fossil fuel heating remains a key driver of local carbon emissions and contributes to fuel cost volatility.

Despite its larger population and proximity to urban centres, Rushcliffe presents limited opportunities for heat network deployment due to its predominantly rural settlement pattern and dispersed housing stock. The borough is characterised by a high proportion of villages and low-density developments, thus presenting limited opportunities for anchor loads with West Bridgford being the only distinctly

urban area. This spatial distribution significantly reduces the feasibility of district-scale heat networks, which rely on dense clusters of heat demand to be economically viable.

As discussed, Rushcliffe's strong connectivity to the gas grid and relatively low number of off-gas properties has historically supported widespread use of individual gas boilers. While this infrastructure has contributed to a uniform reliance on gas heating, and the highest residual gas emissions among the three areas, it also presents a clear opportunity for targeted decarbonisation. Given this context, it is more appropriate to focus on low-carbon heating options tailored to individual properties particularly through the maximised deployment of ASHP for domestic buildings. This approach aligns with the borough's housing typology and offers a scalable pathway to decarbonisation, especially when paired with insulation upgrades and fabric first retrofit strategies. Future opportunities may emerge through targeted zoning or public sector decarbonisation, but these are likely to be site-specific rather than borough-wide.

Several other locations within Gedling and Broxtowe however have been assessed against key heat network feasibility criteria. Table 7, introduces and summaries the potential heat network opportunities that have then been further expanded on and included within the decarbonised heat modelling.

Table 7.2: Summary Table Potential Heat Network Zones

Zone	Low Carbon Heat Source	Anchor Loads	Key Constraints / Notes	Included in LAEP?
Broxtowe – Beeston	Yes	Yes	Using the adjacent Severn Trent water treatment facility as a heat source, there is an opportunity for a network starting at this location to serve Beeston Rylands as well as the Beeston industrial site. However, a key constraint to the growth of such a network would be the rail line immediately to the north of the site.	Yes
Broxtowe – Eastwood	Yes	Yes	Existing feasibility has been undertaken to assess the potential for a mine water heat source network to provide heat within Eastwood. The Mining Remediation Authority have conducted the investigation and made recommendations for a Phase 2 study.	Yes
Gedling - Colwick	No	Yes	Through the combined approach, between Colwick and Stoke Bardolph, an opportunity for a heat network has been identified to serve the areas and possibly extend into Carlton. The main barrier to this network, again, is the main railway line that branches between Colwick and Carlton.	Yes (combined zone)
Gedling – Stoke Bardolph	**Yes**	**Yes**		

7.3.1 Emerging Heat Network Developments

7.3.1.1 Broxtowe: Eastwood Mine-Water Heat Network

Broxtowe Borough Council, in partnership with the Mining Remediation Authority, completed a Phase 1 feasibility study in September 2025 to assess the potential for a mine-water-sourced low-carbon heat network in Eastwood. The scheme proposes to repurpose flooded coal mine workings beneath the town to supply sustainable heat to key public-sector buildings, with potential future expansion to commercial and residential users.

Eastwood is located above 11 worked coal seams, with depths ranging from near surface to approximately 360 metres. The majority of these seams are flooded, which is a prerequisite for mine water heat extraction.

Mine water temperatures are estimated between 11°C and 17°C, based on depth and data from nearby sites. The proposed system would:

- Abstract ambient temperature mine water via boreholes,
- Upgrade heat using centralised water-source heat pumps to supply temperatures of 50 to 60°C,
- Distribute heat through a district-scale network to nearby domestic and non-domestic buildings,
- Re-inject cooled water underground, maintaining a closed-loop system.

Water quality data suggests elevated iron content and potentially brackish to saline conditions, which will require appropriate treatment and system design.

The study identified six cluster zones around key public buildings with strong anchor load potential:

1. Nottingham Road: Wellington Court, Eastwood Library, Lawrence View Primary School
2. Beauvale: Greasley Beauvale Primary School, Greasley Sports & Community Centre
3. Church Street: Eastwood Primary Care Centre, Springbank Primary School
4. Hall Park: Hall Park Academy, Meadowbank Way Industrial Estate
5. Coronation Park: Florence Nightingale Academy, Eastwood Community FC, Eastwood Fire Station
6. Commercial Zone: Additional commercial properties

Combined, these clusters represent a first-phase heat demand of approximately 30–40 GWh/year, equivalent to a continuous thermal load of around 4 MW. Future phases could double this output as more connections are added.

The indicative capital investment required for Phase 1 of the Eastwood Mine-Water Heat Network is estimated to be between £15 million and £30 million, covering the production and re-injection boreholes, the central energy centre, and the initial distribution network infrastructure. Individual boreholes are expected to cost between £50,000 and £200,000 each, depending on the depth (ranging from 50 to 265 metres) and the geological conditions encountered during drilling.

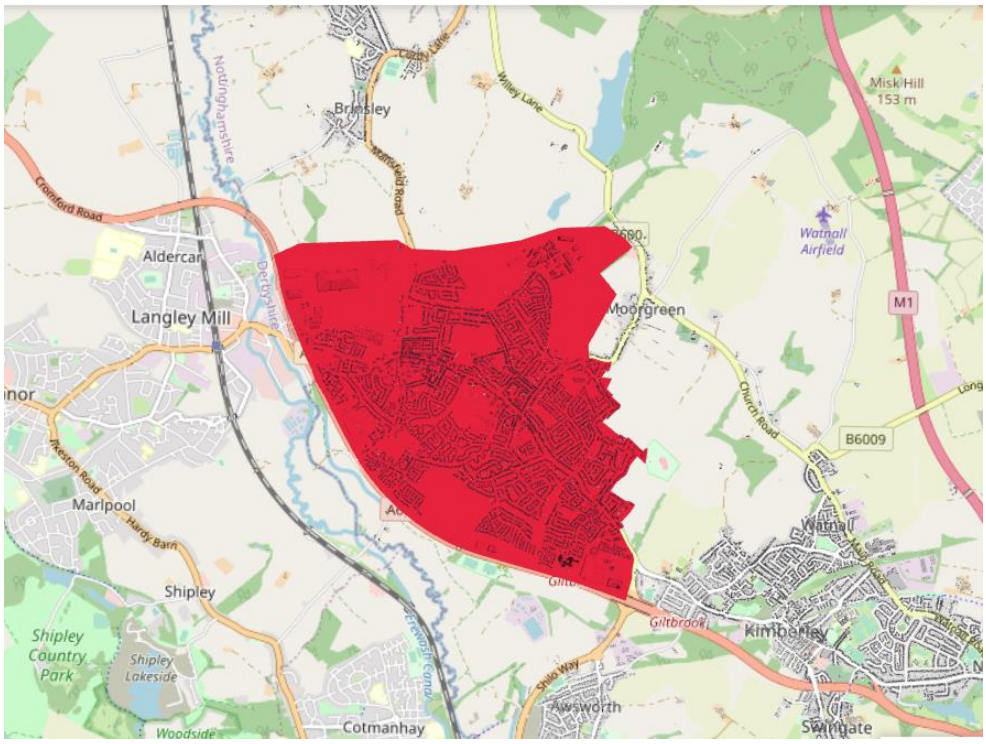
To support delivery, several funding mechanisms are being explored. These include the Green Heat Network Fund (GHNF), which provides capital support for low-carbon heat infrastructure, as well as potential public-private partnerships that could leverage investment and operational expertise. Additional funding may also be sourced from local and regional regeneration programmes, aligning the project with broader economic and environmental objectives in Broxtowe.

This scheme has been considered within the LAEP as a route to decarbonised heat through district heating growth. This network will likely represent a more cost-effective heat decarbonisation solution in this area than decentralised air source heat pumps, but development will depend on detailed feasibility.

Notably, in Gedling and Broxtowe community energy groups are supportive of the use of mine water district heating networks because of the knowledge of the many existing and disused mining shafts in the region, some of which are adjacent to domestic properties and filled with water.

Figure 7.14 presents the indicative district heating zone in Eastwood. This map highlights areas with concentrated heat demand and suitable building types for network deployment, providing a high-level perspective on where initial development could be most viable based on demand density and anchor load distribution. The network will initially focus on key anchor loads such as public sector institutions and large industrial facilities, before expanding to serve private sector and domestic housing customers. Further refinement and feasibility studies should be completed to further verify its feasibility.

Figure 7.14: Map of proposed Eastwood Heat Network zone



7.3.1.2 Broxtowe: Beeston District Heating Network

The second locations within Broxtowe to be identified against key feasibility criteria, including the presence of low-carbon heat sources, suitable anchor loads, and geographic constraints, was Beeston. As summarised in Table 7.2, the potentially viable zone could use Severn Trent's water treatment facility as a heat source and provide heat to the industrial site in Beeston and the residential area around Beeston Rylands. The area offers strong industrial anchor loads, however the expansion of the network is constrained by the presence of the main railway line, which poses a geographical and commercial challenge in crossing. Overcoming this crossing would open up connection to further residential, commercial and institutional connections.

The future of this potential heat network would likely require the construction of an energy centre integrating large-scale heat pumps, thermal storage, pumping equipment and flexible backup generation to ensure reliability and cost optimisation. Development will require close collaboration between local authorities, developers, and energy providers to align planning policy, zoning, and investment strategies, especially as the delivery of heat as a service is new for the UK market and models of ownership, operation and maintenance are often complex and can involve many parties.

Figure 7.15 presents the indicative district heating zone in Beeston (lower red zone), with Eastwood shown in the north (upper red zone). This map highlights areas with concentrated heat demand and suitable building types for network deployment, providing a high-level perspective on where initial development could be most viable based on demand density and anchor load distribution. Further refinement and feasibility studies should be completed.

Figure 7.15: Map of Broxtowe and potential Beeston Heat Network zone



7.3.1.3 Gedling: Stoke Bardolph and Colwick District Heating Network

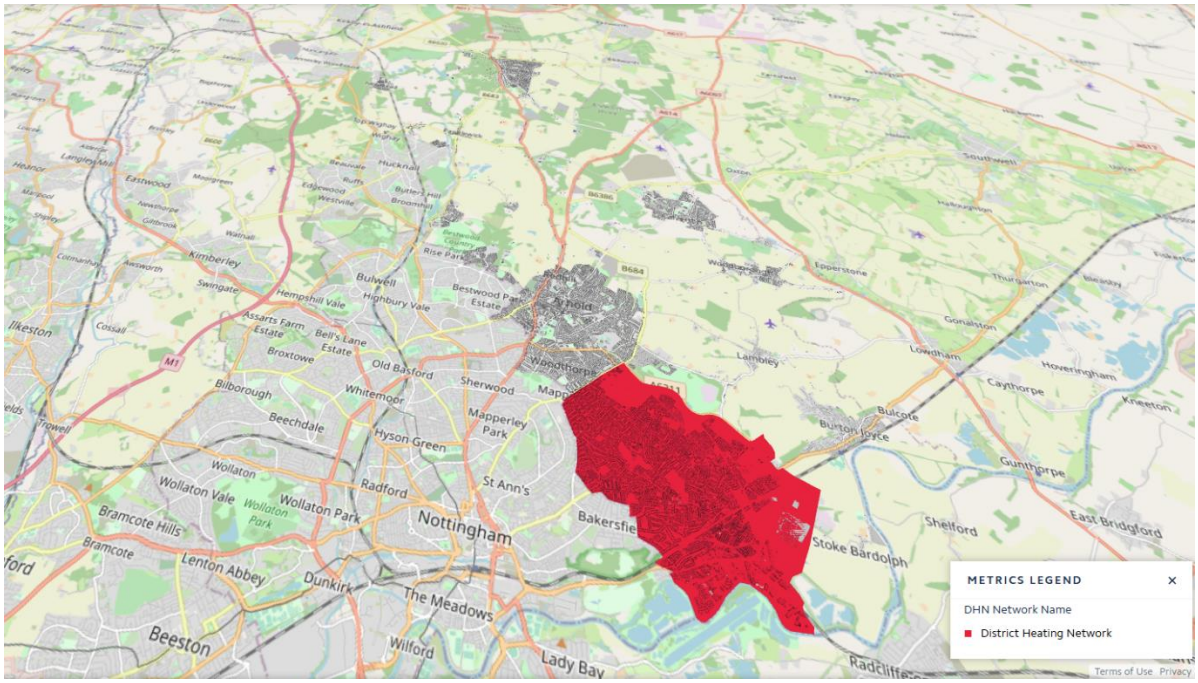
The final location identified against key feasibility criteria was the combined areas of Colwick and Stoke Bardolph in Gedling. The combined location benefits from a low-carbon heat source from Severn Trent's water treatment facility to the northwest of Stoke Bardolph. There are suitable industrial and commercial anchor loads, as well as close by residential areas that could be connected. However, similarly to Beeston, the location faces some geographic constraints with its proximity to a branching railway line. This can be perceived as a commercial constraint to a network as this often involves complex land rights negotiations.

The future of this heat network would likely require the construction of an energy centre integrating large-scale heat pumps to ensure the decarbonised heat source, thermal storage, pumping equipment and flexible backup generation to ensure reliability and cost optimisation. Development will require close collaboration between local authorities, developers, and energy providers to align planning policy, zoning, and investment strategies, especially as the delivery of heat as a service is new for the UK market and models of ownership, operation and maintenance are often complex and can involve many parties.

Figure 7.16Figure 7.16 presents the indicative district heating zone in Colwick and Stoke Bardolph. This map highlights areas with concentrated heat demand and suitable building types for network deployment, providing a high-level perspective on where initial development could be most viable based on demand density and anchor load distribution. Further refinement and feasibility studies should be completed.

Notably, it can be seen that the zone extends northwest towards the existing Enviroenergy Heat Network in St Ann's, Nottingham. A connection between the potential network and this existing network would provide greater diversity across a large heat network but feasibility and actual connection is not likely to occur in the near future.

Figure 7.16: Map of proposed Stoke Bardolph & Colwick Heat Network Zone



7.3.2 Policy and Market Drivers

The forthcoming UK Heat Network Zoning (HNZ) Regulations, set for rollout in 2026 under the Energy Act 2023, will be a key catalyst for local heat network delivery across the GBR area. HNZ will define areas where heat networks represent the lowest-cost decarbonisation pathway, and within these zones certain building types, such as large public, commercial, and multi-residential developments, will be required or strongly encouraged to connect.

For all three local authorities, zoning provides clear spatial and policy signals about where networks are technically and economically viable. Embedding this framework allows the boroughs to align heat-demand mapping, anchor-load identification, and spatial planning policy with designated zones. This integration helps to:

- Direct investment and development activity toward areas with strongest network potential
- Secure anchor connections from public-estate or regeneration sites
- De-risk private-sector investment by demonstrating long-term demand certainty
- Strengthen funding bids to programmes such as the GHNF

Alongside the introduction of national consumer-protection and technical-performance standards, Heat Network Zoning will create a more stable and transparent market for heat network projects. By incorporating these policy mechanisms, Nottinghamshire can ensure that heat networks are developed as part of a coordinated, place-based energy and planning strategy, supporting net-zero targets while enabling predictable, low-carbon heat for communities and businesses.

7.3.3 Next Steps

To fully realise this opportunity, coordinated action will be required across stakeholders most notably in supporting zoning implementation, securing anchor load commitments, and aligning local planning and development policy with heat network rollout. Importantly, however, engaging an energy partner early to support the scoping of the delivery, operation and maintenance of any heat network development is proving to be a sure route to success. Similar approaches are being pursued across city and regional authorities within the UK and are viewed as a derisking heat network solutions.

As heat networks expands, they are anticipated to become a cornerstone of GBR’s sustainable infrastructure, enabling future connections and the integration of additional renewable and low-carbon heat technologies.

8 Industrial Decarbonisation

This section examines the current industrial process loads across the region and models the expected changes in energy sources required to achieve full decarbonisation. Data from Cadent Gas has been used to map existing process loads. The analysis assumes that most low-temperature process loads will transition to electrification, while the majority of high-temperature process loads will require a shift to hydrogen.

8.1 Methodology

To analyse the industrial process loads currently operating across Gedling, Broxtowe and Rushcliffe, metered gas data from Cadent gas was obtained from the government and Gas Distribution Network at a high level. Local knowledge and further investigations were then conducted to derive an approximate view of which organisations were most likely to be the highest gas users in the given areas. This provides information on the gas consumption of each connection to the gas network from a non-domestic building. Across the region, the top 200 non-domestic gas users were selected for further analysis, representing 68% of total non-domestic gas demand. Of these, 22 no. sites are within the area covered by this LAEP, with 10 in Broxtowe, 4 in Gedling and 8 in Rushcliffe.

The primary use of each connection was determined from their Standard Industrial Classification (SIC) code, which is an internal numbering system used by Cadent gas to assign the use of each commercial and industrial connection. A description of the primary uses matched to each code was also provided by Cadent to facilitate this process. Each industrial SIC code present in the GBR area was identified as either low temperature, or high temperature, based on information gathered directly from stakeholders or site owners during one-on-one engagements with high energy users or industrial operators. Where such stakeholder input was unavailable, we made an informed assessment of the degree of heat required for the majority of process loads for that specific industry.

From the above process, the existing low and high temperature process loads throughout GBR were modelled and mapped at MSOA layer. The projected additional electricity and hydrogen demand was then calculating to decarbonise low temperature and high temperature process loads respectively, through phasing out industrial fossil fuel use.

To model the projected changes in energy consumption and the associated carbon emissions for industrial process loads, the analysis assumes that all low-temperature process loads will transition to electrification, while all high-temperature process loads will convert to hydrogen. It is important to note that the low-temperature category includes certain industries that do not currently have cost effective technology available on the market to electrify but likely will within the next ten years or so. The high-temperature category generally refers to processes requiring heat in the range of 150°C to 200°C.

Given the level of data granularity available, the analysis should be considered most representative at the Local Authority level rather than on a site-by-site basis. Further engagement with large industrial energy users will be required over the delivery timeframe of the LAEP in order to better understand their specific requirements for low-carbon energy sources.

8.2 Overview of key industrial sectors

Gedling has a primarily service-based economy, closely integrated with Nottingham, with a large proportion of residents commuting out of the borough for higher-value employment. Professional, scientific and technical services are significant and growing sectors, reflecting a skilled resident workforce and proximity to Nottingham’s office and business services market.

Construction and built environment is the largest sectors by business count and employment growth, linked to housing development and regeneration activity across Greater Nottingham. Retail and local services are concentrated in Arnold, Carlton and Netherfield town centres; largely dominated by

SMEs and community-scale employers. Creative and digital micro-businesses are an emerging but still small sector, supported through local business support programmes and improved digital connectivity.

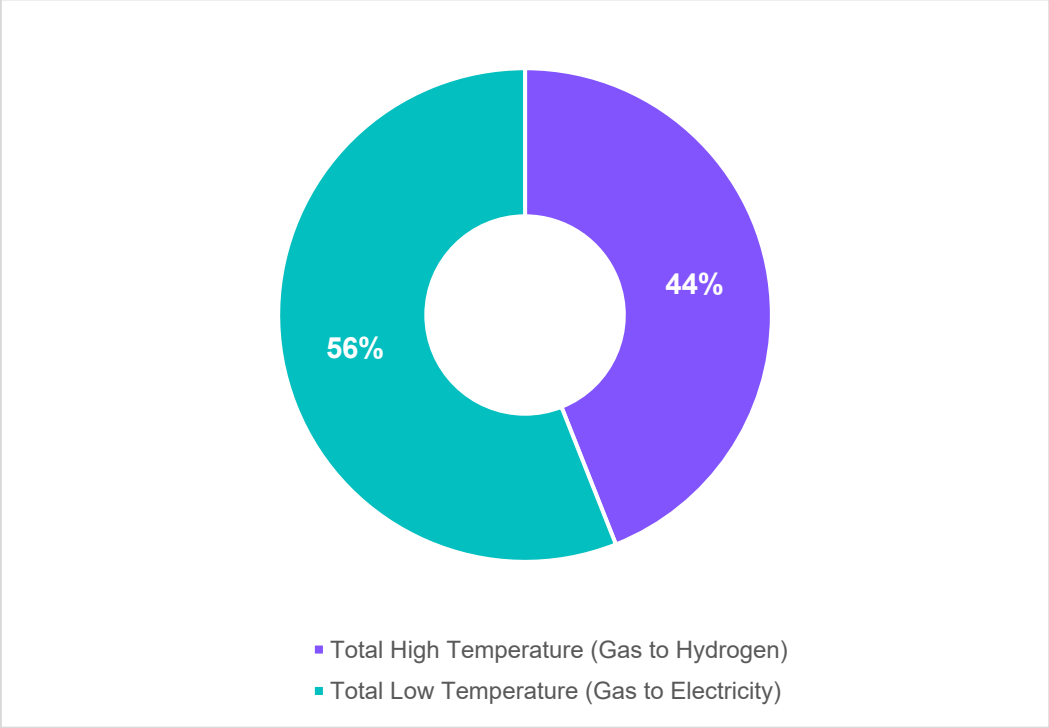
Broxtowe has the most industrially diverse and employment-dense economy of the three boroughs, supported by strong transport links (M1, A52) and established employment sites. Wholesale, retail and logistics are a dominant sector by company numbers and employment, including warehousing and supply-chain businesses located near strategic road corridors. Professional, scientific and technical services are a major contributor to employment growth, linked to the Nottingham, Derby and the East Midlands innovation ecosystem. Construction is a consistently strong sector, supported by regeneration initiatives and demand for industrial and commercial units. Advanced manufacturing and life sciences is smaller in scale but showing growth in medical devices, research tools and specialist manufacturing.

Rushcliffe's economy is high-skill, professional and increasingly knowledge-led, with strong performance indicators and a large commuter population centred on West Bridgford. Professional, scientific and technical services make up the largest sector by business count, reflecting high skill levels and strong links to Nottingham's professional economy. Clean energy and infrastructure is emerging), with future growth potential linked to the redevelopment of the Ratcliffe-on-Soar power station site and wider clean energy ambitions.

High gas consuming organisations such as Saint Gobain and Boots were engaged as part of this LAEP.

8.3 Existing System

Figure 8.1: Breakdown of Process Load by Energy Demand



Source: Mott MacDonald Analysis of metered data from the government and Gas Distribution Network

Figure 8.1 above illustrates the current natural gas consumption for industrial process loads across Gedling, Broxtowe and Rushcliffe, segmented into low-temperature and high-temperature categories.

Notably, high-temperature processes dominate, accounting for 56% of total industrial gas use, while low-temperature processes make up the remaining 44%.

This disproportionate share is largely driven by Gedling, Broxtowe and Rushcliffe's industrial landscape, which includes major energy-intensive operations such as Saint Gobain, Boots HQ, and Ibstock Brick Manufacturing. Together, these industries represent 75% of all non-domestic process load gas consumption in the region.

Given this context, the path to decarbonisation must be tailored to the nature of the thermal demand. High-temperature processes, due to their intensity and technical requirements, are less amenable to electrification and will likely require low-carbon hydrogen as a viable alternative. In contrast, low-temperature processes, which generally involve heating below 100 degrees Celsius are more suitable for electrification, especially with the increasing availability of renewable electricity. This distinction is crucial for developing targeted strategies to reduce industrial emissions in Gedling, Broxtowe and Rushcliffe.

8.4 Decarbonisation Requirements

To model the projected changes in energy consumption and the associated carbon emissions for industrial process loads, the analysis assumes that all low-temperature process loads will transition to electrification, while all high-temperature process loads will convert to hydrogen. It is important to note that the low-temperature category includes certain industries that do not currently have cost effective technology available on the market to electrify but likely will within the next ten years or so. The high-temperature category generally refers to processes requiring heat in the range of 80°C to 200°C.

A profile to project the rate of uptake of fuel switching for process loads was developed using the projections in the UK Government's 7th Carbon Budget scaled down appropriately to Gedling, Broxtowe and Rushcliffe. This profile includes a reduction in the total energy required for process loads due to energy efficiency, of around 6%. Efficiency improvements of electrical systems compared to fossil fuel boilers were also included in the consumption projections for low temperature loads.

The industrial decarbonisation projection from the 7th Carbon Budget included contributions from Carbon Capture and Storage. However, this technology was ruled out for Gedling, Broxtowe and Rushcliffe, as it is generally only suitable for extremely large industrial sites of national-level importance, infrastructurally. Based on the data available, no suitable sites were identified in the area.

The introduction of hydrogen as a significant low-carbon fuel is aligned to the planned timeline of the East Coast Hydrogen pipeline extension into the area, around the mid-2030s, with the opportunity for some conversion to hydrogen prior to this through the use of local delivery. It is important to note that the emissions reductions associated with conversion of processes to hydrogen depends largely on the emissions-intensity of the hydrogen production process. Additionally, hydrogen is in itself a potent greenhouse gas[42], so while it may not produce CO2 emissions in combustion, careful control and monitoring of leakage will be important to any implementation of hydrogen in processes.

The detailed uptake rates and associated demand levels for the 2050 Net Zero scenario are shown in Figure 8.2. Whilst local authorities included within the LAEP preferred the Net Zero by 2040 scenario, it was acknowledged that industrial processes largely fall into the 'hard-to-abate' category, with the means to decarbonise (e.g. East Coast Hydrogen) still in the distant future.

[42] Global warming potential estimates for hydrogen vary but are around 10, meaning that over a 100-year period it would result in approximately 10 times the warming of the same mass of carbon dioxide.

Figure 8.2: Annual conversion rates of process natural gas demand in preferred scenario

Year	Hydrogen		Electrification	
	Annual Percentage Conversion	Annual Conversion (MWh)	Annual Percentage Conversion	Annual Conversion (MWh)
2025	0.00%	0	1%	0
2026	0.00%	4,613	1%	0
2027	0.00%	9,226	2%	0
2028	0.00%	18,452	2%	0
2029	0.00%	27,678	4%	0
2030	2.00%	46,130	6%	0
2031	2.00%	73,808	6%	11,742
2032	2.00%	101,486	6%	23,484
2033	4.00%	129,165	8%	35,227
2034	4.00%	166,069	8%	58,711
2035	4.00%	202,973	8%	82,196
2036	8.00%	239,877	8%	105,680
2037	8.00%	276,781	8%	152,649
2038	8.00%	313,685	8%	199,618
2039	8.00%	350,589	4%	246,587
2040	8.00%	369,041	4%	293,556
2041	8.00%	387,494	4%	340,525
2042	8.00%	405,946	4%	387,494
2043	6.00%	424,398	2%	434,462
2044	6.00%	433,624	2%	469,689
2045	6.00%	442,850	2%	504,916
2046	4.00%	452,076	2%	540,142
2047	4.00%	461,302	0%	563,627
2048	0.00%	461,302	0%	587,111
2049	0.00%	461,302	0%	587,111
2050	0.00%	461,302	0%	587,111

The introduction of hydrogen as a significant low-carbon fuel is aligned to the planned timeline of the East Coast Hydrogen pipeline extension into the area, around the mid-2030s, with the opportunity for some conversion to hydrogen prior to this through the use of local delivery. It is important to note that the emissions reductions associated with conversion of processes to hydrogen depends largely on the emissions-intensity of the hydrogen production process. Additionally, hydrogen is in itself a potent greenhouse gas[43], so while it may not produce CO2 emissions in combustion, careful control and monitoring of leakage will be important to any implementation of hydrogen in processes.

Figure 8.3 shows the projected consumption of gas, electricity and hydrogen for process loads. This follows the previously outlined assumptions. The ratio of hydrogen consumption to electricity consumption in 2050 is higher than the current ratio of high temperature to low temperature process loads, due to the system efficiency improvements when electrifying burners and other processes that previously combusted fuel.

[43] Global warming potential estimates for hydrogen vary but are around 10, meaning that over a 100-year period it would result in approximately 10 times the warming of the same mass of carbon dioxide.

Figure 8.3: Process Load Energy Consumption Projection

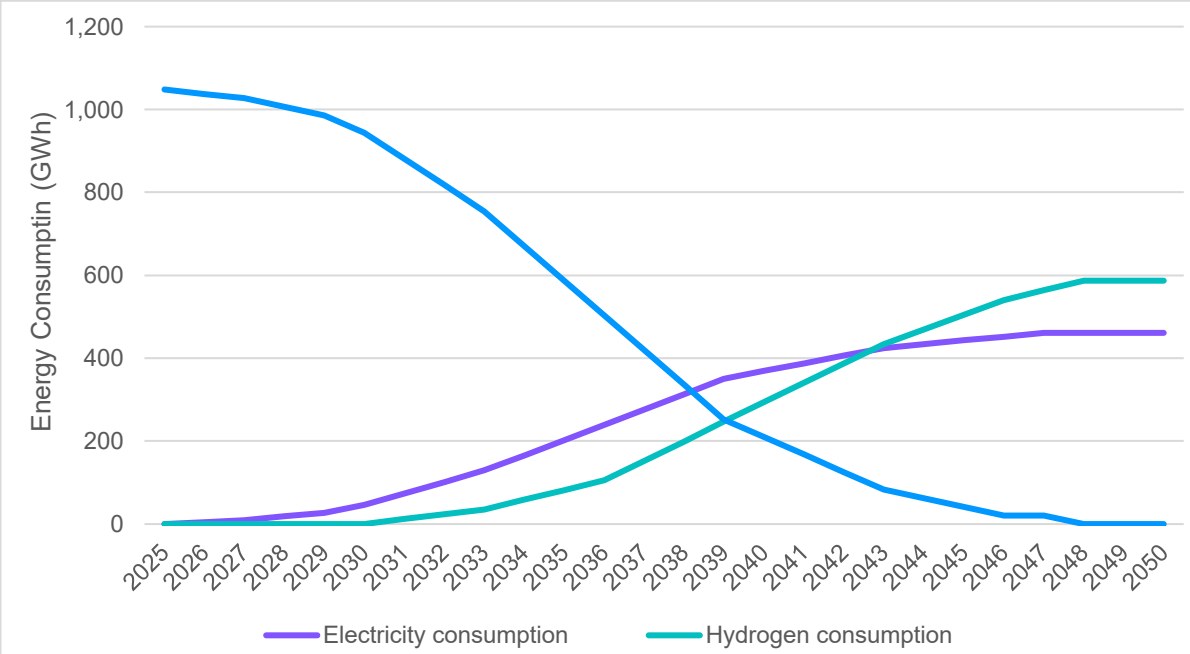
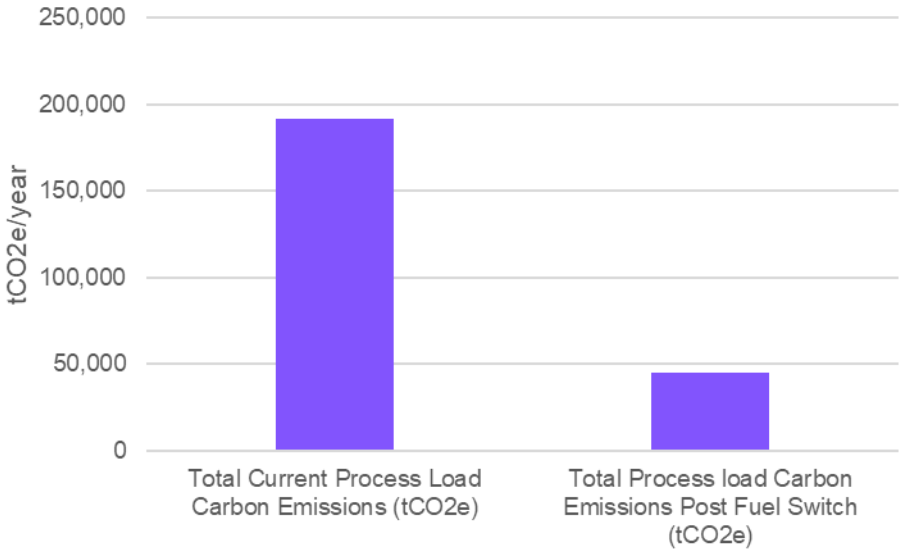


Table 8.1 provides a breakdown of carbon emissions from process loads after the removal of fossil fuels, showing the respective contributions of electricity and hydrogen consumption. Electrifying process loads wherever feasible is essential because electricity generally has a lower carbon intensity than green hydrogen.

Table 8.1: Summary of Process load Emission Post Fuel Switch

Gedling, Broxtowe and Rushcliffe Gas Consumption for Process Use (MWh)	Total Current Process Load Emissions (tCO2e)	Electrical Emissions post fuel switch (tCO2e)	Hydrogen Emissions Post Fuel Switch (tCO2e)	Total Process load Emissions Post Fuel Switch (tCO2e)	Percentage Reduction (%)
1,048,413	191,755	3,248	42,077	45,325	76%

Figure 8.4: Process Load Carbon Emission Post Fuel Switch



To ensure a structured transition, all industrial companies within the Gedling, Broxtowe and Rushcliffe LAEP area should be encouraged to develop comprehensive decarbonisation plans. These plans should be guided to clearly specify when each fossil-fuel-based process will be phased out and identify which alternative energy source, electricity or hydrogen, will replace it. Such planning is critical for achieving cost-effective, reliable, and sustainable industrial decarbonisation.

8.4.1 East Midlands Freeport – Rushcliffe

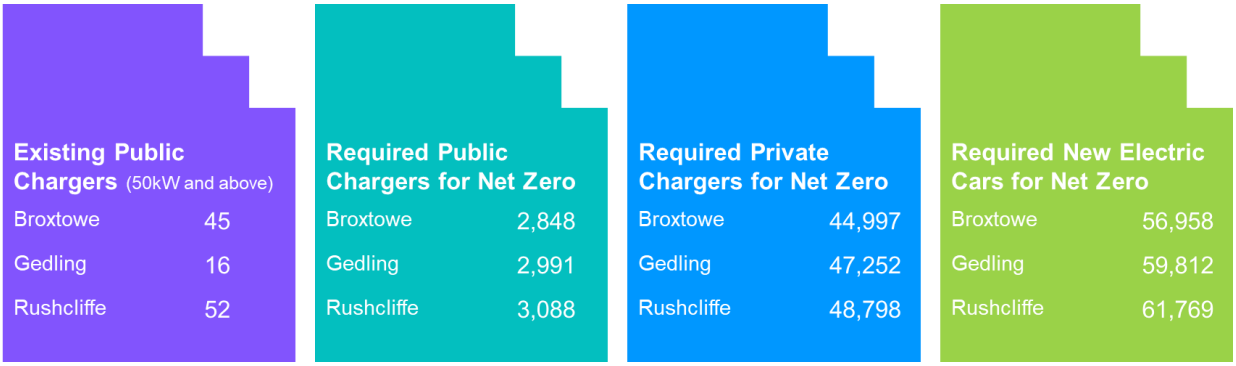
East Midlands Freeport (EMF) is a government-designated growth and innovation zone centred on three tax sites: the East Midlands Airport and Gateway Industrial Cluster (EMAGIC), the Ratcliffe-on-Soar redevelopment area, and the East Midlands Intermodal Park. The Freeport brings together local authorities, landowners, occupiers, the East Midlands Combined County Authority, and national agencies to attract investment, support advanced manufacturing and logistics, and deliver low-carbon infrastructure.

For the D2N2 area, and particularly for Rushcliffe, EMF represents a significant strategic opportunity. The Ratcliffe-on-Soar site is undergoing transition from coal fired power generation to become a major low-carbon energy and innovation hub, with potential roles in hydrogen production, clean power, circular economy activity, and advanced manufacturing. EMF partners have also committed to ambitious Net Zero objectives and annual carbon reporting, supported by investment in enabling infrastructure funded through retained business rates.

The Freeport has the potential to support the Local Area Energy Plan by helping to concentrate low-carbon investment, strengthen regional energy infrastructure, stimulate clean-tech supply chains, and provide a platform for coordinated planning across transport, industry, and energy networks.

9 Electrification of Private Transport

This section outlines the current state of transport emissions across Gedling, Broxtowe and Rushcliffe and the role electrified transport plays in reducing these. This section details the interventions modelled in the net-zero aligned scenarios that prioritise a pathway to electric vehicle decarbonisation.



9.1 Existing System

Currently transport accounts for 34% of GBR's emissions,[44] so supporting the decarbonisation of this sector is crucial in order to enable net zero achievement. The scope of this LAEP (set out in Section 1.3) does not include transport planning, therefore this chapter focuses on the uptake of electric vehicles only as one part of this transport sector decarbonisation plan.

As of 2025, the number of licenced vehicles in GBR is 179,222[45], of which 96% are petrol- or diesel-powered internal combustion engine (ICE) run vehicles which directly release greenhouse gas emissions and pollute the air during operation. The number of licensed vehicles in GBR is expected to increase, primarily driven by car ownership which reflects both population growth and increased mobility demand across the region. Therefore, expanding the current makeup of electric vehicle (EV) ownership to beyond its current level of around 4% is key.

EVs produce zero tailpipe emissions, which contributes to improved local air quality by not emitting the high levels of nitrogen oxides and particulate matter released by internal combustion engine vehicles.

Alongside policy implementation, it must also become easier and more affordable to own or use an electric vehicle. The UK Government's confirmed policy[46] to end the sale of new petrol and diesel cars by 2030, with hybrids allowed until 2035, will accelerate the transition to electric mobility. This policy is expected to drive a significant shift in the fuel makeup of Gedling, Broxtowe and Rushcliffe's vehicle fleet over the coming decades as EV ownership becomes easier and more affordable.

9.2 Local Context

According to Midlands Connect[36], the Midlands could have over 2 million EVs on the road by 2030, representing 32.5% of all vehicles. To support this growth, the region will require 58,997 new public charging points by 2030, equivalent to installing 27 per day, 194 per week, and nearly 9,832 annually.

[44] UK local authority and regional greenhouse gas emissions statistics, 2005 to 2023 - GOV.UK

[45] Vehicle licensing statistics data files - GOV.UK

[46] UK Government; Phasing out the sale of new petrol and diesel cars from 2030 and support for zero emission vehicle (ZEV) transition

EV adoption is projected to rise sharply. Across Gedling, Broxtowe and Rushcliffe, the number of EVs is expected to increase by several hundred percent by 2030, driven by the UK Government's policy to end the sale of new petrol and diesel cars by 2030 (with hybrids allowed until 2035). This transition will require a significant expansion of charging infrastructure.

Current public charge point numbers in the three areas remain limited - Broxtowe has 71.6 publicly available electric vehicle charging devices at all speeds per 100,000 residents, Gedling has 56.6 per 100,000 people, and Rushcliffe leads at 74 chargepoints per 100,000 people. This is lower than the UK average of 113 charging devices per 100,000 people[47]. 34.2% of on-street Gedling households have an EV charger within walking distance, compared to 12.6% of Rushcliffe and 16.2% in Broxtowe[48]. Nonetheless, growth is underway through regional strategies such as the East Midlands LEVI programme, which promotes deployment of rapid and ultra-rapid charging hubs along key corridors and in residential areas to ensure equitable access.

The UK Department for Transport (DfT) provides funding and support mechanisms to help local authorities accelerate the rollout of electric vehicle (EV) charging infrastructure. In September 2023, the government allocated £40.3 million to 14 local authorities through the Local Electric Vehicle Infrastructure (LEVI) Fund, aimed at expanding public charging networks and improving accessibility for residents without off-street parking. Research by DfT[35] highlights that the need to change existing parking and refuelling habits is a major barrier to EV adoption. Among surveyed options, near-home on-street charging was rated most desirable, followed by rapid charging stations and workplace charging.

Building on these national and regional commitments, Nottinghamshire has established the Electric Vehicle ChargePoint Framework (NEVCF).[49] This framework aims to provide adequate charging provision to enable the public to make informed choices about vehicle type and to facilitate the replacement of petrol and diesel cars with EVs. It does so by supporting ChargePoint deployment across urban centres, rural areas, highways and public spaces.

Further policy relating to EV charging infrastructure targets and committed have also been developed in the Broxtowe Electric Vehicle Charging Infrastructure (BEVCI)[50] Strategy which aims to provide reliable, accessible, and inclusive EV infrastructure. The strategy aims to achieve the following objectives:

- Establish an annual installation target of 81–100 charge points (public and private stakeholders), based on growth projection scenarios.
- By 2035, ensure all Council owned car parking areas are equipped with appropriate EV charging facilities.
- By 2035, achieve 70% coverage: homes without driveways to be within a five-minute walk of a public charge point.
- Support the Council's fleet transition to achieve near-zero carbon emissions by 2027.

9.3 Do Nothing

The do-nothing scenario represents the best estimate of outcomes before the LAEP is implemented. In terms of modal shift (people switching to more sustainable modes of travel), this scenario assumes uptake is influenced solely by current mandated policies. As of 2025, these policies in the UK include the ban on the sale of new internal combustion engine (ICE) vehicles from 2030, as well as the Zero Emission Vehicle (ZEV) mandate, which requires vehicle manufacturers to sell an increasing proportion of zero-emission vehicles each year.[51]

[47] Electric vehicle public charging devices - ONS

[48] On Street Charging, ZapMap

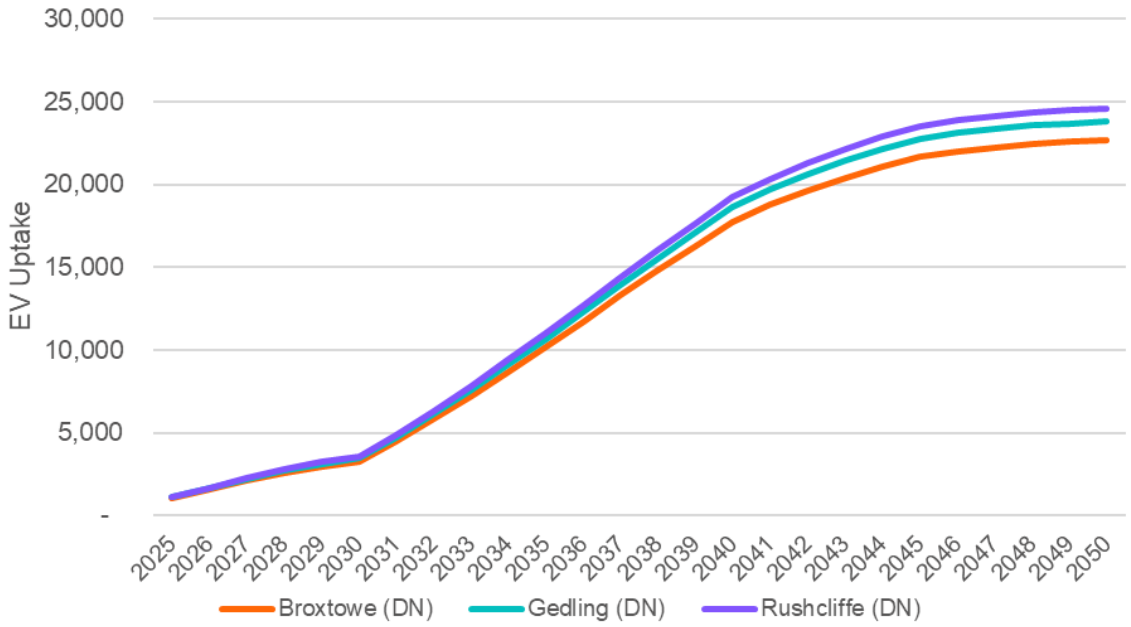
[49] Electric vehicle charging frameworks and strategies | Nottinghamshire County Council

[50] Broxtowe Borough Council. Electric Vehicle Charging Infrastructure 2024-2027. (Broxtowe Borough Council, 2024)

[51] Phasing out sales of new petrol and diesel cars from 2030 and supporting the ZEV transition - GOV.UK

Whilst these existing policies would lead to the continued growth in trends of EV ownership, the insufficient charging infrastructure and lacking policy support would limit the rate of decarbonisation progress and petrol and diesel vehicles would continue to dominate GBR's roads. To evaluate this scale of intervention required, Midlands Connect conducted modelling to examine both the business-as-usual scenario (BAU) and an accelerated electric vehicle uptake scenario through to 2050, as illustrated below.[52]

Figure 9.1: Midlands Connect Modelled Business as Usual EV Uptake Scenario



Source: STB EV Charging Infrastructure Visualiser

'Do nothing' estimates that 22,657 electric vehicles would be adopted by 2050 in Broxtowe, 23,793 in Gedling and 24,571 in Rushcliffe, which represents 40% of GBR's currently licensed vehicles. This demonstrates that under existing policy conditions, Gedling, Broxtowe and Rushcliffe are likely to fall short of transitioning its entire vehicle fleet to zero-emissions models. As a result, the reduction in transport emissions under the do-nothing scenario will be insufficient to meet the UK net zero ambitions within the required timeframe.

The Midlands Connect BAU scenario reflects projections based on current government policies that are confirmed and funded, as well as exogenous factors influencing adoption rates. This scenario anticipates that growth in the electric vehicle market will largely be shaped by factors such as national legislation and the natural turnover of the vehicle fleet. As this BAU scenario aligns with the criteria of the Do-nothing scenario within this LAEP, it has been adopted as the modelled Do-nothing scenario.

For the purpose of this LAEP, net zero is a requirement under different timescales, and this will mean an EV uptake in line with net zero targets. Therefore, to represent this, separate modelling was undertaken to forecast EV uptake in Gedling, Broxtowe and Rushcliffe by 2040 and 2050, in line with the Climate Change Committee's Seventh Carbon Budget which is detailed in Section 9.4.

9.4 Modelling Methodology

This modelling approach used 2021 ONS population data for each district's MSOAs to allocate a share of the UK-wide projection of 37.4 million electric vehicles by 2050. By apportioning this national

[52] STB EV Charging Infrastructure Visualiser

projection according to the local population, the analysis provides district-specific estimates of EV uptake.

The uptake trends were modelled using the Climate Change Committees (CCC) seventh carbon budget[53]. The CCC pathway is slightly more ambitious than the EV mandate through to 2035, due to anticipated reductions in EV costs making this achievable. This pathway results in 97.5% of cars being battery electric by 2050. 2.5% of cars would be covered by other zero emission vehicle types including hydrogen fuel cell and biofuels. The final 1% of current transport emissions (made up of classic cars and 15-year-old ICE cars still in operation in 2050) would be covered by engineered removal methods like carbon capture.

In order to estimate the number of public EV chargers needed, a ratio of public chargers to number of EVs was taken from Midlands Connect 'Supercharging the Midlands' report[54] which cites 1-in-20 would be required. Since chargers are seen as a necessary precursor to mass EV adoption, the uptake curve of public chargers matches the uptake in EVs. Keeping the pace of charging infrastructure roll-out in line with growth in EVs is fundamental to growing public confidence in the viability of EV ownership and therefore achieving the emissions reductions required in private transport.

Similarly, private charger projections were derived using the EV uptake and an EV to private charger ratio based on Zapmap data and an assumption that development in cross pavement charging will enable the percentage of private charger installations to remain the same at 79%, even as uptake spreads further beyond households with off-street parking[55]. Further details of the assumptions used within the modelling are provided in Appendix C.

For the 2040 scenario (2040), the same uptake curve has been used accelerating from 2032, reaching the same final total volume as the 2050 scenario, ten years earlier. The total abated emissions differ from the 2050 scenario due to the changing grid emission intensity factor, across the transition timeline.

For the Do Nothing scenario (DN) the uptake curve has utilised the Midlands Connect BAU data. The annual percentage vehicle uptake in BAU compared to their accelerated uptake, is applied to our 2050 scenario uptake. For example, for the year 2050 the BAU scenario only has 40% of the volume of EVs in the accelerated uptake scenario, thus a factor of 40% is applied to the 2050 volume of EVs in our 2050 scenario to obtain the Do Nothing 2050 uptake value. Relevant datasets used in the EV modelling are listed in Appendix C.

9.5 Results

EV uptake required from present day are 56,958, 59,812 and 61,769 EVs in Gedling, Broxtowe and Rushcliffe, respectively, to achieve the 2050 and 2040 Net Zero scenarios.

These uptakes represent a significant proportion of the region's current fleet of vehicles, with the 2040 scenario requiring over 81% of the current fleet of vehicles to be replaced by 2035, and 59% in the 2050 scenario. To provide a sense of scale, a calculation based on the Society of Motor Manufacturers and Traders (SMMT)[56] and UK government[57] data shows that there are nearly 2 million cars registered a year and approximately 34 million cars licensed, resulting in an expected renewal rate to 2035 of 57% of the total car fleet. As this uptake will take place before the ban of the sale of new ICE vehicles, it will require significant additional coordinated policy interventions, incentives, and investment in supporting infrastructure to reduce the amount of fossil-fuel lock-in during this period.

[53] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf

[54] https://www.midlandsconnect.uk/media/i1spcsr1/mc-supercharging-the-midlands-document.pdf

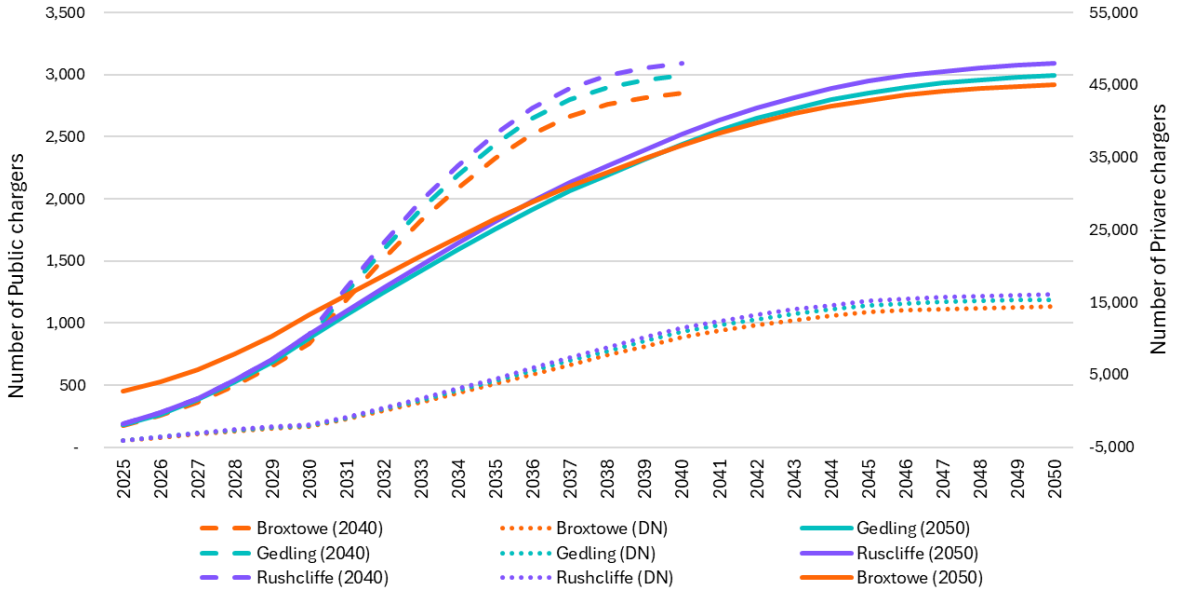
[55] Home and community EV charging stats

[56] 2024 (Full Year) Britain: New Car Market Overview and Analysis - Car Sales Statistics

[57] Vehicle licensing statistics, United Kingdom: 2024 - GOV.UK

Figure 9.2 shows the number of public and private EV chargers required in Gedling, Broxtowe and Rushcliffe under the modelled scenarios to support EV uptake.

Figure 9.2: Required number of public and private chargers



As described in Section 9.4, this figure was derived from the 2025 ratio of EVs to private chargers, with the assumption that this proportion remains constant through to 2050. This reflects the expectation that many EV owners will prefer to have access to their own charger to ensure reliable charging.[58]

Alongside private chargers, public chargers play an important role in ensuring that charging points are accessible to all road users and giving drivers confidence in undertaking longer and inter-urban journeys. The LAEP pathway highlights that the rollout of public charging infrastructure must keep pace with the uptake of electric vehicles.

A total of 141,046 private and 8,927 public chargers were modelled for Gedling, Broxtowe and Rushcliffe to support the EV uptake for the 2040 and 2050 scenarios. This indicates a vast and comprehensive charging infrastructure would be required, with a broad distribution of chargers throughout the region to meet necessary charging needs. Charging points should be placed evenly across the region so that they are accessible within a short distance, with placement decisions based on anticipated demand.

9.6 Impacts

9.6.1 Grid Impact of EV Infrastructure

Gedling, Broxtowe and Rushcliffe will require more electricity to power these new EVs. It is key to determine which areas should take prioritisation when selecting the areas for continued EV charge point growth. Locations such as Kimberley South, Trowell and Awsworth, and Beeston Town in Broxtowe; Woodthorpe and Arno Vale and Carlton in Gedling; and Bingham and Compton Acres and Luttrell in Rushcliffe, which have higher population densities and large coverage of flats and terraced housing, correlating with low percentages of off-street parking, should take priority.

It is crucial that collaboration takes place with the local DNO to ensure the grid is equipped to incorporate the extra demand an increase in EV use will bring, as well as the opportunities in Vehicle-

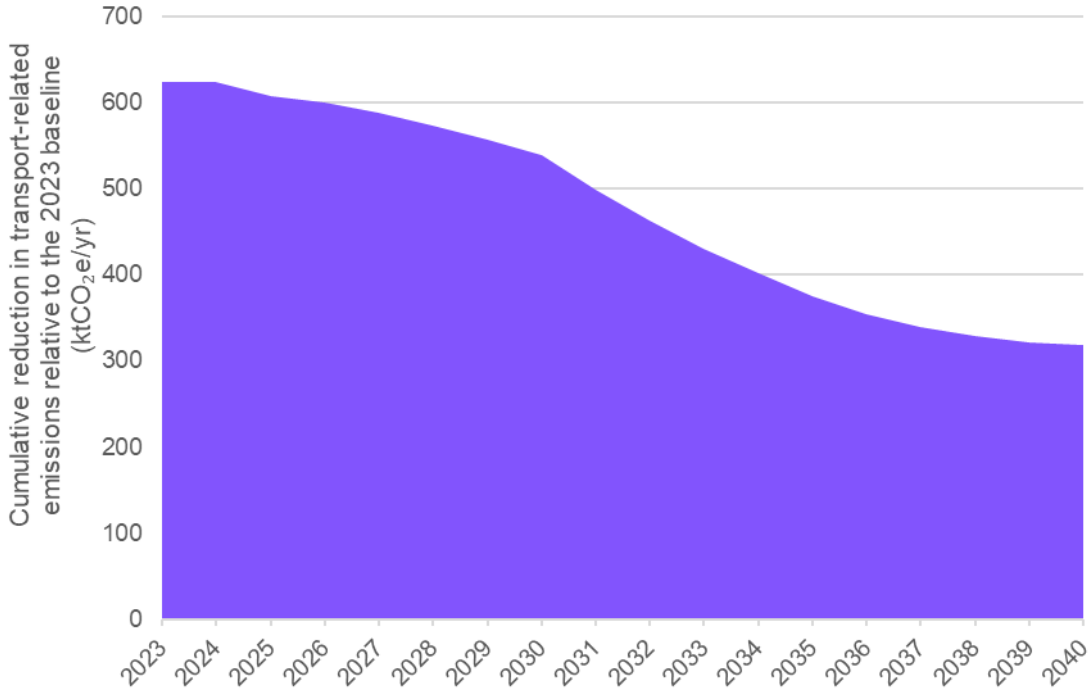
[58] Electric vehicle (EV) driver behaviours and attitudes tracker - GOV.UK

to-Grid storage flexibility. Low space availability as a result of the urban densities across GBR must be a key consideration when planning public EV charge point locations and rapid and ultra-rapid charging hubs. Refer to Section 11 to find more information regarding impacts to the grid infrastructure.

9.6.2 Carbon Impact of EV Infrastructure

Figure 9.3 illustrates the net abated carbon emissions resulting from the transition away from ICE vehicles across both scenarios. It presents the total carbon savings achieved through this transition factoring in both reduced ICE emissions and a change in emissions from electricity usage.

Figure 9.3: Total Abated Emissions from the transition away from Internal Combustion Engines (tCO_2e/year)



The analysis indicates that widespread uptake of electric vehicles could reduce transport related emissions by approximately 49%. Given that transport currently accounts for around 35% of the total territorial emissions, this reduction in private vehicle emissions alone is equivalent to approximately 17% of GBR's current total emissions. Since the analysis does not account for decarbonisation of public, commercial, or freight vehicles, the overall emissions reduction from the transport sector would be expected to increase further as these vehicle types transition to low-carbon alternatives.

The data shows an overall reduction in emissions from GBR's vehicle fleet, influenced by two main factors: increased use of EVs and the ongoing decarbonisation of the electricity grid. In the 2040 and 2050 scenarios the final average emissions per vehicle are expected to be 15.5 and 2.5kgCO_2/year, respectively, down from 1,555 kgCO_2/year in 2025. Although this constitutes a significant reduction in emissions, projected residual emissions from the transport sector are expected to persist, primarily due to the carbon intensity of the electricity grid.

10 Local Generation

This section outlines the opportunity to deploy local generation to support the net zero scenarios for Gedling, Broxtowe and Rushcliffe. Overall, the generation considered in the LAEP is likely to have local impacts where the output is consumed locally, such as with behind-the-meter solar PV and community energy schemes. Utility-scale generation, which contributes to overall electricity grid decarbonisation is not considered within this LAEP.

Number of properties with existing solar PV	
Broxtowe	3,006
Gedling	3,699
Rushcliffe	5,047

Contracted Generation Capacity (MW)	
Broxtowe	0
Gedling	90
Rushcliffe	50

Rooftop PV Potential (GWh)	
Broxtowe	129
Gedling	128
Rushcliffe	125

Energy Storage to Support PV (GWh)	
Broxtowe	71
Gedling	70
Rushcliffe	69

10.1 Existing System

Gedling, Broxtowe and Rushcliffe's electricity demand is primarily met by the national electricity grid, while heat demand is mostly supplied by the national gas grid. The East Midlands area is operated by five DNOs of which National Grid is the electricity provider for GBR. Most of the energy consumed is sourced from outside the region with 1.4GW of operational renewable generation capacity in the East Midlands. The majority of this capacity is located across Nottinghamshire and Lincolnshire where solar and onshore wind account for 1GW and 200MW respectively.[59]

While granular asset-level data for Gedling, Broxtowe and Rushcliffe is not publicly available, regional datasets provide useful proxies. The Embedded Capacity Register does indicate that 49.9 MW of solar generation is agreed to connect in Rushcliffe, and 90 MW of battery storage is agreed to connect in Gedling.

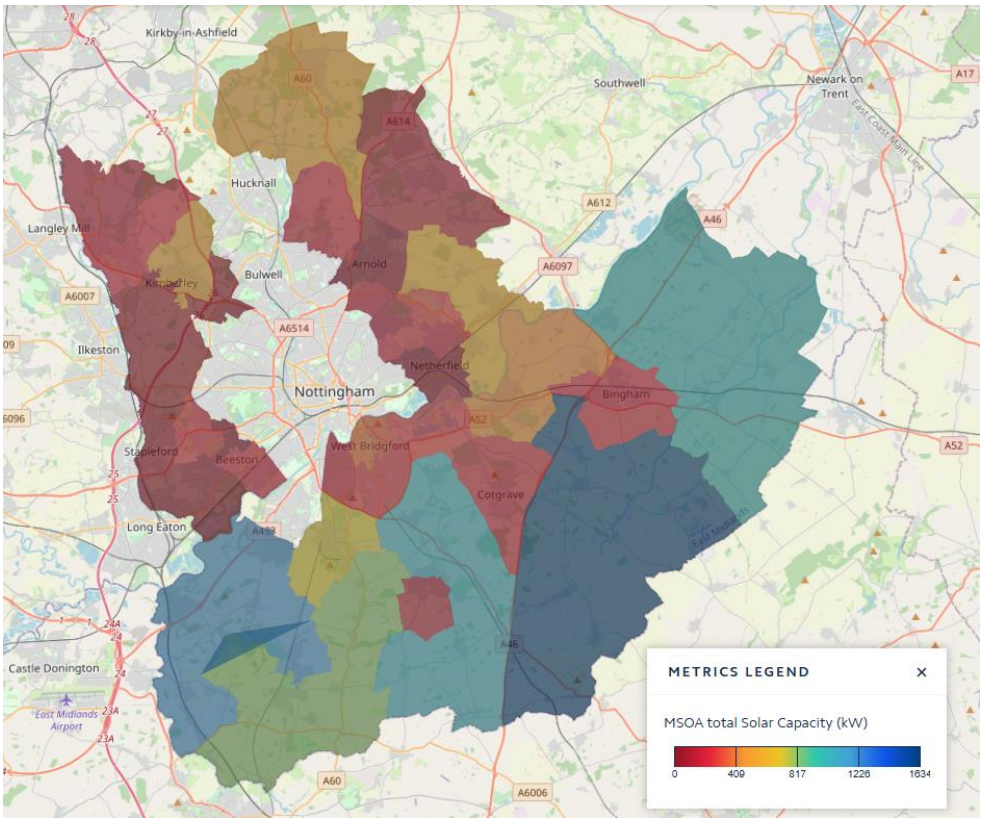
While there is currently no policy mandating installation of rooftop solar on homes, recent trends show that growth has been expanding in the region, with 685 properties in Gedling, 511 in Broxtowe Dales and 905 in Rushcliffe, fitted with rooftop solar PV panels from April 2025 to April 2026.[60]

Figure 10.1 displays the existing total solar capacity across Gedling, Broxtowe and Rushcliffe by MSOA. Most of Rushcliffe, in particular Cropwell Bishop, Kinoulton and Upper Broughton, stood out as having the highest total installed solar capacity. This is due to the fact that Rushcliffe has the largest proportion of rural areas with more single-family housing. Single family housing usually has more available roof space and less obstructions from neighbouring buildings, leading to more feasible installations on South, South-East and South-West facing roofs.

[59] NESO. The Nations and Regions Contexts are the first of four key components of transitional Regional Energy Strategic Planning (tRESP) . (NESO, 2025)

[60] https://datadashboard.mcscertified.com/InstallationInsights

Figure 10.1: Total solar capacity in Gedling, Broxtowe and Rushcliffe (kW)



10.2 Do Nothing

As stated in Section 1, opportunities from large-scale distributed generation connected at the Grid Supply Point (GSP) level have been excluded from this LAEP analysis, as these assets contribute to national energy supply and their associated emissions are already captured within the carbon intensity factors used for electricity consumption.

Gedling, Broxtowe and Rushcliffe's LAEP therefore focuses on distribution-connected and locally influenced generation, such as rooftop solar and community-scale renewables.

While there is nothing legislated that mandates local generation, the government's Clean Power Action Plan does set out ambition for high level regions.

10.3 Context

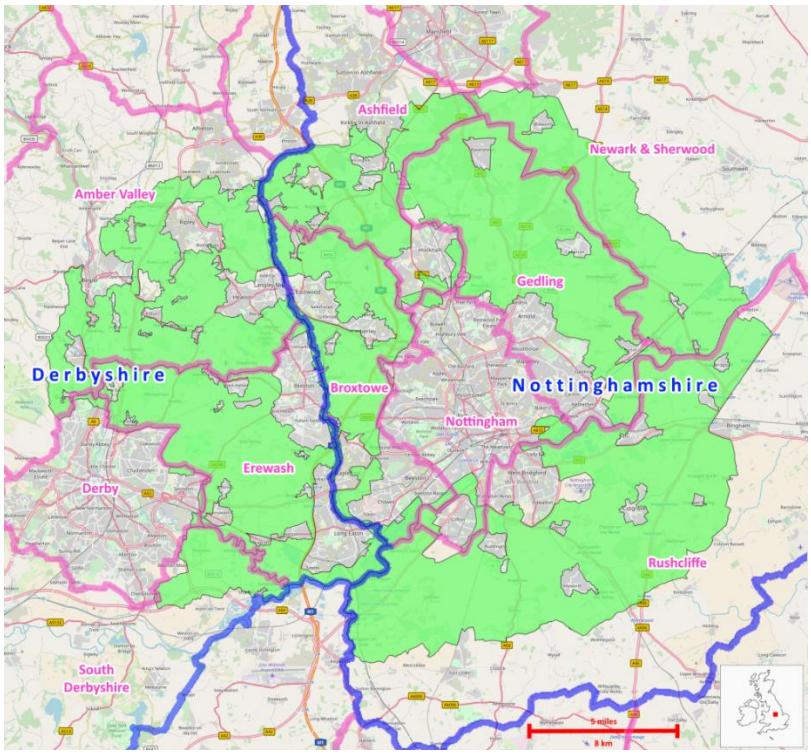
The Great Nottinghamshire Strategic Plan (GNSP) covering Broxtowe, Nottingham City and Rushcliffe, outlines its framework to support the transition to low carbon energy by introducing policies that promote low carbon renewable energy generation including solar, wind and other technologies. Though the plan does not yet detail specific projections for the improvements in renewable energy capacity, strategic allocations have been identified at the former Ratcliffe-on-Soar power station in Rushcliffe as well as in Field Farm, Toton and Bennerley Coal Disposal in Broxtowe.[61]

[61] Broxtowe Borough Council, Nottingham City Council, Rushcliffe Borough Council. Greater Nottingham Strategic Plan (2025)

Gedling pulled out of the GNSP in 2025, producing their own local energy plan. There are no specific targets set in here for renewable generation capacity, however the policy acts as a checklist of criteria that generation proposals must meet whilst considering the restrictions of the green belt. The policy also identifies the need for a Supplementary Planning Document to advise on renewable energy proposals on the limitations of specific potential landscapes.[62]

Proposed renewable generation capacity is defined by the Greater Nottinghamshire green belt whereby development for large-infrastructure projects, including renewable energy projects, is typically restricted if deemed an 'inappropriate development', unless significant environmental benefits can be proven. Rushcliffe has the largest non-green belt defined area as displayed in Figure 10.2 which explains why it has the biggest proposed renewable generation capacity of 300MW. Gedling and Broxtowe are more dominated by green-belt areas with 1.2MW and 0.6MW of proposed capacity respectively.

Figure 10.2: Nottinghamshire green belt in relation to borough council area boundaries



Source: Open Government Licence

Nottinghamshire is also home to one of the UK's most ambitious renewable energy projects, the Spherical Tokamak for Energy Production (STEP) which is a flagship energy fusion project aiming to demonstrate net energy fusion by the 2040s. The project is located at the former coal-fired power station in West Burton, at the heart of Nottinghamshire's Megawatt valley. Though the project has not been included in capacity forecasting in this LAEP, a successful outcome of this project would significantly impact both the area's contribution to the grid and the energy security of the region.[63]

[62] Gedling Borough. Local Planning Document Part 2 Local Plan. (Gedling Borough, 2018)

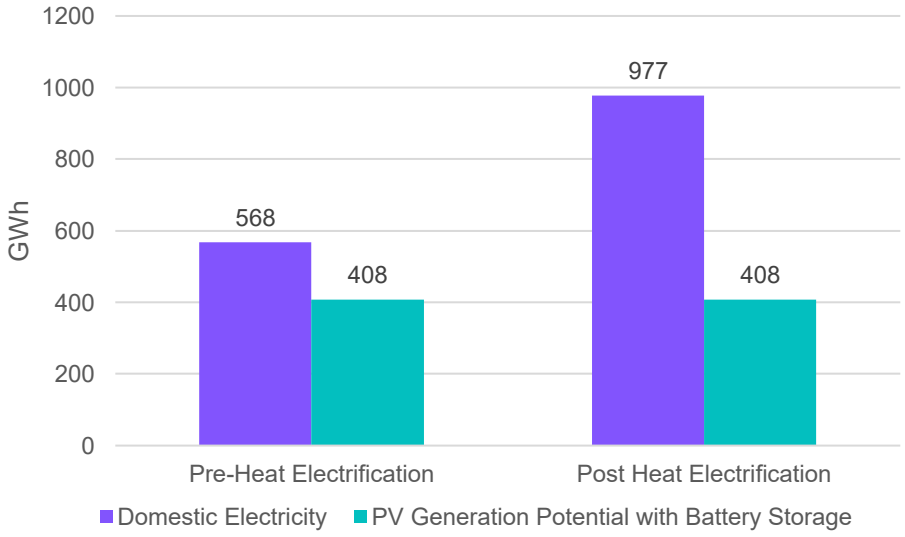
[63] Step Fusion. A Home For The Future. (Step Fusion, 2025)

10.4 Intervention Methodology

A suitability assessment was undertaken using the calculated areas of rooftop space available and the orientation of each building.

IES have modelled optimal uptake of solar PV panels to be installed on 80% of feasible South, South-East and South-West facing roofs, illustrated in Figure 10.3, which would enable up to 408 GWh of generation across domestic properties. This assumption is due to the prevalence of hipped and gabled roofs, chimneys, and skylights. It was determined that funding would come via Research and Development (R&D) funded projects.

Figure 10.3: Gedling, Broxtowe and Rushcliffe Domestic Electrical Demand and Potential PV Generation



The average efficiency of panels was modelled at 18%. Domestic and non-domestic buildings were divided into single dwellings/units and multi-dwellings/units, and the total energy generation was determined for each orientation (S, SE, SW).

Although specific battery capacities (in terms of energy and power) are not calculated, it is assumed based on UK research that 45% of the photovoltaic energy yield is used by the building, while the remaining 55% is stored for later use. This storage capacity could be provided by a mix of technologies, such as home batteries or vehicle-to-grid connections. The share of storage to PV is representative at the local authority level, rather than at the individual property level, to allow for the flexibility in consumer choice and energy usage patterns.

Ground Mount solar opportunities have been excluded from modelling due to the lack of suitable identified council-owned land in Gedling, Broxtowe and Rushcliffe.

10.5 Scenarios

Figure 10.4 and Figure 10.5 illustrate domestic and non-domestic rooftop solar uptake, and to support alignment with the net zero by 2040 and 2050 targets. Modelling of the uptake peaks in 2034 which aligns with the UK's anticipated grid decarbonisation.

Figure 10.4: 2050 and 2040 scenario domestic rooftop solar uptake projections

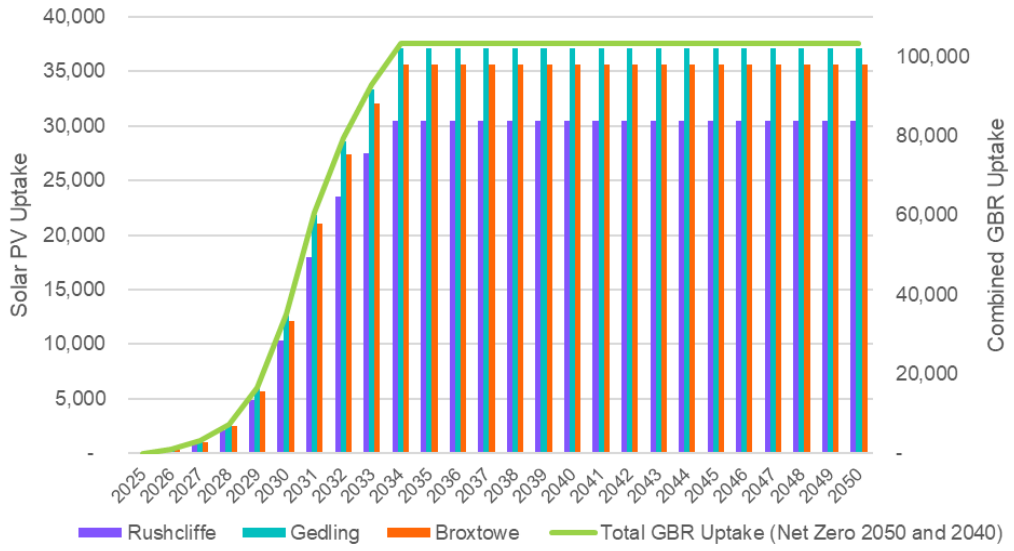
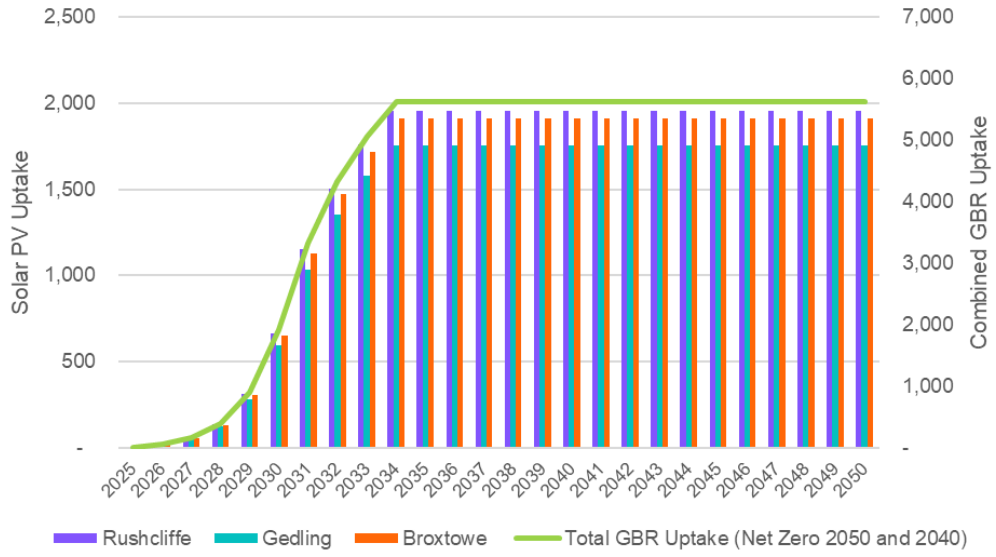


Figure 10.5: 2050 and 2040 scenario non-domestic rooftop solar uptake projection



These uptake curves have been modelled based on the understanding that following the decarbonisation of the electricity grid no further carbon benefit of rooftop PV would be realised. Nonetheless, local expansion of grid capacity and generation capability will continue to bring other benefits such as reduced consumer bills, reducing grid connection and capacity constraints which increased electrification brings such as from space heating and EV charging, and demand side response resilience with storage capacity.

Year	Annual Increase in Yield (MWh)			
	Annual Percentage Uptake	Gedling	Broxtowe	Rushcliffe
2025	1.0%	940	860	900
2026	0.7%	686	628	657
2027	1.1%	1,053	963	1,008
2028	2.0%	1,852	1,694	1,773
2029	3.4%	3,224	2,950	3,087
2030	5.8%	5,424	4,962	5,193
2031	9.1%	8,507	7,783	8,145
2032	12.7%	11,938	10,922	11,430
2033	15.3%	14,363	13,141	13,752
2034	15.3%	14,363	13,141	13,752
2035	12.7%	11,938	10,922	11,430
2036	9.1%	8,507	7,783	8,145
2037	5.8%	5,424	4,962	5,193
2038	3.4%	3,224	2,950	3,087
2039	2.0%	1,852	1,694	1,773
2040	1.1%	1,053	963	1,008
2041	0.0%	0.0	0.0	0.0
2042	0.0%	0.0	0.0	0.0
2043	0.0%	0.0	0.0	0.0
2044	0.0%	0.0	0.0	0.0
2045	0.0%	0.0	0.0	0.0
2046	0.0%	0.0	0.0	0.0
2047	0.0%	0.0	0.0	0.0
2048	0.0%	0.0	0.0	0.0
2049	0.0%	0.0	0.0	0.0
2050	0.0%	0.0	0.0	0.0

Figure 10.6: Rooftop PV annual uptake of installations in preferred scenario

If the price of solar PV panels and battery storage continues to drop at the current rate, then solar PV will likely become cost-effective for most households within the next 5-7 years, supporting necessary uptake as detailed in Figure 10.6.

There is currently no funding available from the UK Government for domestic solar panels, so homes at risk of fuel poverty may not be able to afford the up-front costs. This is where local government and social housing providers will need to step in to signpost funding pathways to PV installation across all socioeconomic groups.

There is scope to encourage more widespread adoption of solar PV in the short term through community-owned renewable schemes, where a group of homeowners and landlords can communally purchase solar PV panels for their street or neighbourhood together. This helps to reduce costs through economies of scale and has the potential to save residents upfront costs and energy bills.

Figure 10.7 and Figure 10.8 show annual yield projections for domestic and non-domestic PV.

Figure 10.7: 2050 and 2040 scenario domestic rooftop solar annual yield projections

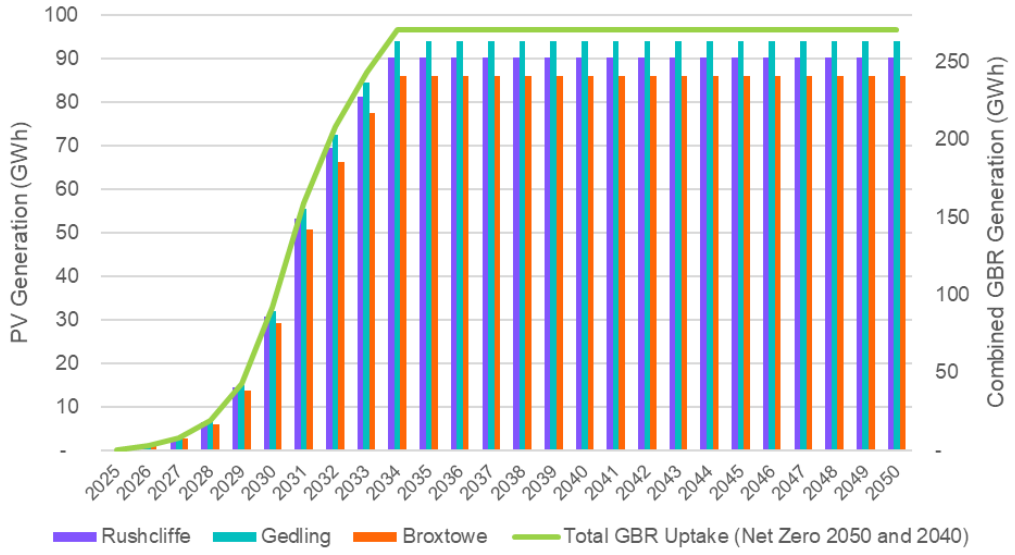
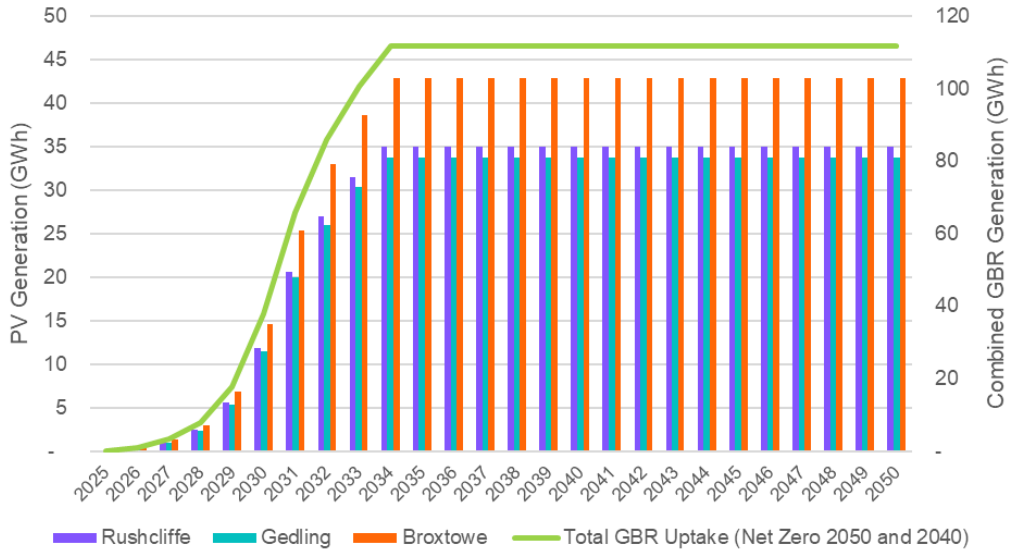


Figure 10.8: 2050 and 2040 scenario non-domestic rooftop solar annual yield projections



Across GBR, annual rooftop PV yield for both domestic and non-domestic properties is modelled to expand in 38.2 GWh increments to peak at 382 GWh in 2034. Non-domestic annual yield is similar to domestic properties despite significantly less installations. This is due to the larger roof spaces available on these properties, allowing for larger sized systems.

Since the carbon intensity of the electricity grid is expected to decline significantly by 2035, the greatest carbon benefit from rooftop PV occurs when installations happen before full grid decarbonisation. Beyond this point, the marginal carbon savings from additional rooftop PV diminish. Nonetheless, local expansion of grid capacity and generation capability will continue to bring benefits such as reducing grid connection and capacity constraints, particularly as electrification increases through technologies like space heating and EV charging. It also enhances demand-side response resilience, especially when paired with local storage capacity.

Recent market analyses suggest that the cost of solar PV panels and battery storage systems is continuing to decline, driven by technological advancements, economies of scale, and supportive policy frameworks. For example, capital expenditure for battery energy storage in Great Britain has fallen by 30% since 2022, and further reductions are expected over the next five years. Global forecasts also indicate that battery storage costs could drop by up to 40% by 2030[64], making solar-plus-storage systems increasingly competitive with conventional energy sources.

In the context of this modelling, these cost trends support the assumption that solar PV and battery systems may become cost-effective for a majority of households within the next 5–7 years. This assumption influences the uptake trajectory in the net zero scenarios, where widespread adoption is required to meet carbon reduction targets.

The affordability of these technologies is a key enabler for achieving Gedling, Broxtowe and Rushcliffe's net zero targets, particularly in residential sectors where decentralised energy generation and storage can reduce grid dependency and enhance local energy resilience.

There is currently no direct funding available from the UK Government for domestic solar PV installations, which presents a significant barrier to uptake, not only for fuel-poor households,

[64] Outlook for battery demand and supply – Batteries and Secure Energy Transitions – Analysis - IEA

but also for middle-income families who may struggle with the upfront costs. This financial barrier risks slowing down the widespread adoption of PV across GBR.

11 Networks, Storage and Flexibility

This chapter explores the current state of the National Grid electrical network, planned infrastructure upgrades, and impact of Low Carbon Technologies on the local network planning in Gedling, Broxtowe and Rushcliffe. Nottinghamshire is expected to experience continued growth in population and housing, alongside the wider transition to electric vehicles and low-carbon heating systems. These factors will collectively drive a significant increase in local electricity demand, highlighting the need for the network's capacity and resilience to evolve to meet future requirements. At present, regional-level strategies do not yet include quantitative projections of future energy demand or network impacts. As such, forward-looking energy planning and modelling at the local level are essential to understand how heat pump uptake, electric vehicle adoption, and new housing growth will interact to shape Gedling, Broxtowe and Rushcliffe's future electrical and wider energy needs.

11.1 Existing Network Constraints

Gedling, Broxtowe and Rushcliffe's electricity distribution is operated by National Grid Electricity Distribution (NGED) as part of its East Midlands licence area. NGED is the Distribution Network Operator (DNO) responsible for maintaining and operating the local electricity network.

The local distribution grid connects to the National Grid Transmission System via Grid Supply Points (GSPs), which step down voltage from 400 kV/275 kV to 132 kV. From these GSPs, Bulk Supply Points (BSPs) (typically 132/33 kV) feed primary substations (usually 33 kV/11 kV), which then distribute electricity to homes, businesses, and industrial users across GBR and surrounding areas.

Of the East Midlands licence area's 14 GSPs, the following are the most relevant within or adjacent to the GBR area:

- Ratcliffe GSP: Located adjacent to the Ratcliffe-on-Soar Power Station site at the southern edge of Rushcliffe. This is one of the East Midlands' largest transmission nodes and will play a central role in future regional reinforcement, particularly as the Ratcliffe site transitions to a clean energy and innovation hub, under the East Midlands Freeport development.
- Stoke Bardolph GSP: Situated on the eastern boundary of Gedling Borough, serving parts of Gedling and eastern Nottingham. It is a key connection point for local substations and supports both residential and light-industrial demand in Gedling and neighbouring areas.
- Enderby GSP: Located further south-west but part of the wider network serving Broxtowe and southern Nottinghamshire, providing important interconnections and resilience.

Other East Midlands GSPs include Willington, Drakelow, and Chesterfield.These supply points are critical for ensuring network stability, regional resilience and headroom as electricity demand grows through heat electrification, EV charging, and increased local generation. Early and continued engagement with NGED is essential to understand available capacity, potential constraints on 11 kV and 33 kV feeders, and opportunities for strategic reinforcement or flexibility solutions to support low-carbon infrastructure deployment across the GBR area.

Figure 11.1: Average Utilisation Factor (%)

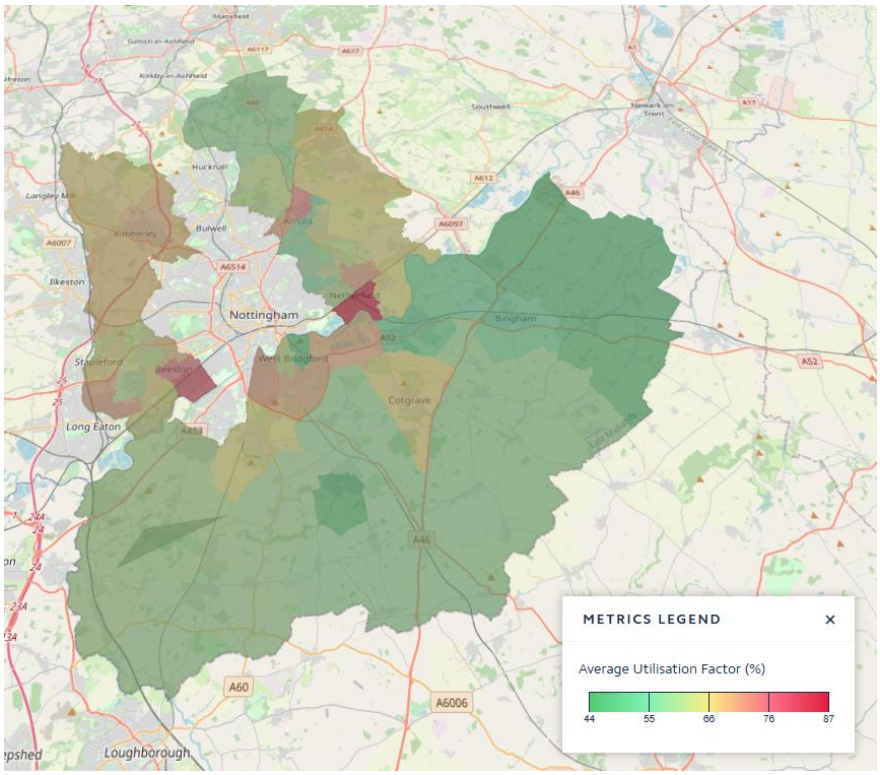


Figure 11.1 illustrates the average grid utilisation factor (%) across the electricity distribution network in GBR. The utilisation factor represents the ratio of maximum demand to the rated capacity of each local substation, providing an indication of how intensively the existing grid infrastructure is being used. Areas with higher utilisation (above 70%) are operating closer to capacity and are more likely to require reinforcement in the short-to-medium term as electrification increases, while areas with lower utilisation (below 55%) retain greater flexibility to accommodate new electrical loads.

Across the GBR area, utilisation levels range approximately from 44% to 87%, displaying clear spatial variation linked to settlement density and proximity to transmission assets.

- Higher utilisation zones are evident in southern Gedling and most prominently around Beeston Town and Beeston Rylands in parts of south-east Broxtowe near Kimberley and Eastwood, where utilisation factors typically fall between 70–85%. These areas correspond to dense residential and mixed-use zones where existing power demand is already high, and substation capacity is more constrained.
- Moderate utilisation (around 55–70%) occurs across much of Broxtowe, eastern Gedling in Calverton and Woodborough and northern Rushcliffe in Cotgrave and Ruddington, reflecting balanced suburban energy demand and established local distribution networks.
- Lower utilisation areas, typically below 55%, are concentrated across more rural areas southern and western Rushcliffe, extending towards Ruddington, East Leake, and the Ratcliffe-on-Soar Power Station corridor. These zones benefit from their proximity to the Ratcliffe GSP and lower population density, providing significant scope to accommodate electrified heat, transport, and distributed renewable generation without immediate reinforcement.

This variation highlights important opportunities for strategic sequencing of low-carbon deployment. Areas of lower utilisation can support early electrification and distributed energy schemes, while higher utilisation zones will require close collaboration with NGED to plan for reinforcement, flexibility services, or demand-side management.

Figure 11.2: Average Headroom (%)

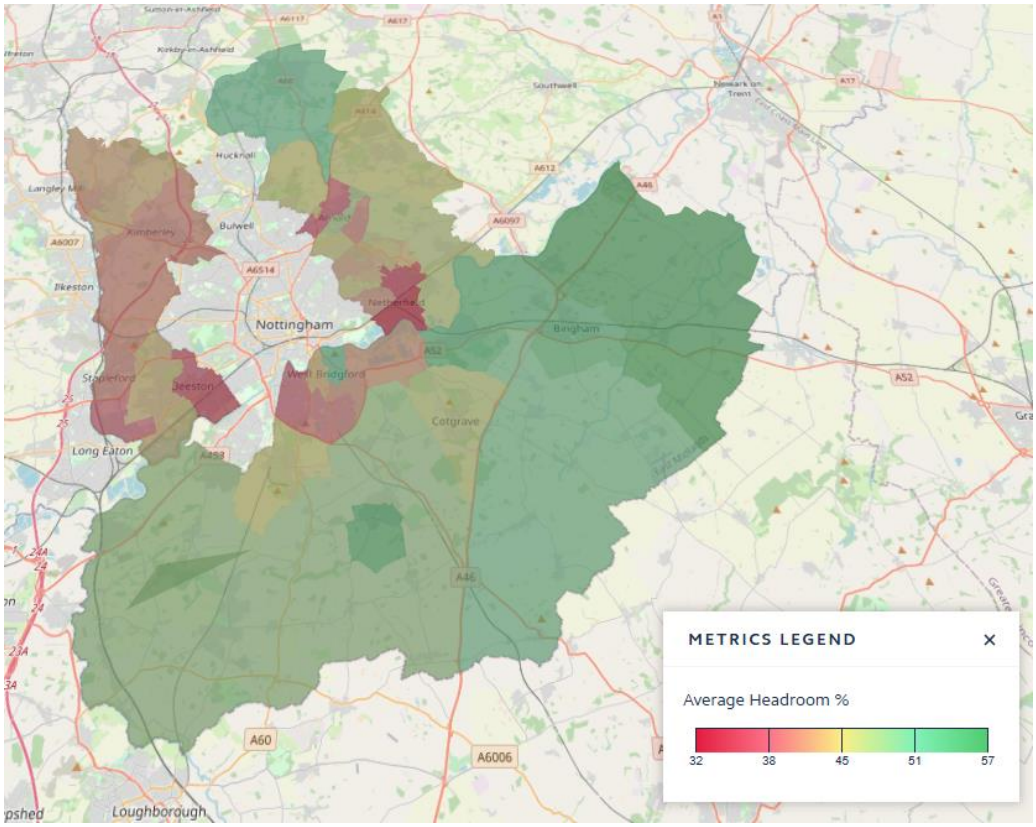


Figure 11.2 illustrates the average available headroom (%) across the electricity distribution network in GBR. Headroom represents the proportion of existing grid capacity that remains unused under normal operating conditions. This is a key indicator of the network's ability to accommodate future increases in demand from electrified heat, EVs, and new developments.

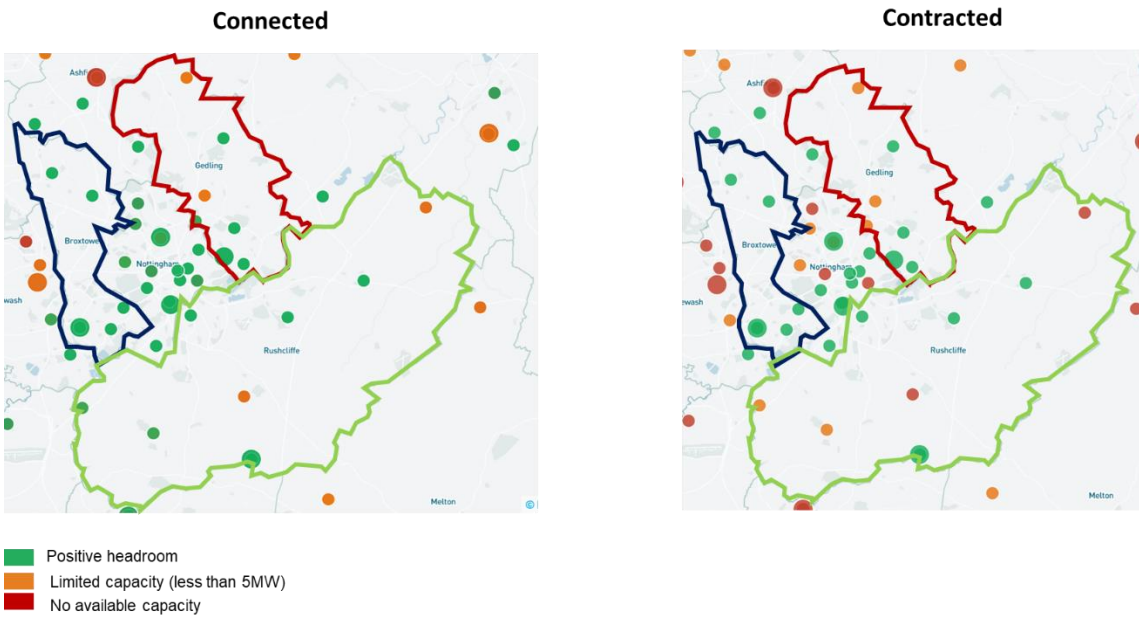
Across the GBR area, headroom levels vary notably by geography. The central and northern-eastern parts of Rushcliffe show the highest available capacity, with several zones displaying over 55% average headroom. This reflects their proximity to the Ratcliffe GSP and lower existing load densities. These areas are therefore well positioned to support early electrification and distributed generation without immediate reinforcement.

In contrast, northern Broxtowe (including areas around Kimberley and the fringes of Nottingham) and parts of central and eastern Gedling exhibit lower headroom levels (typically 30–40%), indicating a tighter network with limited spare capacity. These areas are more urbanised, containing denser residential development and higher commercial loads, which increase utilisation at local substations.

This spatial variation has important implications. Areas of high headroom should be prioritised for early deployment of low-carbon technologies such as heat pumps, EV charging infrastructure, and solar generation. Meanwhile, lower headroom zones will require targeted

engagement with NGED to plan network reinforcement, flexibility solutions, or smart demand management ahead of widespread electrification.

Figure 11.3: Network Map: Primary Demand Headroom



Source: National Grid Network Opportunity Map

Figure 11.3 presents the Primary Demand Headroom across GBR, showing the estimated capacity available at each primary substation to accommodate new electrical demand without requiring immediate reinforcement.

Two scenarios are illustrated:

- Connected network position represents the capacity of the currently installed network infrastructure and mains.
- Contracted network position represents the connected network position plus all contracted future connections, reflecting the capacity impact of developments that have already been approved but not yet energised.

Each substation is colour-coded using a standard RAG rating:

- Green: Positive headroom (greater than 5 MW available)
- Amber: Limited headroom (less than 5 MW spare)
- Red: No available headroom (existing or contracted demand exceeds current capacity)

Across Gedling, Broxtowe and Rushcliffe, the connected position map indicates that most primary substations currently operate with positive headroom, particularly across southern and western Rushcliffe and parts of Broxtowe. These areas show relatively low existing load and are well placed to accommodate early low-carbon electrification and new housing growth without immediate reinforcement.

However, when contracted future connections are included, several substations, particularly in northern Gedling, the Nottingham fringe, and eastern Broxtowe, shift from green or amber to red, indicating that capacity is already constrained once future developments are accounted for. This includes areas near Arnold, Hucknall, and along the A52 corridor where planned residential and commercial growth will significantly increase electrical demand.

The transition between the connected and contracted positions highlights emerging network pinch points, where local reinforcement or flexibility solutions (e.g. demand-side response or storage) may be required to release capacity. These insights are essential for helping to:

- Prioritise “grid-ready” zones for early deployment of heat pumps, EV charging, and distributed generation.
- Identify strategic substations requiring reinforcement or flexibility investment.
- Align spatial development planning with network capacity and NGED’s future investment programmes.

Overall, the analysis suggests that while much of Rushcliffe retains healthy headroom, Gedling and Broxtowe face growing substation constraints under the contracted scenario. This emphases the importance of proactive grid planning to support the region’s net zero transition.

11.2 Network Impact

After Diversity Maximum Demand (ADMD) represents the maximum expected electrical demand, adjusted to reflect the fact that not all homes and businesses will use their peak load simultaneously. This diversity of usage (where appliances and systems are not all operating at full capacity at the same time) allows network planners to design infrastructure more efficiently, avoiding unnecessary oversizing while still ensuring reliability.

ADMD plays a crucial role in assessing the total connected capacity required at substations. By applying the ADMD value to the number of dwellings or technologies modelled, planners can estimate the aggregate peak demand that the substation must be capable of handling. This informs decisions about transformer sizing, cable ratings, and switchgear specifications.

We have modelled the After Diversity Maximum Demand (ADMD) for low carbon technology (LCT) adoption across Gedling, Broxtowe and Rushcliffe, focusing on ASHP and electric vehicle (EV) charging demand. This includes heat pumps for both domestic and non-domestic users, as well as public and private EV charging infrastructure. The modelling approach uses scenario-based uptake rates for EVs and heat pumps, applying diversity factors of 0.7 for EV chargers, 0.8 for non-domestic ASHPs, and 0.65 for domestic ASHPs.

Table 11.1: Estimated increase in ADMD across GBR attributed to adoption of LCTs (EV charging and ASHPs)

Scenario	2030	2035	2040	2050	Annual Growth (MW)
2040 Net Zero	748	1,100	1,452		88
2050 Net Zero	559	822	1,086	1,612	60

Figure 11.4: GBR aggregated ADMD increases (MW)

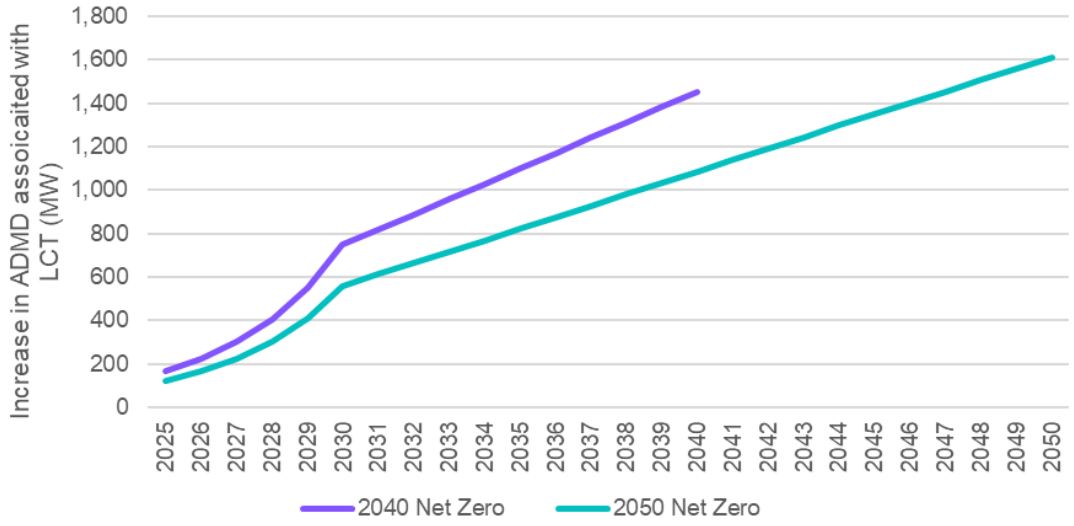


Figure 11.4 illustrates the projected increases in ADMD for the GBR area under the 2040 and 2050 decarbonisation scenarios.

Both scenarios show a significant rise in peak demand over the coming decades, reflecting widespread electrification of heat and transport alongside population and housing growth. Under a 2040 Net Zero pathway, demand growth accelerates sharply from the early 2030s, reaching its peak by the late 2030s. The 2050 pathway shows a more gradual increase, with similar demand levels reached approximately a decade later.

This model provides a robust case for proactive investment in distribution network upgrades. Bringing forward the Net Zero target by ten years roughly doubles the rate of load growth in the 2030s, reinforcing the need for proactive planning with NGED to deliver timely reinforcement and demand management.

11.2.1 Impact of Negative Headroom on Net Zero

As shown in the previous section, any net zero compliant scenario will result in ‘negative headroom’. Negative headroom indicates that the projected ADMD exceeds the available network capacity at the substation level. In other words, the infrastructure is no longer sufficient to accommodate the expected load. This breach signals the need for reinforcement measures such as substation upgrades, or deployment of flexibility solutions to avoid constraints, maintain reliability, and support continued connections to the network.

Network constraints have direct consequences for how quickly and affordably new connections can be made to the electricity network. When substations are operating beyond their capacity, new connection requests, whether for new or existing domestic, new industrial or commercial connections, or LCT installations, may be delayed or queued until reinforcement works are completed. This can slow down the pace of electrification, decarbonisation and urban expansion, particularly in areas with high growth or ambitious Net Zero targets.

Financially, the breach of headroom often triggers the need for costly infrastructure upgrades. These may include installing new transformers, expanding substation capacity, or reinforcing feeder circuits. Under current regulatory frameworks, some of these costs may be passed on to the connecting customers, especially if the reinforcement is deemed customer-specific rather

than strategic. For example, a large industrial site may apply to the DNO for additional electrical capacity, so that an industrial process and heating could be decarbonised. If this would cause a breach at the primary substation, and therefore negative headroom, a portion of the cost to upgrade the network infrastructure could be passed to the individual customer. Furthermore, the customer will need to wait for the DNO to carry out this work before the additional electrical capacity is released, potentially delaying the plan to align with network availability.

In areas with persistent constraints, alternative approaches such as flexibility services, energy storage, or demand-side management may be considered to defer or reduce the need for capital investment. However, these solutions require coordination, digital infrastructure, and regulatory support to be effective. The results shown in this LAEP, should be reviewed in detail by NGED and NESO, so that network improvements can be planned proactively and at a system level. This would reduce the risk that individual customers need to bear disproportionate costs or experience time delays, as electrical network infrastructure can stay ahead of decarbonisation and growth within the area.

11.3 Storage and Demand Side Response

Demand Side Response (DSR) refers to the strategic adjustment of electricity consumption patterns by end users in response to signals from the network operator. These signals may include price incentives, time-of-use tariffs, or direct requests to reduce or shift demand during peak periods. DSR enables the electricity system to operate more flexibly by aligning demand with available supply, particularly during times of network stress or limited capacity.

The implementation of DSR alongside stationary energy storage, particularly when integrated with PV systems, offers a powerful mechanism for managing grid constraints and enhancing local energy resilience. Solar PV enables sites to generate their own electricity, while battery storage captures surplus generation for later use.

This stored energy can then be discharged during peak demand periods, aligning on-site consumption with grid needs and reducing pressure on the network.

This coordinated flexibility helps lower peak demand during periods of increased demand, mitigating breaches of headroom and deferring the need for costly infrastructure upgrades such as transformer replacements or feeder circuit expansions. By generating low-carbon energy that is both affordable and secure, the combined use of DSR and storage contributes to addressing the energy trilemma.

In the context of GBR's Net Zero ambitions, DSR paired with stationary storage presents a financially beneficial solution. It empowers energy consumers to actively support grid stability while potentially accessing reduced energy costs and financial incentives. However, successful deployment depends on robust digital infrastructure, clear regulatory frameworks, and close collaboration between DNOs, aggregators, and end users.[65]

[65] Energy Institute. Introduction to Demand Side Response.

12 Economic Assessment

12.1 Overview of economic assessment

The high-level assessment of costs and benefits for decarbonising the area under the two transition scenarios, 2040 and 2050, indicates that investment in the local energy transition could deliver significant benefits relative to the 'Do nothing' scenario. Although the required investment is substantial and the pace of transition will depend on sustained policy and grant support, it is expected to generate benefits through lower energy bills, carbon reduction, improved air quality, and employment stimulation in the local economy.

This analysis estimates indicative capital expenditure (capex) and cash and non-cash costs and benefits[66] for the interventions within scope. This reflects the strategic, early-stage nature of the LAEP and aligns with other LAEPs developed across the UK. If this capex is spent, then significant benefits can be realised, summarised in Table 12.1 for both scenarios.

- **Total estimated capex to 2050 in both scenarios is £6.5 billion in 2025 values, before the impact of discounting.** This is the gross cost without considering the contribution from government subsidy programmes, therefore the cost of investment to the local economy is likely to be significantly lower given existing grant support and national government commitment enshrined in law to achieve Net Zero by 2050. The success of the transition under current market conditions is dependent on sustained grant support, which will strongly influence the scale and pace of action.
- **Deep fabric retrofit and domestic and non-domestic air source heat pumps account for 78% of the total investment (£4.5 billion**). This investment is expected to be funded through a combination of public sector support and household/organisation contributions.

Benefit estimates from deploying technologies in the two net zero scenarios include:

- **Carbon savings:** £1.7 billion for 2040 and £1.4 billion for 2050 (discounted) in carbon reduction driven primarily driven by the installation of domestic air source heat pumps.
- **Air quality improvements:** £22 million for 2040 and £15 million for 2050 (discounted) of benefits to human health, productivity, wellbeing, and the environment due to improvements in air quality.
- **Impact on bills:** £904 million for 2040 and £931 million for 2050 (discounted) of savings from utility bills which are a result of self-generation (rooftop solar), fuel switching to lower-cost technologies, and reduced energy demand through retrofit measures. Sensitivity analysis suggestions this could vary to generate savings between £728 million and £1,325 million under the 2050 scenario, depending on energy price trends.
- **Substantial economic activity could be generated from the transition.** Assuming installation and fitting of these technologies are carried out by workers, the average economic contribution per year could be £94 million to £97 million, with an aggregate impact of £2.5 billion to 2050.
- **Transition to EVs enabled by charging infrastructure could generate significantly greater benefits,** most notably additional £897 million to £1 billion of carbon reduction benefits. These enabled benefits are always shown separately in the subsequent analysis.

[66] Cash benefits reduce actual expenditure or release cash that can be reallocated elsewhere such as direct financial savings, revenue generation, and avoided costs.

non-cash benefits do not result in direct financial savings but still contribute to public or social value – for example carbon savings.

Table 12.1: Estimated capex and associated benefits, vs do nothing, £' m

£m (2025)	2040 (£' m)	2050 (£' m)
Discounted values		
Capex (discounted)	4,892	4,410
Carbon savings	1,701	1,361
Air quality improvements	22	15
Impact on bills (ex VAT)	904	931
Capex (financial)	6,457	6,457
Average annual economic contribution (GVA)	88	90
Aggregated economic contribution (GVA) to 2050	2,298	2,335

Source: Mott MacDonald

12.2 Approach to analysis and key considerations

For the two transition scenarios (2040 and 2050), costs and benefits from the scenarios are estimated. These cover capital expenditure (both undiscounted and discounted) and welfare enhancing benefits and economic contribution, which are derived from the following core inputs:

- Modelled installation volumes for net-zero technologies
- Modelled changes in gas and electricity consumption
- Unit costs for technology purchase and installation, based on published sources (e.g., DESNZ), as well as internal data from Mott MacDonald cost consultants.
- Published assumptions on carbon appraisal values, air quality damage costs, and the economic value of net zero transition activities.

This assessment quantifies and presents capital expenditure (CAPEX) to 2050 - both discounted and undiscounted - for net zero technologies deployed under two scenarios: delivery by 2040 and delivery 2050, each assessed relative to a 'do minimum' counterfactual.

Undiscounted CAPEX is provided to show the total financial outlay required to 2050, in 2025 prices, without adjustments for risk, inflation or the time value of money.

Discounted CAPEX is presented to show the adjusted CAPEX value reflecting the time value of money, for economic analysis and in line with HM Treasury Green Book best practice. This applies the Green Book social time preference of money.

In addition to capital costs, the analysis considers associated cash and noncash benefits, including carbon savings, air quality improvements. In addition, a high-level estimate of economic contribution from employment associated with capex is presented.



CAPEX (cash)



Valuation of carbon impacts (non-cash)



Impact on bills (cash)



Improvement in air quality (non-cash)



Valuation of economic contribution (non-cash)

When interpreting the analysis, several key considerations should be considered around:

- The scope of analysis
- Price base, discounting and appraisal period
- Cost base assumptions
- Bill impacts
- Benefits associated with EV charger deployment
- Assumptions and sources.

12.2.1 Scope of the analysis

While we have estimated capex and outlined indicative benefits that might result from investment, some costs and benefits fall outside the scope of this exercise (e.g., operational expenditure). Accordingly, this is not a full Cost Benefit Analysis (CBA) and the analysis is not presented as an aggregate Net Present Social Value (NPSV).

However, the analysis provides a clear foundation for understanding capital investment requirements and associated benefits. A comprehensive assessment capturing operating expenditure and wider societal benefits to derive a Net Present Social Value would be a valuable next step.

12.2.2 Price base, discounting and time horizon

All costs and benefits are presented in constant 2025 prices (real terms). Historic and nominal inputs are converted to 2025 using the Office for Budget Responsibility (OBR) GDP deflator. Discounting follows the HM Treasury Green Book (2026) social discounting schedule to convert future streams into present values, reflecting time preference. To capture the full operational lifespan of all assets, the model extends beyond 2050 by the longest asset life.

12.2.3 Cost base assumptions

Capital costs in this assessment are based on unit costs derived from Mott MacDonald's internal cost benchmarking, supplemented by published sources such as DESNZ and other relevant industry data. To reflect uncertainty at this stage of appraisal, the Association for the Advancement of Cost Engineering (AACE) Class 4 accuracy ranges (–20% to +50%) are applied to show possible ranges, which are appropriate for early-stage, high-level estimates. This approach ensures the cost base is robust, transparent, and aligned with best practice for strategic economic assessment.

12.2.4 Bill impacts

Bill impacts reflect changes in energy consumption gas and grid electricity, only. Household expenditure on maintenance, servicing, or replacement is excluded. Bill impacts are presented in economic appraisal terms (net of tax, and discounted).

12.2.5 Benefits associated with EV ChargePoint investment

EV charge points have the potential to generate benefits through enabling the displacement of Internal Combustion Engine (ICE) vehicles, thereby generating reductions in carbon emissions, improvements in air quality, and lower energy bills. However, the extent to which the provision

of charge points directly drives EV uptake is highly uncertain. As a result, the potential benefits associated with enabling EV adoption are not included in the core assessment.

12.2.6 Treatment of gross value added (GVA)

High level estimates of the potential economic contribution from the direct creation of jobs associated with fitting and installation of decarbonisation measures is estimated based on publicly sourced type 1 multipliers[67], assuming that there is no leakage i.e. those employed to support the transition are locally employed. This is a high level estimate of Gross Value Added (GVA).

12.2.7 Scenarios

Three scenarios are modelled in this appraisal: the Do nothing, 2040, and 2050. The results are presented with the 2040 and 2050 in comparison to the Do nothing to show the relative costs and benefits versus a minimum/baseline scenario.

12.3 Assumptions

12.3.1 Use of published sources

Where available, assumptions from HM Treasury's Green Book (2026) have been applied including for the discount rate, forecast energy retail price movements, and carbon emission factors. All inputs are set to 2025 prices using the Office for Budget Responsibility's (OBR) GDP Deflator[68], to reflect the 2025 base year of the model for benefits and costs. All benefits and costs are measured in millions of pounds (£m). Key assumptions used in this analysis are set out in Table 12.2.

12.3.2 Key assumptions

Table 12.2 lists the key assumptions used in the Economic appraisal.

Table 12.2: Key assumptions used in the Economic appraisal

Assumption	Description
Discount rate	A social time preference discount rate of 3.5% and a health discount rate of 1.5% per the HM Treasury's Green Book (2026).
Carbon price	The HM Treasury's Green Book (2026) 'Medium' carbon price profile escalated to 2025 values using OBR's GDP deflator.
Domestic utility prices (electric, gas)	Ofgem energy price cap with future prices aligned to HM Treasury's Green Book (2026) price forecast escalated to 2025 values using OBR's GDP deflator.
Non-domestic utility prices (electric, gas)	HM Treasury's Green Book (2026) long run variable cost (LRVC) price forecast escalated to 2025 values using OBR's GDP deflator.
Road fuel prices	The HM Treasury's Green Book (2026) 'Medium' road fuel price Long Run Variable Cost profile escalated to 2025 values using OBR's GDP deflator.
Carbon emission factors	The HM Treasury's Green Book (2026) long run marginal carbon emission factors.
Gross value added (GVA)	**Output per job figure for the construction industry provided by ONS escalated to 2025 values using OBR's GDP deflator.**

Source: UK GOV, Ofgem, ONS, OBR

[67] Sustainable Transition Effects on Labor Market, Sustainable Development Solutions Network, Available at: https://www.jstor.org/stable/pdf/resrep29195.3.pdf

12.4 Detailed results

12.4.1 Capital expenditure

Capital expenditure (capex) is presented in two ways:

- **Undiscounted capex is provided to show the total financial outlay required to 2050 in today's prices**, without adjustments for risk or the time value of money.
- **Discounted capex is presented to show the adjusted capex value reflecting the time value of money**, for economic analysis and in line with HM Treasury Green Book best practice. This applies the Green Book social time preference of money discount rate.

All capex is presented as the additional spend above the Do-Nothing scenario, which assumes minimum building fabric improvements to achieve MEES EPC compliance and minimal levels of electric vehicle uptake.

12.4.2 Undiscounted capex

Undiscounted capex informs how much might be needed to be invested in today's prices, without reducing future spend for the time value of money (discounting) or increasing for inflation. These values are referenced in the Funding and Finance section below. Table 12.3 below shows the total undiscounted capex, which is identical between the two scenarios.

- **£6.5 bn in today's prices is required** to deliver both net-zero scenarios.
- All capex figures are shown as incremental to the Do-nothing scenario, representing the additional investment required over and above a baseline.
- **The only difference between the two scenarios is the timing of the installations:** while the total number of installations remains the same, the 2040 scenario assumes significantly earlier installations. This will require rapid scale up of supply chains, high levels of consumer adoption and ongoing policy support.
- **The largest areas of expenditure are deep fabric retrofit and air source heat pumps:** These account for nearly 70% of total capital expenditure. To achieve this level of investment the benefits of these measures must be clearly articulated and supported by continued government grants.

Table 12.3: Undiscounted capex vs Do nothing, £' m (2025, undiscounted)

	2040 (£' m)	2050 (£' m)	% of total (2050)
Light fabric retrofit	271	271	**4%**
Deep fabric retrofit	3,320	3,320	**51%**
Domestic solar PV	915	915	**14%**
Non-domestic solar PV	355	355	**6%**
Domestic air source heat pumps	771	771	**12%**
Non-domestic air source heat pumps	419	419	**6%**
EV chargers	406	406	**6%**
Total	**6,457**	**6,457**	**100%**

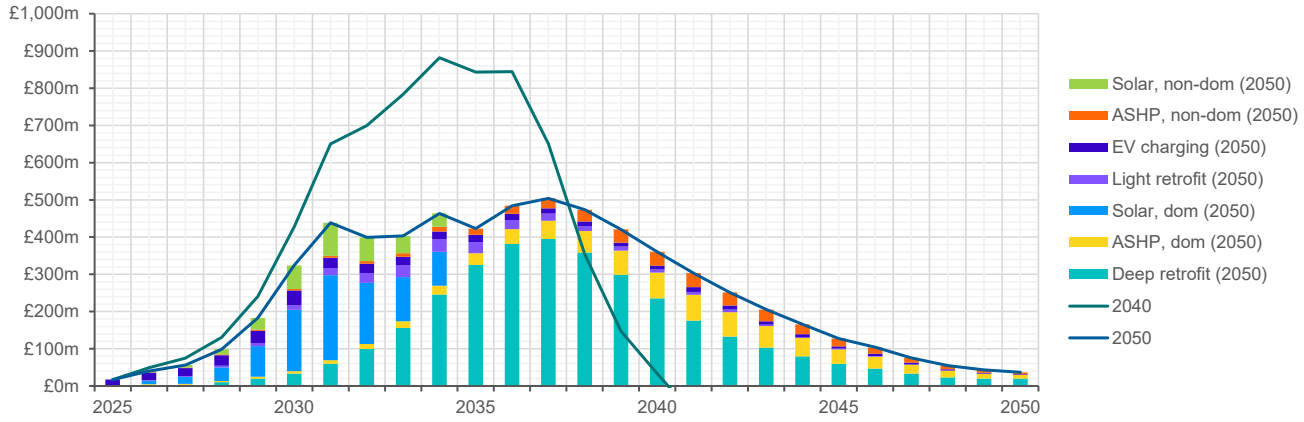
Early strategic assessments have uncertainty over future costs, therefore interval ranges have been applied to illustrate a possible range of investment, reflecting the AACE Class 4 expected accuracy ranges:

- **An upper confidence interval of +50%**, reflecting the potential for cost escalation due to unforeseen scope changes, market volatility, or design evolution.
- **A lower confidence interval of -20%**, accounting for potential cost efficiencies or scope reductions.

Figure 12.1 illustrates the capex timing profiles for the 2040 and 2050 scenarios. In the 2050 scenario, capital expenditure is broken down by intervention, showing the deployment timeline for each technology. This allows for a direct comparison with the 2040 scenario, which is presented as a single aggregated capex curve.

- **The 2040 scenario assumes much faster deployment rates:** all investment is concluded by 2040, compared to 2050. This assumes all investment over the next 14 years, rather than the next 24 years.
- **The acceleration and peak of investment is much greater in the 2040 scenario:** to achieve the earlier targets, the 2040 scenario assumes rapid scale up of investment with a peak at £882m per year, compared to a slower scale up and peak at £504m a year in the 2050 scenario.
- **Solar and EV chargers lead investment in early years** under both scenarios, with retrofit and ASHP gathering momentum through the 2030s.
- **Achievement of the 2040 scenario relies on accelerating investment in ASHPs and retrofit:** this will be aided by sustained grant support, reduction in electricity prices, and supply chain maturity.

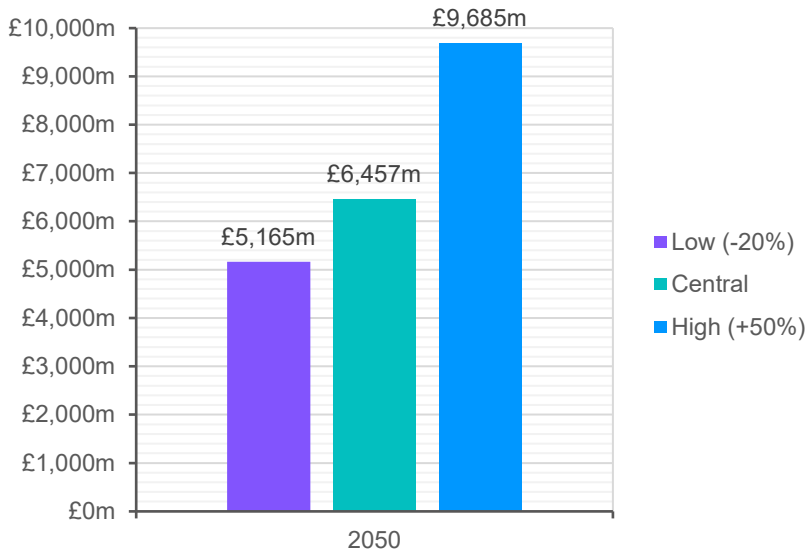
Figure 12.1: Capex, £' m, real, 2025, undiscounted



Early strategic assessments have uncertainty over future costs, therefore interval ranges have been applied to illustrate a possible range of investment, reflecting the AACE Class 4 expected accuracy ranges:

- **An upper confidence interval of +50%**, reflecting the potential for cost escalation due to unforeseen scope changes, market volatility, or design evolution.
- **A lower confidence interval of -20%**, accounting for potential cost efficiencies or scope reductions.

Figure 12.2: 2050 Capex, vs Do nothing with confidence intervals, £' m, real, undiscounted, 2025



12.4.3 Discounted capex

Discounted capex illustrates how timing impacts the value of capex and should be considered when appraising capital costs against other costs and benefits. The further the spend occurs in the future, the lower its valuation for the purposes of economic appraisal. This is presented in Table 12.4.

The effect of discounting reduces the present value of capital expenditure to £4.9 bn (2040) and £4.4 bn (2050). This is the relevant basis for comparing to other discounted of costs and benefits.

While the 2050 capital expenditure is lower, the potential benefits from this spend will also be valued lower due to the impact of discounting.

The slower pace of investment in the 2050 scenario reduces the valuation of capital costs by 10%, with slower deployment in all categories resulting in a lower valuation of cost.

Table 12.4: Discounted capex, vs Do nothing £' m (2025, discounted)

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Light fabric retrofit	214	194	4%
Deep fabric retrofit	2,402	2,163	49%
Domestic solar PV	742	742	17%
Non-domestic solar PV	288	288	7%
Domestic air source heat pumps	597	463	10%
Non-domestic air source heat pumps	303	251	6%
EV chargers	345	309	7%
Total	**4,892**	**4,410**	**100%**

12.4.4 Carbon impacts

The value of carbon savings is calculated by multiplying the value of carbon saved per intervention by carbon valuation rates per tonne of CO2e per the HM Treasury Green Book[69]. Both scenarios deliver over £1.0 billion of carbon savings compared to the counterfactual. These are presented in Table 12.5 and Figure 12.3, with the following key findings:

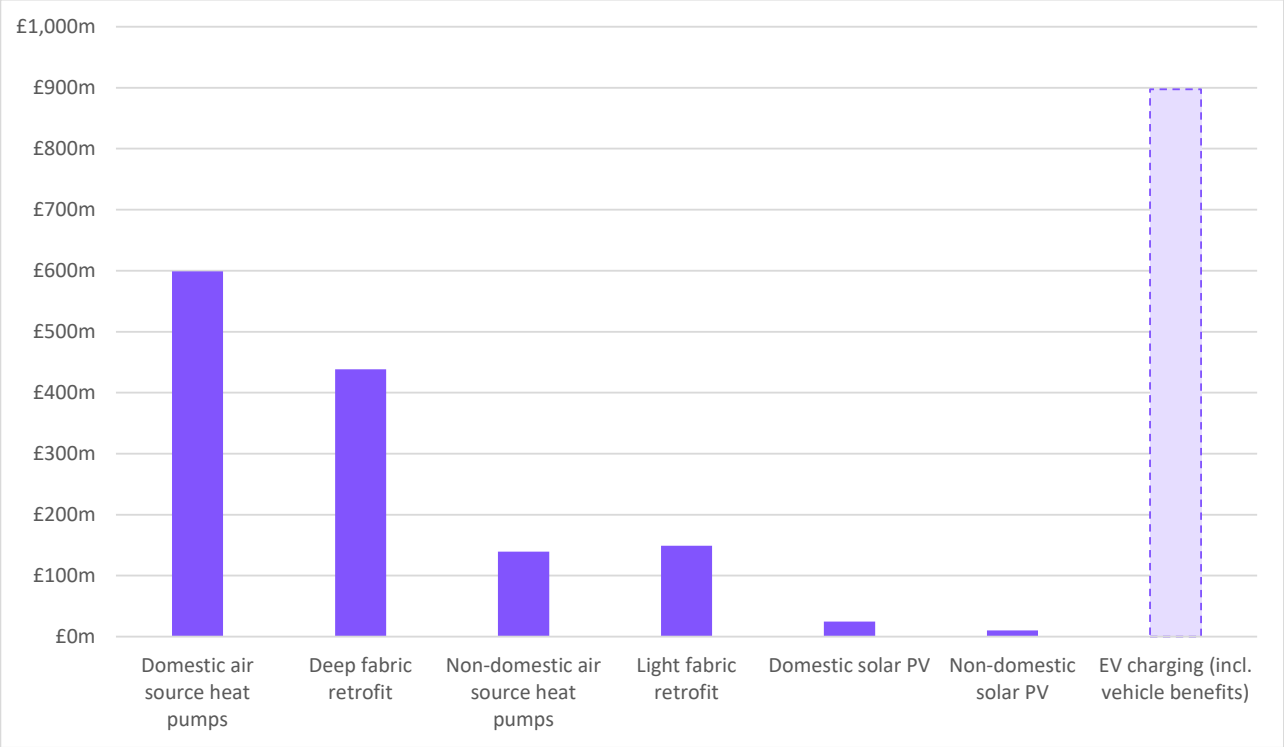
- **Early action drives greater carbon savings.** The 2040 scenario delivers greater carbon savings than the 2050 scenario (approximately £1.7 billion versus £1.4 billion), largely due to earlier deployment of key technologies like air source heat pumps and deep fabric retrofit. This means that accelerating implementation can yield stronger environmental benefits.
- **Domestic and non-domestic air source heat pumps are the most impactful intervention:** heat pumps are responsible for 54-60% of carbon savings in both scenarios, contributing between £738 million and £1,029 million in benefits.
- **EV charging could enable substantial carbon savings.** Even though installation of chargers does not directly create carbon savings, the vehicle emission reductions that could be enabled are very significant. When vehicle benefits are included, EV charging could become the largest contributor to carbon savings (£1,049 million in 2040 and £897 million in 2050).
- **Solar PV has very low impact on carbon reduction,** as the electricity grid is assumed to decarbonise through the coming decade. The benefits of PV will come through impact on bills and energy security, not through carbon reduction.

Table 12.5: Carbon impacts, vs Do nothing £m (2025, discounted)

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Light fabric retrofit	161	149	11%
Deep fabric retrofit	477	439	32%
Domestic solar PV	25	25	2%
Non-domestic solar PV	10	10	1%
Domestic air source heat pumps	834	599	44%
Non-domestic air source heat pumps	195	140	10%
EV charging (excl. vehicle benefits)	-	-	-%
Total	1,701	1,361	100%
EV charging (incl. vehicle benefits)	**1049**	**897**	

[69] Department for Energy Security and Net Zero, 2023, Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal available at: Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK

Figure 12.3: Valuation of carbon benefits, 2050 scenario vs Do nothing, £' m (2025, real, discounted)



12.4.5 Air quality improvements

Air quality improvements are assessed considering the change from fossil fuel heating and transport to electric sources. The change in fuel use is valued as an air quality improvement applying HM Treasury indices for air quality[70]. Air quality improvements carry less significant benefits for both scenarios compared to other types of impacts. These are shown in Table 12.6.

- **Air source heat pumps deliver small air quality gains:** air source heat pumps improve air quality a modest amount, with improvements increasing the earlier ASHPs are installed.
- **Enabling EV uptake could stimulate further air quality improvements.** Although EV charging infrastructure does not directly cause EV displacement of ICE vehicles, the vehicles supported could create benefits of a further £56 million to £66 million in improvement in air quality.
- **Many of the technologies were not assessed for air quality improvements**, as their impact on local emissions is negligible, as their installation does not directly impact human exposure to airborne pollutants, in the LAEP area. For instance, rooftop solar PV replaces grid electricity, which is often generated outside the region. As a result, any potential air quality benefits would not directly apply to the area.

Table 12.6: Air quality improvements, vs Do nothing £m (2025, discounted)

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Light fabric retrofit	N/A	N/A	N/A

[70] Department for Energy Security and Net Zero, 2023, Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal available at: Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Deep fabric retrofit	N/A	N/A	N/A
Domestic solar PV	N/A	N/A	N/A
Non-domestic solar PV	N/A	N/A	N/A
Domestic air source heat pumps	18	12	81%
Non-domestic air source heat pumps	4	3	19%
EV charging (excl. vehicle benefits)	N/A	N/A	N/A
Total	22	15	100%
EV charging (incl. vehicle benefits)	**66**	**56**	

12.4.6 Impact on bills

Substantial energy bill savings could result from the transition. Discounted values are presented in Table 12.7, excluding VAT and tax.

The 2050 scenario delivers a slightly greater reduction in bills (£931 million) compared to the 2040 scenario (£904 million) due to the timing of asset installations. While there are lower savings from generation in the 2050 scenario, there are also lower additional costs from ASHPs.

- **Generation technologies deliver significant bill savings:** Rooftop solar PV installations are projected to deliver bill savings of £581 million for domestic and £175 million for non-domestic. These savings represent the avoided purchase of electricity from the grid.
- **Heating technologies risk increasing bills:** if consumers switch to ASHPs with flat rate tariffs at current average and forecast prices, they risk increasing energy bills on aggregate because the cost of electricity over gas outweighs efficiency gains. These are shown as a bill increase in the table below.
- **Air source heat pump bills can be reduced by use of bespoke tariffs** linked to the hours of use (time-of-use tariffs). This impact is not reflected below but is a key enabler to make the case for the adoption of ASHPs, alongside pairing with renewable generation.
- **Cost of EV charging is sensitive to tax impacts and method of purchase of fuel:** adoption of electric vehicles enabled by public infrastructure yields higher bills valued at £108 million to £127 million. However, this cost is likely to change into a saving if the impact of the significant taxes on petrol and diesel fuel is also considered. These are excluded in this analysis, to reflect Green Book guidance on economic benefits valuation.

Table 12.7: Impact on bills, vs Do nothing, £m (2025, discounted)

Note – figures in black are a bill saving. Figures in (red) are a bill increase.

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Light fabric retrofit	82	74	8%
Deep fabric retrofit	236	212	23%
Domestic solar PV	581	581	62%
Non-domestic solar PV	175	175	19%
Domestic air source heat pumps	(155)	(102)	(11%)
Non-domestic air source heat pumps	(14)	(9)	(1%)

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
EV chargers	-	-	-
Total	904	931	100%
EV charging (incl. vehicle benefits)	**(127)**	**(108)**	

12.4.6.1 Impact on bills sensitivity analysis

Sensitivity analysis assesses the impact of energy price volatility, which is an important consideration given the unpredictable nature of energy markets. The analysis involves adjusting gas and grid electricity prices using the low, medium, and high trajectories outlined in HM Treasury's Green Book. Two scenarios are assessed and presented in Table 12.8.

- **Favourable scenario (A):** High gas price, and a low grid electricity price
- **Unfavourable scenario (B):** Low gas price, and a high grid electricity price

Results

- **The favourable scenario leads to further bill savings of £394m** (+42%) for the 2050 scenario. Under this scenario, total savings reach £1,325 million.
- Under the favourable scenario, ASHPs and EV chargers now save bills, due to lower electricity prices.
- **Under the favourable scenario, solar PV savings are lower,** as savings vs retail prices are lower. However, these reductions are offset by the bill savings from ASHPs.
- **The unfavourable scenario leads to lower bill savings, by £168m** (-22%) for the 2050 scenario. Total savings are still positive, but lower at £728 million.
- **In the unfavourable scenario, the dynamics reversed.** A high electricity price made rooftop solar PV more beneficial. However, air source heat pumps suffered a significant decline in performance due to both higher running costs and the reduced benefit of offsetting now cheaper gas.

Table 12.8: Impact on bills sensitivity analysis, 2050 vs Do nothing, £m (2025, discounted)

Intervention	Impact on bills (£' m)			Variance to central assumptions (£' m)	
	Central	A	B	A	B
Light fabric retrofit	74	116	52	+42	(22)
Deep fabric retrofit	212	332	147	+119	(65)
Domestic solar PV	581	546	618	(35)	+38
Non-domestic solar PV	175	165	191	(10)	+16
Domestic air source heat pumps	(102)	107	(229)	+208	(127)
Non-domestic air source heat pumps	(9)	60	(51)	+69	(42)
EV charging (excl. vehicle benefits)	-	-	-	-	-
Total	931	1,325	728	+394	(203)

Intervention			Impact on bills (£' m)	Variance to central assumptions (£' m)	
EV charging (incl. vehicle benefits)	(108)	(65)	(175)	+43	(67)

12.4.7 Employment contribution – Gross Value Added (GVA)

The creation of employment from investment delivers substantial benefits across both scenarios. These figures are indicative for the benefit across the economy as a whole. Results are presented in Table **12.9** and key findings include:

- Economic contribution ranges from an average annual value of £90 million, with aggregated figures to 2050 of £2.3 billion
- **The 2040 scenario generates slightly more benefit due to the earlier installation of assets.** As these assets require ongoing maintenance and eventual replacement up to 2050, the overall volume of installation and upkeep activity is higher, resulting in increased job creation.
- **The assets that require the most investment generate the greatest employment contribution**: deep fabric retrofit and heat pumps account for 72% of employment contribution benefits, which mirrors the similar proportion of investment required for these assets.

Table 12.9: Cumulative value of employment contribution, vs Do nothing, £'m (2025, undiscounted)

	2040 (£' m)	2050 (£' m)	% total (2050 scenario)
Light fabric retrofit	93	93	4%
Deep fabric retrofit	1,143	1,143	47%
Domestic solar PV	294	294	12%
Non-domestic solar PV	114	114	5%
Domestic air source heat pumps	451	400	16%
Non-domestic air source heat pumps	229	209	9%
EV charging	208	183	8%
Total	2,531	2,436	100%
Average per year (2025 – 2050)	**97**	**94**	

12.5 Capex - who might pay?

This section provides a view of how different capital interventions could be financed or funded to indicate where the cost of delivery may be borne by mapping interventions to funding mechanisms. The information provided is illustrative, based upon typical project examples and market dynamics.

Table 12.10: Potential funding and financing sources outlines the capital interventions identified by funding type and intervention category. It summarises probable sources of finance whether private capital, self-funding by residents or building owners, or reliance on government grants.

Table 12.10: Potential funding and financing sources

Who pays	Undiscounted capex[71]	Net Zero measure /technology	Potential funding/financing mechanisms
Private developers	£406m	EV Chargers (shared public)	Cost borne by private investment based on commercial viability
Self-funded, residents	£915m	Rooftop solar PV, domestic Private EV chargers	Self-funded Smart Export Guarantee (SEG) EV ChargePoint grant Warm Homes Plan
Grant-reliant, residents	£4,362m	Light fabric retrofit Deep fabric retrofit Air source heat pumps, domestic	Boiler Upgrade Scheme (BUS) Warm Homes Plan (ECO4)
Self-funded, public and private building owners	£355m	Rooftop solar PV, non-domestic	Self-funded Smart Export Guarantee (SEG) Local Power Plan
Grant-reliant, public and private estates	£419m	Air source heat pumps, non-domestic	Local authority and regional grants
Total	**£6,457m**		

The categorisation above is based upon experience of current market conditions and typical project performance. The categories are expanded on below for the relevant interventions:

Private developers

These technologies are assumed to be commercially viable for private developers and offer a sufficient profit incentive to attract investment. Investment is expected to come from energy developers, infrastructure funds, and private sector partnerships, with planning and grid coordination supported by local authorities.

Self-funded, residents

These interventions are considered financially viable at the household level, with market evidence that residents are investing their own capital. This is supported currently by zero VAT on solar panels and batteries, access to Smart Export Guarantee tariffs and actions for reduced capital installation costs. The financial resources available to residents is variable, (e.g. variation in household income), therefore additional support in the form of grants is likely required for some households.

Grant-reliant, residents

These interventions are considered reliant on existing grants for residents to install the intervention, as the payback is either uncertain or not significant enough to justify the capital. Existing grants could cover full or partial costs of insulation upgrades and low-carbon heating systems. Depending on the intervention, grant eligibility can be based on income, benefits, and property energy performance.

Self-funded, public and private building owners

These interventions are considered financially viable, with evidence that the public sector and businesses are investing their own capital. Rooftop solar PV installations on non-domestic

[71] Undiscounted capex refers to the net capex required under the 2040 and 2050 scenario vs the counterfactual. Undiscounted capex has been used to reflect the real-world cost of the intervention.

buildings including commercial premises, industrial facilities, and public sector assets could be self-funded by the building owners or operators.

Grant-reliant, public and private estates

These interventions are considered reliant on existing grants for residents to install the intervention, as the payback is either uncertain or not significant enough to justify the capital. Funding is expected to come from national schemes. These measures are capital-intensive and often not commercially viable without subsidy, particularly in older or energy-intensive buildings.

12.6 Funding and financing

This section explores the mechanisms available to cover upfront and ongoing costs, from non-repayable grants that reduce capital burdens to repayable finance options that leverage future revenues, as well as models that transfer risk and responsibility to third parties. It also considers the role councils can play in enabling businesses and residents to invest their own capital, ensuring that local energy projects are financially viable, equitable, and aligned with net zero objectives.

12.6.1 Non-repayable funding sources for project costs

Non-repayable funding mechanisms are typically used when projects face financial barriers that make traditional debt or equity financing impractical. They help reduce overall capital costs, making projects more affordable and attractive to investors or communities. These funds are also critical for projects where the expected financial return cannot cover full life-cycle costs, ensuring essential low-carbon or social value initiatives can proceed. Additionally, they provide upfront capital to avoid drawing heavily on reserves or savings, enabling local authorities, businesses, and residents to launch projects without compromising financial stability.

Non-repayable sources of funding are presented below, split by those available to local authorities, and businesses and residents.

12.6.1.1 Local authority

Community Infrastructure Levy (CIL)[72]

The CIL is a planning charge by local authorities in England and Wales on new developments to fund infrastructure such as transport, schools, parks, and public amenities. CIL funds can only be used for infrastructure supporting development and must comply with strict statutory regulations.

Section 106 (S106)[73]

S106 agreements are legally binding planning obligations between developers and local authorities, used to mitigate the impact of new developments by funding infrastructure, affordable housing, or community facilities. Unlike CIL, S106 is negotiated case-by-case, subject to meeting statutory tests, and can include both financial contributions and in-kind provisions tied to specific planning permissions. They remain a key tool for delivering site-specific benefits and ensuring developments are sustainable and aligned with local needs.

Great British Energy Community Fund (GBECF)[74]

[72] Community Infrastructure Levy, GOV.UK, available at: Community Infrastructure Levy - GOV.UK

[73] Section 106, GOV.UK, available at: Planning obligations - GOV.UK

[74] Great British Energy Community Fund, Community Energy England, available at: Great British Energy Community Fund - Community Energy England

The GBECF is a £5 million UK government-backed grant scheme by regional Net Zero Hubs to support feasibility and development costs for community-owned renewable energy projects. It offers up to £40,000 for Stage 1 feasibility studies and up to £100,000 for Stage 2 development work. Proposals require at least 50% community ownership and generating local benefit. The scheme was extended in 2025 for one year, and while funds are likely now allocated, it is possible that the scheme will be extended with further grant available in future years.

Public Works Loan Board (PWLB)

The PWLB is a UK government facility that provides low-cost loans to local authorities for capital projects, funded through the National Loans Fund, repayable from the overall council budget but not from the project. Councils use PWLB borrowing to finance infrastructure such as housing, transport, and regeneration, with rates typically linked to gilt yields plus a margin. It offers flexible repayment terms but requires compliance with prudential borrowing rules and restrictions on debt-for-profit activities.

Offsetting/insetting[75]

Retrofit Credits allow organisations to offset their emissions by funding energy-efficiency upgrades in social housing, generating verified carbon credits. For councils, this offers two opportunities: they can purchase credits to compensate for residual emissions and meet net zero targets, or, if they own housing stock, they can implement retrofit projects, generate credits, and sell them to corporates. The revenue can then be reinvested into further retrofits, creating an insetting effect and accelerating decarbonisation of their own assets.

12.6.1.2 Businesses and residents

Warm Home Plan[76]

The Warm Home Plan is a UK government initiative announced in 2025 to accelerate home energy efficiency and heat decarbonisation, backed by £13.2 billion of funding. It focuses on upgrading insulation, installing low-carbon heating systems, and supporting vulnerable households to reduce energy bills and emissions. The plan complements existing schemes like the BUS and ECO, aiming to deliver large-scale retrofits.

Local Power Plan[77]

The UK Government's Local Power Plan, announced in 2026, outlines £1 billion of investment for community owned energy projects through grants, loans and advice. This support is being delivered by DESNZ, Great British Energy and the National Wealth Fund through to 2030, with the purpose to support community energy groups to develop energy generation and storage projects that deliver benefits to the local area.

Great British Energy Community Fund (GBECF)

Refer to above.

Boiler Upgrade Scheme (BUS)[78]

The BUS is a government grant program in England and Wales that offers households and small businesses up to £7,500 toward replacing fossil fuel heating systems with low-carbon alternatives like air-source heat pumps. It aims to accelerate heat decarbonisation by reducing

[75] Retrofit Credits, Housing Associations' Charitable Trust, available at: Retrofit Credits - HACT

[76] Warm Homes Plan, GOV.UK, available at: Apply for the Warm Homes: Local Grant to improve a home - GOV.UK

[77] Local Power Plan, GOV.UK, available at: Local Power Plan

[78] Boiler Upgrade Scheme, GOV.UK, available at: Apply for the Boiler Upgrade Scheme: Overview - GOV.UK

upfront costs, with installers applying on behalf of customers and funding available until March 2028. The end date of this scheme poses a risk to the sustained uptake of heat pumps, and a replacement scheme or change in the capex and running costs of heat pumps is required for continued rates of adoption.

Electric Vehicle Chargepoint Grant[79]

The EV Chargepoint Grant, available to March 2027, is a UK government scheme that provides funding for installing electric vehicle chargepoints at homes and workplaces. For homeowners and renters with off-street parking as well as households with on-street parking, the grant provides up to £500 towards the cost of installing a chargepoint. Businesses, workplaces and landlords can access grants for multiple chargepoints up to a limit of £500 per socket. Under the Workplace Charging Scheme businesses can apply for grants for up to 40 sockets across all their sites with landlords able to apply for grants for up to 200 sockets across all their sites. A separate Workplace Charging Scheme is also outlined for state-funded education institutions, with grants of up to £2,000 available per chargepoint socket.

12.6.2 Repayable funding sources for upfront project costs

Repayable funding mechanisms are used when projects have a clear revenue stream but need capital upfront to bridge the gap between construction costs and future income. They provide financing where the project's financial return is sufficient to cover third-party finance costs, making them suitable for commercially viable schemes. This approach is common when the organisation retains ownership and operational responsibility for assets, ensuring control while leveraging external capital to deliver net zero infrastructure without delaying implementation.

12.6.2.1 Local authority

National Wealth Fund (NWF)[80]

The NWF is a UK government investment vehicle launched in 2024 to accelerate the transition to a green economy and boost economic growth. It channels public and private capital into strategic sectors such as clean energy, green steel, carbon capture, and advanced manufacturing, aiming to crowd in private investment and create high-quality jobs. Managed by the UK Infrastructure Bank, the fund supports projects that align with net zero goals and regional development priorities.

Local Climate Bonds[81]

Local Climate Bonds are a UK municipal investment mechanism that allows councils to raise funds for local net zero and climate projects by issuing bonds to residents and investors. They offer a low-risk, fixed-return investment, and proceeds are earmarked for projects such as renewable energy, EV infrastructure, and building retrofits. This approach promotes community engagement in climate action while providing councils with affordable finance for sustainability initiatives.

Green Bonds[82]

Green bonds are fixed-income instruments issued to raise capital specifically for projects with environmental benefits, such as renewable energy, energy efficiency, or sustainable transport. They work like traditional bonds but are earmarked for green projects. This financing tool helps

[79] Electric Vehicle Chargepoint Grant, GOV.UK, available at: Electric vehicle chargepoint grants - GOV.UK

[80] National Wealth Fund, available at: National Wealth Fund | National Wealth Fund

[81] Local Climate Bonds, Green Finance Institute, available at: Green Finance Institute

[82] Green Bonds, IMCA, available at: green-bonds-principles-june-2018-270520.pdf

governments, companies, and institutions attract investors committed to sustainability while supporting the transition to a low-carbon economy.

UK Municipal Bonds Agency (UKMBA)[83]

The UKMBA is a financing platform created to help local authorities access cheaper borrowing by issuing bonds collectively rather than individually. It pools councils' borrowing needs to achieve economies of scale and better rates compared to traditional sources like the PWLB. This approach aims to diversify funding options for infrastructure and regeneration projects while reducing reliance on central government lending.

12.6.2.2 Business and residents

Community share offers

Community share offers are a way for local people to invest in and own a stake in community-led projects, such as renewable energy, local services, or social enterprises. They raise capital by selling shares directly to individuals, often with modest financial returns and strong social or environmental benefits. This model promotes democratic ownership and keeps profits within the community while funding projects that deliver local impact.

12.6.3 Financing through third party delivery

Financing through third-party delivery is used when a private or external organisation takes responsibility for developing, funding, and operating an asset on behalf of the public or community sector. This approach transfers the need for upfront project finance and shifts operational and financial performance risks away from the commissioning body to the third party.

12.6.3.1 Local authority

Service or Concession Agreement

A service or concession agreement typically allows a private provider to finance, install, and operate low-carbon infrastructure. Examples include heat networks, EV charging hubs, or renewable generation under a long-term contract with a public authority. The provider recovers costs through user tariffs or availability payments, while the authority sets performance standards to ensure carbon reduction goals are met.

Heat as a Service (Haas)[84]

HaaS is an emerging business pilot model where customers pay for the outcome including warmth and comfort, rather than for units of energy like gas or electricity. It typically involves smart controls and service agreements that guarantee a set temperature or heating schedule, enabling providers to optimize energy use and integrate low-carbon technologies. This approach shifts incentives toward efficiency and decarbonisation, making heating more affordable and sustainable for households. Models for heat as a service are in development for both domestic and non-domestic sectors.

12.6.3.2 Businesses and residents

Heat as a Service (Haas)[85]

[83] UK Municipal Bonds Agency, available at: Home - UK Municipal Bonds Agency - UKMBA

[84] Energy as a Service Pilot Phase Evidence Report, EON, available at: Energy as a Service: final report

[85] Energy as a Service Pilot Phase Evidence Report, EON, available at: Energy as a Service: final report

As above.

Pay As You Save (PAYS)[86]

PAYS is a financing model that enables households or businesses to install energy efficiency or low-carbon technologies such as insulation, heat pumps, or solar panels without paying upfront. The cost is repaid over time through a charge on the energy bill, with repayments designed to be lower than the savings achieved, so customers see immediate net benefits.

12.6.4 Council actions to enable business and resident investment

To help businesses and residents invest their own capital in local energy projects, councils can play a vital enabling role by reducing barriers and creating confidence in returns. This often involves providing clear information on opportunities, offering technical guidance, and facilitating access to trusted suppliers or installers. Councils can also support through measures such as aggregating demand, coordinating bulk purchasing, and promoting financial incentives or accreditation schemes, all of which make investment more attractive and lower perceived risk for individuals and businesses.

Group purchase

A group purchase scheme is a collective buying model where residents/organisations pool demand for clean solutions like solar or heat pumps to secure lower costs and accelerate adoption. It reduces upfront barriers and sends strong market signals to scale decarbonisation.

The leading scheme, Switch Together, previously known as Solar Together, has recently extended from solar to also include heat pumps. Switch Together is a group purchasing scheme, coordinated by local authorities, which enables residents to install technologies at reduced rates. Suppliers compete in a reverse auction to offer the lowest price, and participating households benefit from costs typically lower than those available individually. At present, Switch Together is the only established provider of this model, but similar group purchasing approaches could be explored for other technologies such as heat pumps or battery storage.

Revolving Loan funds[87]

Revolving loan funds allow councils to provide low-cost loans for energy efficiency and renewable projects, using an upfront capital pool that is replenished as loans are repaid. These funds are typically administered by third parties such as community finance institutions or banks. While arrears are around 1%, risk can be mitigated through affordability checks and legal safeguards, making this a viable option for councils to support the able-to-pay market.

Accredited supplier lists

The council could seek to collect and publish a list of known suppliers with suitable accreditation.

Facilitate events and forums for suppliers and interested parties

The council could seek to facilitate events and forums where residents and businesses could meet with potential suppliers. The council could maintain a neutral stance by allowing all suppliers to attend who meet certain accreditation levels.

Innovation mechanisms

Council can run pilots/support innovation mechanisms such as blended finance.

[86] Pay As You Save, UK Green Building Council, available at: Microsoft Word - GBC PAYS exec sum_FINAL.doc

[87] Lendology, available at: Accessible Finance for Home Energy Improvements

12.7 Next Steps

This chapter provides a high-level assessment of the economic implications of decarbonising the area, focusing on capital investment, benefits, and funding pathways across two transition scenarios. The analysis offers a foundation for understanding the scale and impact of net-zero interventions.

To build on this work for deeper strategic decision-making, we recommend the following next steps:

Expand to a Full Cost-Benefit Analysis (CBA): Building on the current capital expenditure and benefit assessment, the next stage should incorporate operational expenditure (OPEX) and wider societal benefits, enabling calculation of aggregate Net Present Social Value (NPSV). Undertaking a full CBA will provide a more holistic and transparent view of the long-term value and trade-offs associated with net-zero investments, strengthening the evidence base for investment decisions and policy development.

Deep dive on funding and financing pathways: While this chapter sets out funding and finance pathways at a high level, a more detailed review is required. This should include in-depth modelling of funding mechanisms, sources, and delivery models for each intervention. Achieving a clear and actionable approach will require proactive stakeholder engagement working with local authorities, residents, developers, and industry partners to validate assumptions, clarify roles, and co-design effective funding solutions.

These next steps will ensure the economic case for decarbonising the area is robust, comprehensive, and tailored to local needs, providing a strong foundation for future investment and delivery.

13 Prioritisation

This section details the recommended framework for prioritising decarbonisation interventions within the Gedling, Broxtowe and Rushcliffe LAEP, identifies projects for short-term and long-term action, outlines key focus zones, and addresses dependencies and uncertainties.

13.1 Prioritisation methodology

Interventions have been prioritised through a structured multi-criteria analysis that integrates both quantitative and qualitative considerations. This process was further strengthened by insights derived from stakeholder engagement sessions, ensuring that the prioritisation reflects not only technical feasibility but also local context and stakeholder aspirations. The combined approach provides clarity on the categorisation of actions into “quick wins,” which deliver immediate and visible benefits, “enablers,” which create the necessary conditions for future progress, and longer-term strategic investments that underpin systemic transformation.

Table 13.1 summarises the core criteria applied in this analysis, including decarbonisation impact, cost-effectiveness, social equity, co-benefits, and deliverability. Overall, near-term implementations have been agreed to focus on the impact to levels of fuel poverty, use of existing funding streams that can be leveraged in the short term and taking into account the local grid readiness. The system carbon impact of implementations was not considered to be a priority as the measures collectively are set out to achieve net zero, so the feasibility of implementation in the short term was considered to be more relevant in determining short-term actions.

Table 13.1: Summary of Prioritisation Criteria

Core Criteria	What it measures	Why it matters	Ranking
Equity and fuel poverty	Extent of the measure of impact on levels of fuel poverty	Supports a just transition by ensuring vulnerable groups benefit from decarbonisation efforts	Higher
Funding availability	Access to public or private finance for implementation	Determines the likelihood of implementation and scalability, especially in resource-constrained environments	Higher
Local grid readiness	Likelihood of DNOs being able to facilitate implementation at the local level in the short term	Contributes to stable operation of the electricity network and allows time for DNOs to plan and execute necessary upgrades in constrained areas	Higher

Cost effectiveness (WLC)	Net present value / £/tCO_2e; affordability for end users	LAEP requires robust cost inputs and standardised assumptions to identify "most cost-effective combination of options"	Medium
Deliverability and readiness	Consenting, supply chain readiness, ease of installation	Ensures practical feasibility and timely deployment of measures	Medium
Local economic & health co-benefits	Job creation, reduced hospital admissions, local supply chain	Approach values wider factors beyond pure techno economics	Lower
Risk & uncertainty exposure	Technology maturity, future-proofing, reversibility	Reduces exposure to uncertainty and ensures long-term viability of investments	Lower
Carbon impact	Carbon abatement potential, including lifetime tCO_2e savings per project	Acknowledges the time-value of emissions by pursuing steep decarbonisation in the early years	Lower

13.2 Dependencies and uncertainties for interventions

Delivery of the interventions identified in the LAEP is influenced by a set of dependencies and uncertainties that shape its feasibility, timing, and overall impact. Dependencies refer to the enabling conditions or prerequisite actions that must be in place for successful delivery. These may include the availability of supporting infrastructure, alignment with regulatory frameworks, readiness of supply chains, and access to skilled labour. For example, the rollout of heat pumps may depend on grid capacity upgrades, installer training programmes, and consumer incentives.

Uncertainties, on the other hand, arise from factors that are difficult to predict or control, such as fluctuations in energy or technology costs, changes in policy direction, market behaviour, and the pace of innovation. These uncertainties can influence both the cost-effectiveness and deliverability of interventions, requiring adaptive planning and risk mitigation strategies. Recognising these dynamics is essential for sequencing actions effectively, as interventions with high dependency or uncertainty may need to be phased later or supported by enabling measures.

Table 13.2 summarises the key dependencies and uncertainties relevant to the successful delivery of this LAEP and provides a clear reference point for understanding the conditions that underpin successful implementation and the risks that must be managed to maintain progress toward long-term objectives.

Table 13.2: Summary of dependencies and uncertainties

Dependency / Uncertainty	Why it matters	Suggested mitigation
Funding	Funding availability is essential for project delivery and scalability	Identify and align with existing funding streams. Coordinate with EMCCA to explore alternative funding mechanisms and partnership opportunities. Explore public-private sector partnerships to enable access to wider expertise and funding, to accelerate delivery.
Electricity network capacity and connection queues	PV, ASHPs, EV projects depend on headroom; connection delays can defer benefits	Ongoing detailed engagement with NGED with regard to the outcomes of this LAEP and with regard to any projects that are taken forward off the back of the LAEP. Ensure targeted grid reinforcement to enable delivery of priority projects.
Energy price volatility	Operating costs (ASHP vs Gas vs Heat network)	Adopt a fabric first approach to minimise demand when switching to lower carbon solutions. Adopt local renewable generation and energy storage systems to help shift demand and reduce exposure to pricing risk. Smart local energy systems can also be considered to help manage this.
Supply chain and skills	Heat pump, insulation, delivery capacity may constrain pace	Policy considerations such as Training programmes, funding and incentives. Strategic partnerships between public and private sector. Leverage existing expertise in local community energy groups and engage with local manufacturers of heat pump technology.
Public trust and uptake	Public acceptance is essential to drive uptake	Community engagement and communication programmes to share good news stories. Work with community energy groups to support with messaging and delivery. Undertake demonstration/pilot projects to enable delivery of and showcase best practice.
Policy evolution	Changes to boiler phase out, market design or zoning rules could shift the plan	Ensure policy tracking is in place i.e. through a framework to monitor national and regional policy developments and regularly review the LAEP or subsequent project to align with these. Engage with or create local energy forums to enable collaborative adaption of plans and projects to policy changes.
Hydrogen availability/cost	The industrial decarbonisation pathway is highly sensitive to hydrogen price, electricity grid carbon intensity, and technology costs. If hydrogen remains expensive, switching high-temperature processes may be delayed or limited.	Detailed engagement with key stakeholders in this space such as East Midland Hydrogen to advise on potential hydrogen needs in the area. Maintain focus on hard-to-treat high temperature loads with more readily available technologies utilised for wider decarbonisation.

13.3 Focus Zones

Given the large scale of interventions required to achieve a net zero energy system at the local level, it is important to determine where to start the roll-out. Based on the priorities set out, ‘focus zones’ can be identified that will meet the criteria for short-term implementations. Within

these focus zones, specific schemes can then be developed by the local authorities to move towards delivery.

13.3.1 Areas with High Fuel Poverty

Fuel poverty remains a significant challenge across Gedling, Broxtowe and Rushcliffe, with all the areas reporting a higher proportion of households at risk compared to the East Midlands regional average and the English national average (Figure 6.8).

The Low-Income Low Energy Efficiency (LILEE) [88] definition of fuel poverty was introduced in 2019 which classifies a home as fuel poor if it spends more than 10% of its annual income on space heating and energy services. This is far more likely in a home rated EPC E or below due to lack of insulation and poor thermal retention capability.

The spatial distribution of fuel poverty in Gedling, Broxtowe and Rushcliffe is uneven - certain neighbourhoods experience disproportionately high rates. This disparity underscores the urgent need for targeted interventions that address energy affordability and thermal comfort. Analysis at the MSOA level indicates that neighbourhoods including Daybrook and Netherfield and Colwick in Gedling, West Bridgford in Rushcliffe and Beeston Town and Beeston North in Broxtowe exhibit the highest concentrations of households at risk of fuel poverty, as well as a significant proportion of homes with an EPC rating of D or below. Notably, stakeholder engagement sessions and discussions with the Gedling, Broxtowe and Rushcliffe LAEP Steering Group revealed that not all households within these MSOAs are typically recorded as having lower than average socio-economic status. Since this is one of the main variables in determining whether a household is fuel poor or not alongside building age and EPC rating, it must be assumed that other factors exist to influence this counter-trend such as a higher student population, or a high prevalence of historic and less energy efficient buildings, meaning a nuanced approach must be taken.

Focusing retrofit programmes on these zones offers significant benefits. Fabric-first measures, including improved insulation, airtightness, and glazing upgrades, can substantially reduce heat loss, lower energy bills, and improve indoor comfort. Beyond carbon reduction, these interventions deliver critical social co-benefits: alleviating fuel poverty, improving health outcomes, and reducing financial stress for vulnerable households. Figure 13.1 and Figure 13.2 below illustrates the average risk of fuel poverty per households and the percentage of homes below EPC C respectively.

[88] Department for Energy Security and Net Zero, *Fuel Poverty Methodology Handbook 2025: Low Income Low Energy Efficiency (LILEE)* (UK Government, 2025)

Figure 13.1: Average risk of fuel poverty per household by MSOA

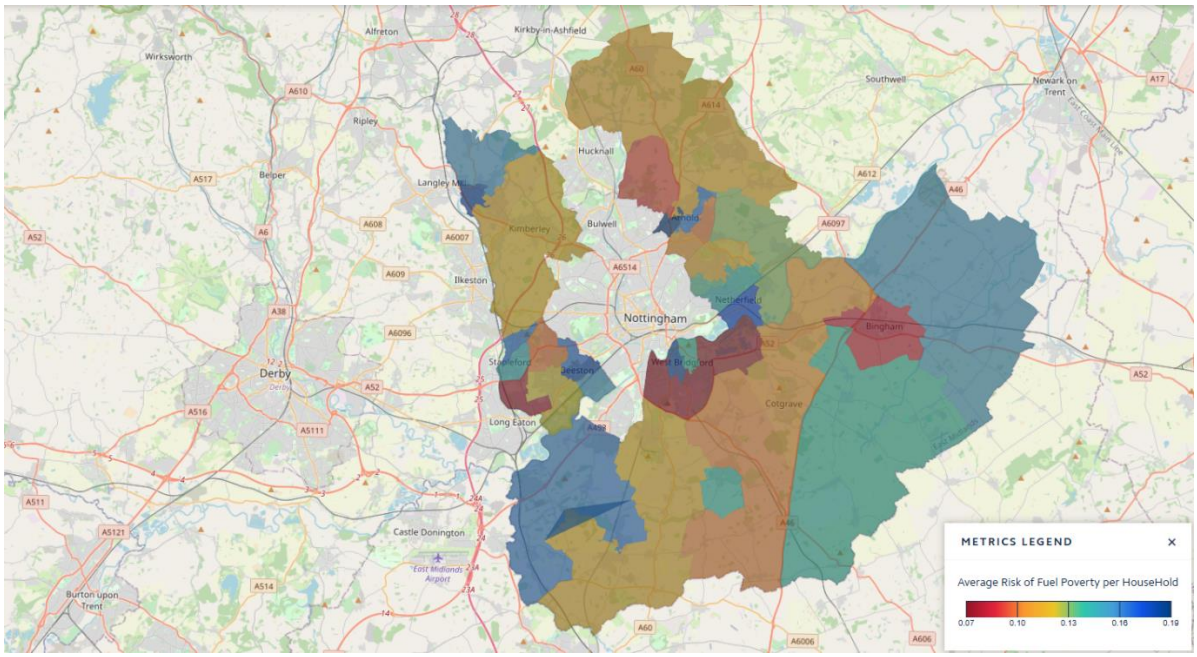
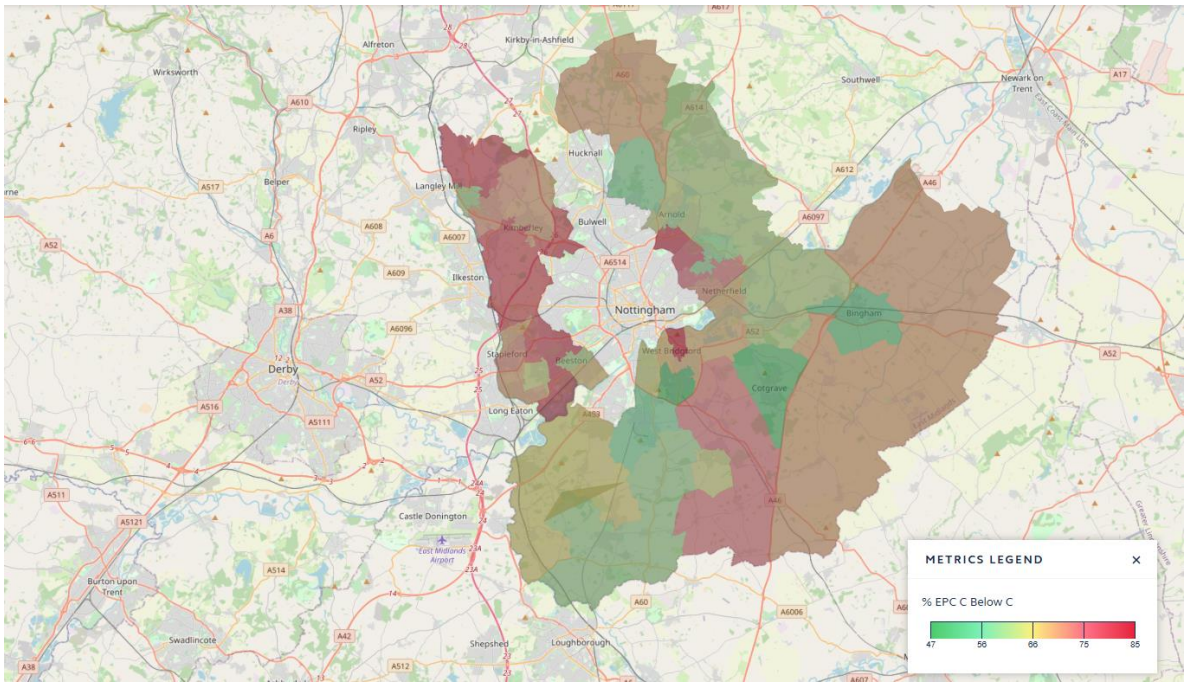


Figure 13.2: Percentage of households below EPC C by MSOA



13.3.2 Electricity Headroom Pockets

Electricity network capacity is a key determinant of where electrification measures, such as heat pump deployment, can be accelerated. Analysis of grid utilisation across GBR identifies pockets of available headroom where additional electrical load can be accommodated without immediate reinforcement. These areas represent prime opportunities for early heat pump rollout and other electrification measures, as they can be delivered with minimal infrastructure upgrades, reducing cost and complexity.

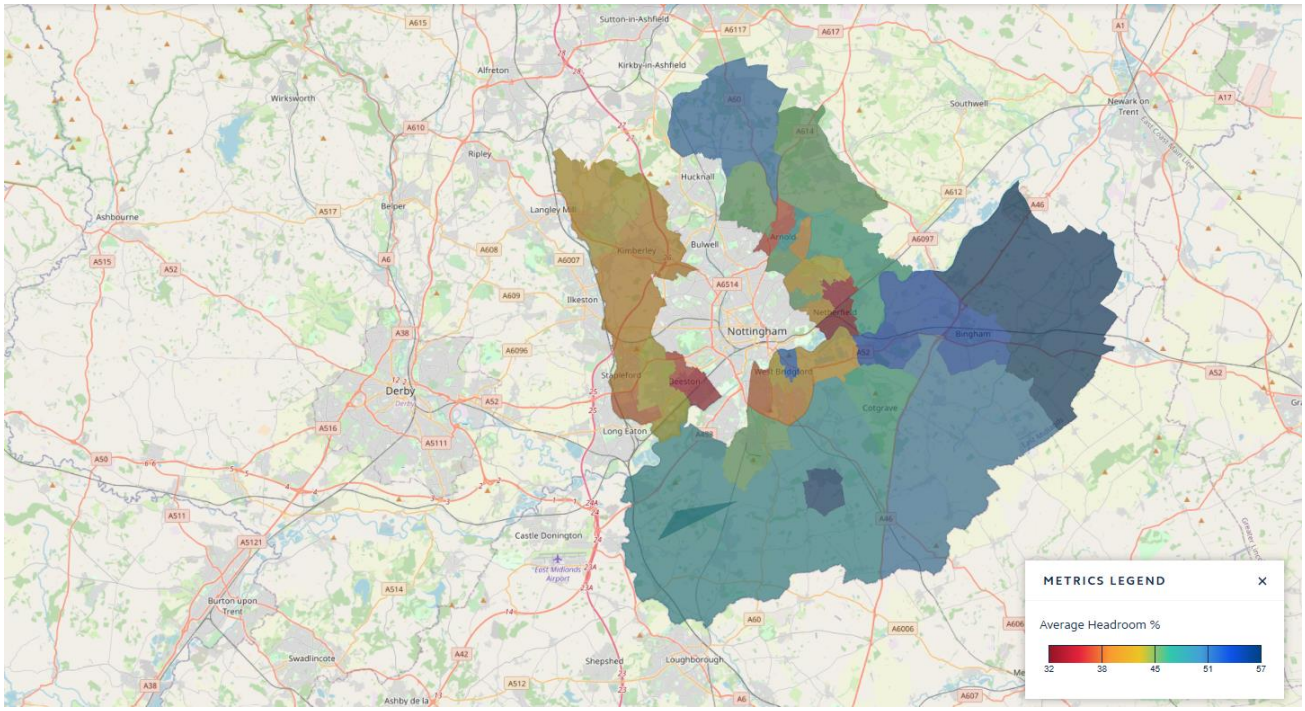
Demand headroom

Keyworth South, East Bridgford and Aslockton and Lady Bay in Rushcliffe all have more than 40% headroom availability, making them ideal for early deployment.

Areas with low headroom require a different approach. In these zones, demand-side response (DSR) strategies should be prioritised to manage peak loads and defer costly reinforcements such as in Netherfield and Colwick in Gedling and Beeston Rylands in Broxtowe. DSR measures may include PV paired with battery system. These interventions enhance flexibility, as we prepare the network for future electrification.

Figure 13.3 provides a spatial representation of average grid headroom, supporting evidence-based decision-making.

Figure 13.3: Average electricity headroom percentage by MSOA



This suggests a focus on energy efficiency and DSR delivery in this area in the short term, in conjunction with conversation with NGED, Electricity Northwest and Northern Powergrid around the timeline for accessing additional headroom in this area.

Further detailed engagement with local DNOs will be required to determine viable timescales for delivery as projects are developed in more detail, ensuring that planned interventions align with network reinforcement schedules and operational constraints and support a coordinated and efficient rollout of electrification measures. The analysis undertaken here is based on MSOA boundaries, which do not directly match with the electricity network operational boundaries, so verification of headroom with the relevant DNOs will be key in the early stages of defining delivery schemes.

13.3.3 Heat network zones

Certain building typologies across GBR such as high-density residential blocks, mixed-use developments, tower blocks, and clusters of public buildings, are particularly well-suited for communal heating solutions. These areas present opportunities to deploy shared heating

infrastructure that achieves economies of scale, lowers per-unit costs, and maximises energy efficiency.

Small-scale communal heating systems work best in compact, high-density zones where multiple buildings or dwellings are located close together. They offer a scalable pathway for delivering low-carbon heating across these developments.

Such systems can utilise ground source heat pumps (GSHPs) or air source heat pumps (ASHPs).

13.3.4 Rapid roll out of ASHPs in low-complexity properties

Rapid roll out of ASHP should be prioritised in properties that present low installation complexity, specifically those with EPC ratings of C or above and minimal retrofit requirements as shown in Figure 13.2. These properties provide an ideal environment for early deployment because they require fewer preparatory measures, reducing installation time and cost. Targeting areas with lower grid constraints further enhances feasibility by ensuring that additional electrical load can be accommodated without immediate reinforcement. These roll outs will help build installer capacity, generate measurable performance data under real-world conditions, and inform best practice for future large-scale rollouts. They will also address current stakeholder concerns around ASHP, accelerate market confidence in heat pump technology, and create a robust evidence base to support city-wide scaling.

Keyworth South, East Bridgford and Aslockton and Lady Bay in Rushcliffe all have more than 40% headroom availability, making these MSOA areas prime candidates for early roll out.

Rushcliffe's strong connectivity to the gas grid and relatively low number of off-gas properties has historically supported widespread use of individual gas boilers. While this infrastructure has contributed to a uniform reliance on gas heating, and the highest residual gas emissions among the three boroughs, it also presents a clear opportunity for targeted decarbonisation. Given this context, it is more appropriate to focus on low-carbon heating options tailored to individual properties particularly through the maximised deployment of ASHP for domestic buildings. This approach aligns with the borough's housing typology and offers a scalable pathway to decarbonisation, especially when paired with insulation upgrades and fabric first retrofit strategies. Future opportunities may emerge through targeted zoning or public sector decarbonisation, but these are likely to be site-specific rather than borough-wide.

13.4 Quick Win Projects

Quick wins represent a category of interventions that can be implemented immediately with minimal complexity and high confidence in successful delivery. These actions are often described as "no regrets" because they rely on existing evidence, proven technologies, and established funding routes, making them low-risk and highly practical. They deliver immediate carbon savings, are highly cost-effective, and offer visible progress that builds momentum for more complex programmes. Quick wins also generate wider benefits such as reduced operational costs, improved system efficiency, and enhanced social and economic outcomes. Their prioritisation is underpinned by high scores for system carbon impact, cost-effectiveness, and deliverability, while also addressing equity and co-benefits where possible.

13.4.1 Rooftop Solar PV on Public Estate Buildings

Installing rooftop solar PV systems on suitable public estate buildings, paired with battery storage where viable, presents an immediate opportunity to decarbonise public sector operations. This intervention focuses on sites with consistent daytime energy loads, making effective use of existing roof space for on-site renewable generation. By reducing grid dependency and lowering operational costs for public services, it delivers strong technical and

economic benefits. This measure scores highly on carbon impact, cost-effectiveness, and deliverability, while also performing well on network impact by optimising grid flexibility. In addition, it offers local economic co-benefits through job creation in installation and maintenance and demonstrates visible leadership that can encourage wider adoption.

Table 13.3: Summary of public estate buildings with energy demand baseline and anticipated PV generation requirement

Local Authority	Primary Use Type	Number	Total Energy demand Baseline (MWh/yr)
Gedling	Commercial & Retail	1025	47,827
	Education & Childcare	153	5,788
	Health & Care	9	1,007
	Public, Community & Culture	82	6,763
	Industrial, Logistics & Infrastructure	215	18,006
Broxtowe	Commercial & Retail	1216	62,441
	Education & Childcare	157	7,079
	Health & Care	23	1,519
	Public, Community & Culture	103	5,374
	Industrial, Logistics & Infrastructure	320	45,155
Rushcliffe	Commercial & Retail	1696	59,088
	Education & Childcare	189	13,785
	Health & Care	20	4,204
	Public, Community & Culture	144	6,439
	Industrial, Logistics & Infrastructure	270	67,137

13.4.2 Fuel Poverty led private housing retrofit

Targeting fuel-poor households through private and social housing retrofit programmes, such as the Warm Homes Social Housing Fund, addresses both climate and social equity objectives by improving building fabric and thermal efficiency. This intervention not only cuts emissions but also addresses energy affordability, reducing household bills and improving health outcomes for more vulnerable residents. Targeting retrofit of privately-owned buildings could offer support to households where the lowest EPC ratings are seen, yet also the lowest availability of funding. The opportunity to deploy deep and light retrofit measures simultaneously with ASHPs was also noted as an option to reduce disruption.

13.4.3 Light Retrofit Measures

Light retrofit measures, including cavity wall insulation and loft insulation top-ups, represent low-cost, high-deliverability actions that can be implemented relatively quickly across the able-to-pay market. These measures improve energy efficiency, reduce running costs, and create immediate co-benefits such as improved comfort and lower energy bills. However, the speed of rollout depends on addressing common barriers such as homeowner awareness, upfront costs, and trust in installers. While these measures are technically straightforward, homeowners and landlords may choose not to invest without clear incentives or support.

To enable rapid uptake, each borough council can play a proactive role in creating an environment that encourages action. This could include launching targeted awareness campaigns to highlight the benefits of retrofit and the availability of funding or incentive schemes, as well as providing a centralised one-stop-shop for advice and guidance on retrofit options, costs, and potential savings. Establishing and promoting a list of council-approved installers would help build consumer confidence and reduce perceived risks associated with quality and reliability. In addition, signposting to financing options such as grants, low-interest loans, or national schemes can help overcome concerns about upfront costs.

13.4.4 Small Roof-mounted PV and Battery Storage Installs

Small roof-mounted PV installations on suitable homes offer a scalable solution for household-level renewable generation. We modelled the uptake and estimated costs of these systems alongside domestic battery storage, assessing their potential contribution to local energy generation and flexibility. This measure empowers residents to participate in the energy transition, reducing reliance on fossil fuels and enhancing energy resilience. It performs strongly on system carbon impact and cost-effectiveness and deliverability. Co-benefits include increased energy independence and potential local economic gains through installation activity.

As with other homeowner-led measures, uptake depends on motivation and overcoming barriers such as upfront costs, lack of awareness, and trust in installers. The example enabling actions outlined in 13.5, including council-led awareness campaigns, a one-stop shop for retrofit advice, and maintaining a list of approved installers, are also relevant here. These can be complemented by PV-specific initiatives such as signposting funding schemes and exploring group-buying or community solar programmes to reduce costs and increase participation.

13.4.5 Local EV Charging Hubs and on-street charging infrastructure

The rollout of public EV charging infrastructure through local charging hubs at council-owned premises, complemented by on-street charging in high-demand residential zones, offers a scalable and inclusive approach to supporting transport decarbonisation. This measure focuses on areas with limited off-street parking and prioritises neighbourhoods experiencing high fuel poverty, where access to private charging is constrained. We assessed the potential deployment, costs, and utilisation of these assets, considering their contribution to emissions reduction and equitable access to low-carbon mobility.

This measure enables residents without driveways to participate in the transition to electric vehicles, reducing transport costs over time and cutting reliance on fossil fuels. It performs strongly on carbon impact and social equity, with co-benefits including improved air quality, reduced noise, and the potential to catalyse local economic activity through installation, operation, and maintenance of charging infrastructure. Co-locating hubs at council assets (e.g. car parks, leisure centres, depots) can also unlock opportunities for smart charging and integration with local renewable generation.

Delivery depends on overcoming barriers such as upfront capital costs, grid capacity constraints, and public confidence in availability and pricing. Enabling actions include council-led spatial planning to identify priority zones, aggregation of demand to improve commercial viability, and the use of concession or partnership models with charge point operators. These actions can be supported by targeted engagement in fuel-poor communities, transparent tariffs, and coordination with wider parking and street-works programmes to minimise disruption and accelerate rollout.

13.5 Enabling Actions

Enabler projects are interventions that do not necessarily deliver the largest immediate carbon savings but are critical for unlocking future opportunities and accelerating the transition at scale. These actions create the foundational conditions required for the successful deployment of more complex or high-impact measures.

Unlike quick wins, which focus on immediate and visible benefits, enablers are strategic investments in capability, infrastructure, and market readiness. They often involve activities such as upgrading grid capacity, developing supply chains, implementing supportive policy frameworks, and investing in workforce training. For example, large-scale electrification of heating systems cannot proceed without prior investment in grid reinforcement and installer skills development, both of which are typical enabling actions.

Enablers also include interventions that address systemic barriers, such as data gaps, regulatory constraints, and financing challenges. By resolving these issues early, enabler projects reduce uncertainty and dependency risks for subsequent interventions, ensuring that future programmes can be delivered efficiently and cost-effectively. These actions often require collaboration across multiple stakeholders, including local authorities, industry partners, and community organisations, to align priorities and secure long-term commitment. In many cases, enabler projects will require coordination with Distribution Network Operators (DNOs), regional authorities such as the East Midlands Combined County Authority, and private sector actors to ensure that technical, regulatory, and financial conditions are met.

13.5.1 Electricity grid capacity outlook

Targeted grid reinforcement is a fundamental enabler for large-scale electrification and deployment of distributed renewable generation. Rising demand from heat pumps, electric vehicles and solar PV is already placing pressure on local networks, with capacity constraints presenting a material barrier to delivery. Strategic reinforcement in areas with lower existing constraints can improve efficiency, reduce costs and better align investment with future demand growth.

Local authorities have an important convening role in supporting effective planning. At a strategic level, the LAEP should be submitted to local DNOs to inform regulatory submissions, longer-term forecasting and annual updates to the Distribution Future Energy Scenarios (DFES), ensuring visibility of future demand, community energy activity and renewable ambitions.

In the short term, particularly within focus zones, local authorities should facilitate early engagement with DNOs through ‘Connections Surgeries’. These sessions enable early verification of connection feasibility at neighbourhood level, helping to manage expectations and identify potential constraints before formal applications are submitted and costs incurred. They can also help identify areas with available capacity to inform subsequent phases of delivery.

Connections Surgeries are publicly accessible and provide an opportunity to discuss technical requirements, timescales, consents and constraints with network planners. Holding these sessions at an early stage supports informed decision-making and reduces the risk of abortive work.

Developers and delivery partners should also be encouraged to use publicly available tools, including NGED’s Network Opportunity Map and the open data portals provided by Northern Powergrid and Electricity Northwest. Given the number of grid-related challenges raised during the LAEP process, ensuring awareness of these resources across local authority teams, commercial developers and community energy groups will be particularly valuable.

13.5.2 Education and Demonstrator projects

The successful delivery of the LAEP will depend on building public understanding and confidence in low-carbon technologies and retrofit measures. Education and demonstrator projects are essential to achieve this. Each borough council can lead targeted educational initiatives that explain the benefits of energy efficiency, renewable generation, and electrification, while addressing common concerns about cost, disruption, and reliability. This could involve public workshops, and online resources.

Alongside education, demonstrator projects will provide visible examples of best practice and allow residents to see successful implementations first-hand. These projects might include retrofit exemplars in council-owned housing, pilot schemes for technologies such as heat pumps and solar PV, and open-home events where early adopters share their experiences. Demonstrator projects not only help overcome scepticism but also provide valuable data and insights to inform wider rollout.

13.5.3 Local Bulk Procurement Frameworks for Retrofit and Heat Pumps

The establishment of local bulk procurement frameworks for retrofit measures, PV installation and heat pump installations is a strategic enabler that addresses cost, supply chain resilience, and delivery certainty. Aggregating demand across multiple projects and stakeholders unlocks economies of scale, reduces unit costs, and provides suppliers with greater confidence to invest in capacity. This approach also ensures consistent quality standards and accelerates market readiness for low-carbon technologies.

Bulk procurement frameworks can support smaller contractors by providing access to larger programmes, fostering local economic development and job creation. Delivery will require coordinated action between local authorities, housing providers, and private sector partners to design procurement processes that are transparent, efficient, and aligned with long-term decarbonisation objectives.

13.5.4 Targeted Grid Reinforcements

Targeted grid reinforcements are a fundamental enabler for the large-scale deployment of electrification technologies and distributed renewable generation. As electricity demand rises due to the adoption of heat pumps, electric vehicles, and rooftop solar PV, grid capacity constraints present a significant barrier to progress. Strategic reinforcement in areas with minimal existing constraints ensures that upgrades are delivered efficiently, cost-effectively, and in alignment with future demand growth.

13.5.5 Workforce Training Programmes

Workforce training programmes are critical to ensuring that the transition to net zero is supported by a skilled and capable labour force. The scale of retrofit and low-carbon technology deployment required over the coming decade far exceeds current workforce capacity, creating a risk of delivery delays and cost escalation. Investing in training programmes now will build the necessary skills base for installing heat pumps, delivering high-quality retrofits, and integrating renewable energy systems.

These programmes should be developed in partnership with industry bodies, vocational training providers, and regional authorities to ensure alignment with market needs and future demand. Workforce development not only supports decarbonisation objectives but also delivers wider economic benefits through job creation and skills enhancement.

13.5.6 Financing Mechanisms for Low-income Households

Developing innovative financing mechanisms for low-income households is essential to ensure an equitable, inclusive and just transition. Many households face significant financial barriers to adopting energy efficiency measures or low-carbon technologies, even when long-term savings are substantial. Enabler actions in this area include the creation of accessible loan schemes, targeted grant programmes, and blended finance models that reduce upfront costs and spread repayments over time. These mechanisms should complement existing national schemes while addressing local gaps in provision.

13.5.7 Funding Opportunities

The suspension of the Public Sector Decarbonisation Scheme (PSDS) has created an urgent need to identify alternative funding streams for public sector organisations. Many local authorities and public institutions operate under severe financial constraints, limiting their ability to invest in energy efficiency and renewable energy projects. An alternative funding model is urgently needed to maintain momentum in public sector decarbonisation. These should prioritise projects that deliver high-impact carbon reductions and operational savings, such as building retrofits, heat decarbonisation and renewable energy installations.

13.5.8 Industrial Decarbonisation and Hydrogen Readiness

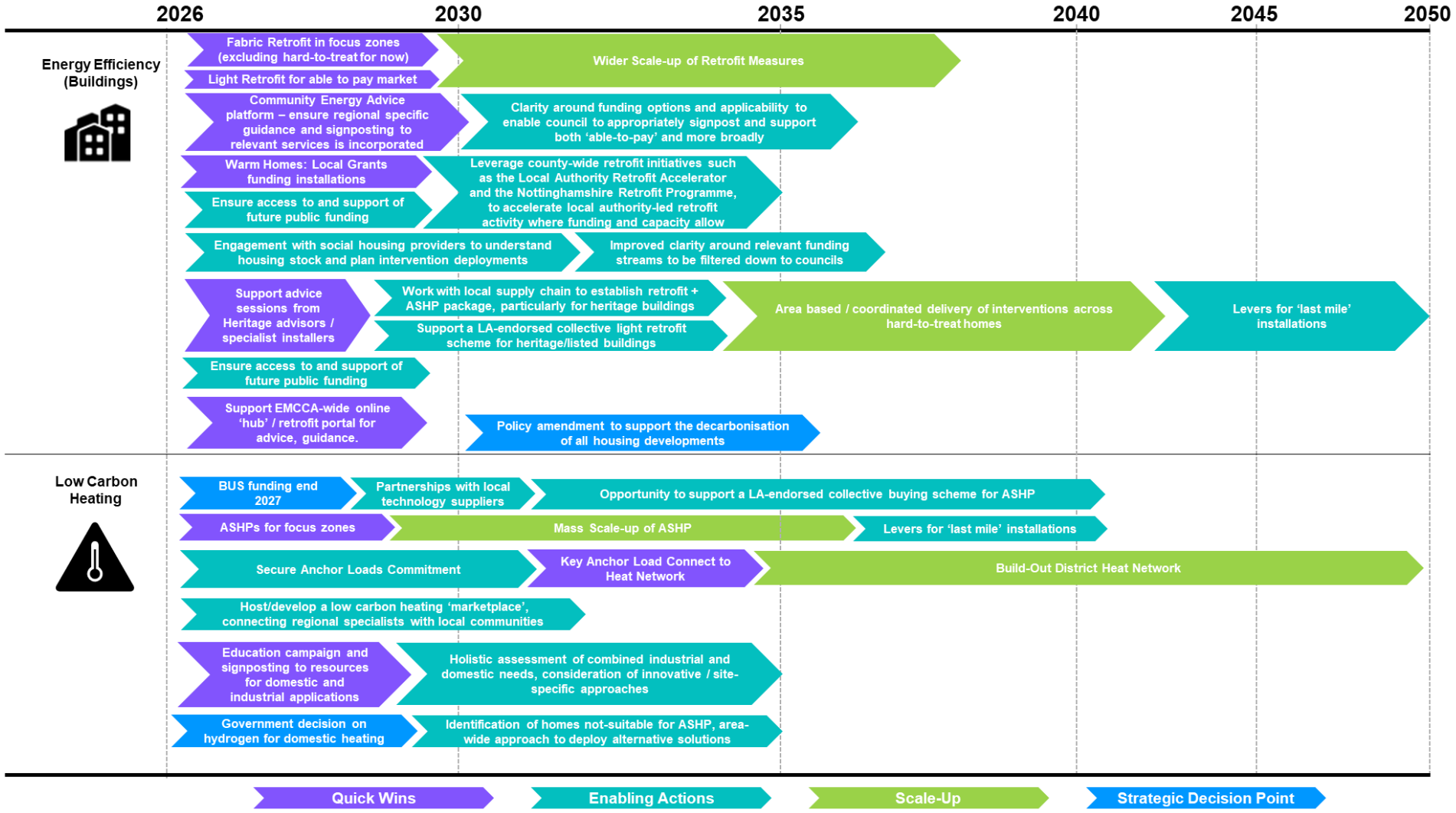
Industrial decarbonisation is essential for achieving Gedling, Broxtowe and Rushcliffe's net zero objectives while safeguarding productivity and competitiveness. The East Midlands Freeport development project is a great example of an industrial decarbonisation accelerator, focusing on skills, supply chains and economic advancements.

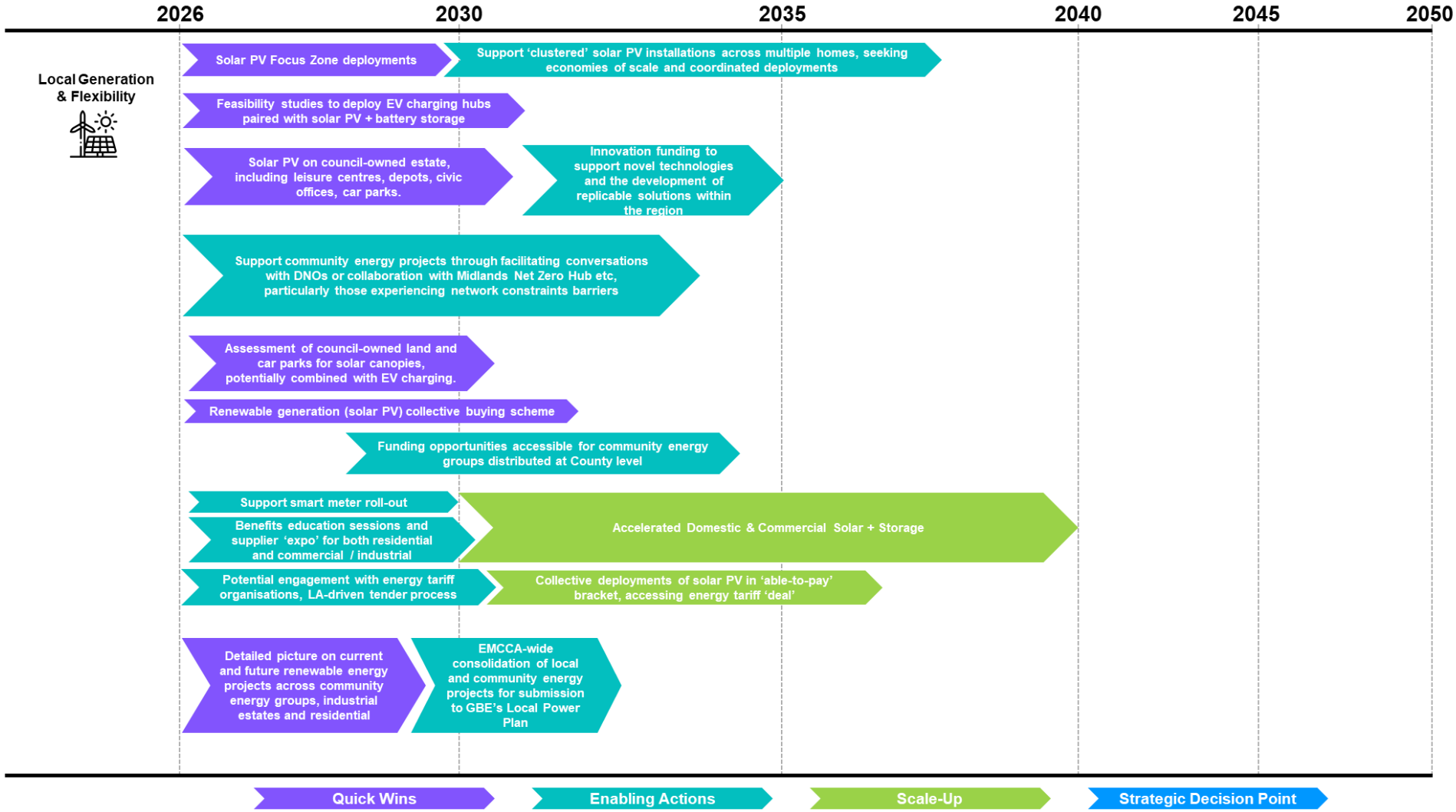
Hydrogen readiness is a critical enabling step for hard-to-abate industrial processes where direct electrification is technically challenging in the near term. Preparing demand, infrastructure, skills, governance, and finance in a coordinated manner reduces delivery risk, accelerates time to scale, and ensures that hydrogen deployment, when available at the right cost and carbon intensity, can be adopted efficiently. This measure complements a fabric-first and electrification-first approach by preserving optionality for processes that are best suited to low-carbon hydrogen in the medium to long term.

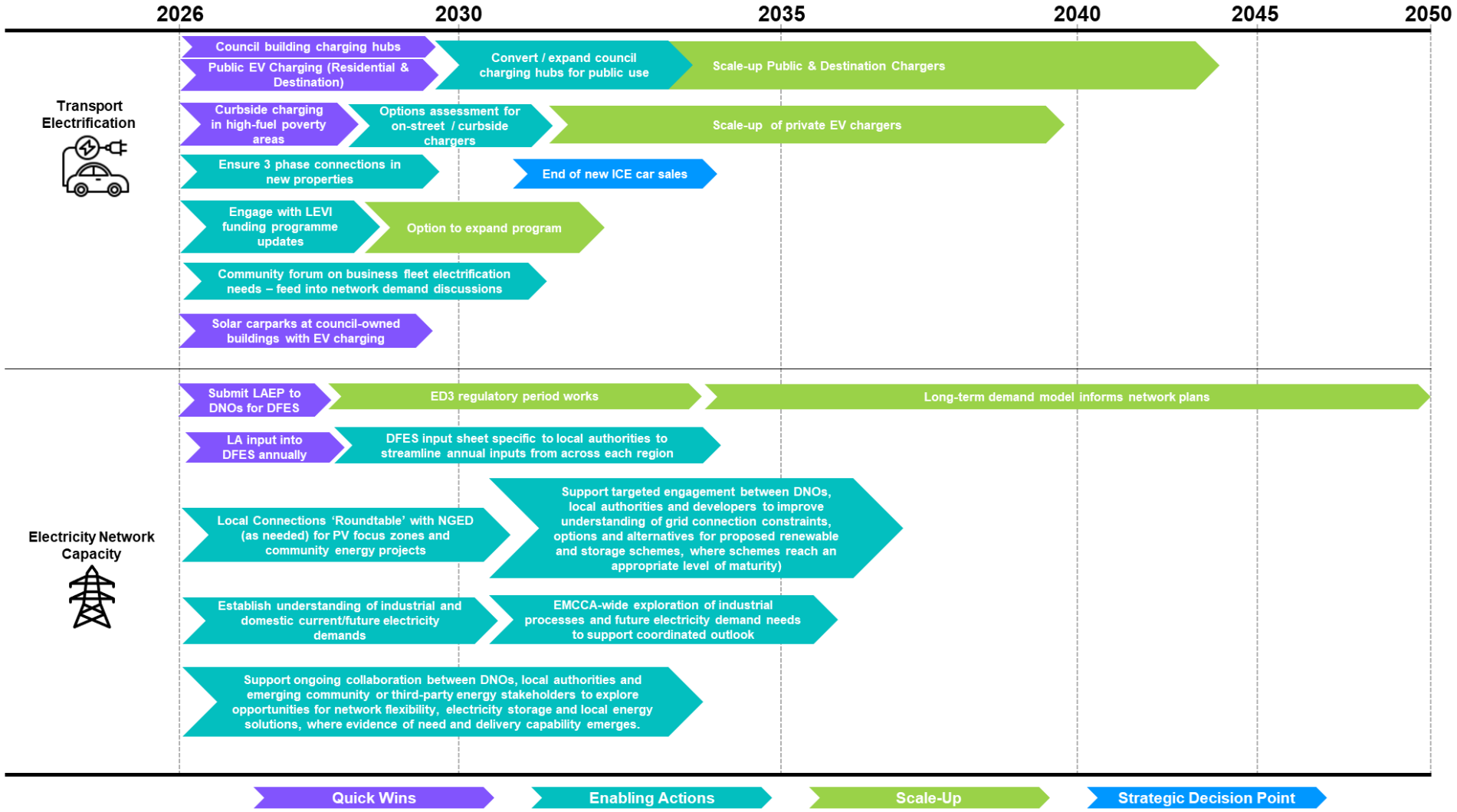
13.6 Phased Pathway

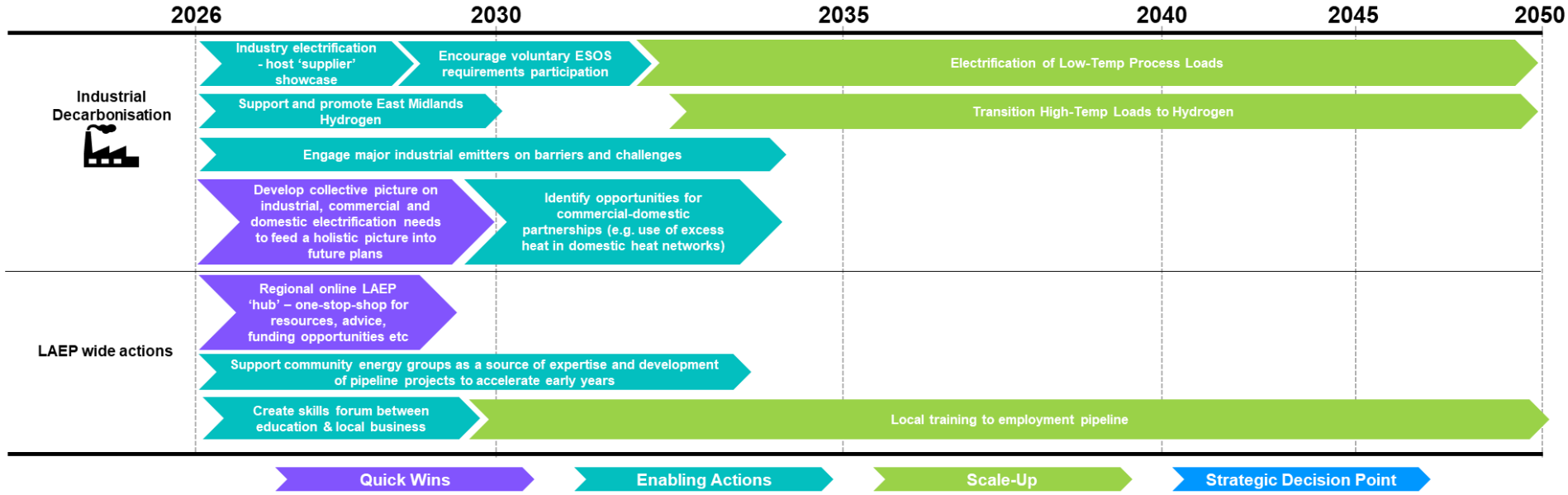
Figure 13.4 below sets out the delivery sequence for GBR's net zero interventions. Actions are phased to prioritise "quick wins" and "low regret" measures first which are cost-effective, widely supported, and deliver immediate benefits. Enabling actions and demonstrators lay the groundwork for larger-scale roll-out, while strategic decision points and uncertainties are highlighted to ensure the plan remains flexible and responsive as technologies and funding evolve. This approach maximises early impact, manages risk, and builds momentum for long-term transformation.

Figure 13.4: Delivery sequence for Gedling, Broxtowe and Rushcliffe's net zero interventions




2026
2030
2035
2040
2045
2050
Local Generation & Flexibility
Solar PV Focus Zone deployments
Support 'clustered' solar PV installations across multiple homes, seeking economies of scale and coordinated deployments
Feasibility studies to deploy EV charging hubs paired with solar PV + battery storage
Solar PV on council-owned estate, including leisure centres, depots, civic offices, car parks.
Innovation funding to support novel technologies and the development of replicable solutions within the region
Support community energy projects through facilitating conversations with DNOs or collaboration with Midlands Net Zero Hub etc, particularly those experiencing network constraints barriers
Assessment of council-owned land and car parks for solar canopies, potentially combined with EV charging.
Renewable generation (solar PV) collective buying scheme
Funding opportunities accessible for community energy groups distributed at County level
Support smart meter roll-out
Benefits education sessions and supplier 'expo' for both residential and commercial / industrial
Accelerated Domestic & Commercial Solar + Storage
Potential engagement with energy tariff organisations, LA-driven tender process
Collective deployments of solar PV in 'able-to-pay' bracket, accessing energy tariff 'deal'
Detailed picture on current and future renewable energy projects across community energy groups, industrial estates and residential
EMCCA-wide consolidation of local and community energy projects for submission to GBE's Local Power Plan
Quick Wins
Enabling Actions
Scale-Up
Strategic Decision Point


2026
2030
2035
2040
2045
2050
Transport Electrification
Council building charging hubs
Public EV Charging (Residential & Destination)
Convert / expand council charging hubs for public use
Scale-up Public & Destination Chargers
Curbside charging in high-fuel poverty areas
Options assessment for on-street / curbside chargers
Scale-up of private EV chargers
Ensure 3 phase connections in new properties
End of new ICE car sales
Engage with LEVI funding programme updates
Option to expand program
Community forum on business fleet electrification needs – feed into network demand discussions
Solar carparks at council-owned buildings with EV charging
Electricity Network Capacity
Submit LAEP to DNOs for DFES
ED3 regulatory period works
Long-term demand model informs network plans
LA input into DFES annually
DFES input sheet specific to local authorities to streamline annual inputs from across each region
Local Connections 'Roundtable' with NGED (as needed) for PV focus zones and community energy projects
Support targeted engagement between DNOs, local authorities and developers to improve understanding of grid connection constraints, options and alternatives for proposed renewable and storage schemes, where schemes reach an appropriate level of maturity)
Establish understanding of industrial and domestic current/future electricity demands
EMCCA-wide exploration of industrial processes and future electricity demand needs to support coordinated outlook
Support ongoing collaboration between DNOs, local authorities and emerging community or third-party energy stakeholders to explore opportunities for network flexibility, electricity storage and local energy solutions, where evidence of need and delivery capability emerges.
Quick Wins
Enabling Actions
Scale-Up
Strategic Decision Point


2026
2030
2035
2040
2045
2050
Industrial Decarbonisation
Industry electrification - host 'supplier' showcase
Encourage voluntary ESOS requirements participation
Electrification of Low-Temp Process Loads
Support and promote East Midlands Hydrogen
Transition High-Temp Loads to Hydrogen
Engage major industrial emitters on barriers and challenges
Develop collective picture on industrial, commercial and domestic electrification needs to feed a holistic picture into future plans
Identify opportunities for commercial-domestic partnerships (e.g. use of excess heat in domestic heat networks)
LAEP wide actions
Regional online LAEP 'hub' – one-stop-shop for resources, advice, funding opportunities etc
Support community energy groups as a source of expertise and development of pipeline projects to accelerate early years
Create skills forum between education & local business
Local training to employment pipeline
Quick Wins
Enabling Actions
Scale-Up
Strategic Decision Point

14 Conclusions and Next Steps

The Gedling, Broxtowe and Rushcliffe Local Area Energy Plan provides a robust, data-driven, and spatially informed framework for delivering an equitable and economically efficient transition to net zero. It aligns Gedling, Broxtowe and Rushcliffe's local ambitions with regional and national policy objectives while tailoring interventions to the region's unique socioeconomic, infrastructural, and industrial characteristics.

The analysis presented throughout this plan confirms that Gedling, Broxtowe and Rushcliffe can significantly decarbonise its energy system by accelerating progress on energy efficiency, heat decarbonisation, and transport electrification while expanding local generation and enhancing system flexibility. The modelling outcomes demonstrate that these interventions, when coordinated effectively, deliver measurable benefits in emissions reduction, cost efficiency, and community well-being.

14.1 Key Conclusions

Gedling, Broxtowe and Rushcliffe's Emissions Profile Reflects Both Challenge and Opportunity:

- The region's emissions are concentrated in a small number of high-impact sectors, transport, domestic heating, and industrial energy use, which collectively account for nearly 77% of total emissions. These same sectors offer the greatest potential for rapid and sustained decarbonisation when interventions are properly sequenced and targeted.

A Fabric-First Approach Is Foundational:

- The modelling clearly indicates that demand reduction through insulation, glazing upgrades, and efficient heating systems provides the most immediate and cost-effective emissions savings.
- These measures also help to alleviate fuel poverty, improve comfort, and reduce peak energy demand, providing a foundation for further electrification and flexibility measures.

Local Generation and Storage Will Underpin System Flexibility:

- Solar PV, battery storage, and demand-side response solutions will be essential to mitigate grid constraints, particularly under higher electrification scenarios.
- Local renewable generation also enhances energy resilience and can provide community-level co-benefits

Transport Decarbonisation Requires Integrated Infrastructure Planning:

- The transition to electric mobility will place significant pressure on Gedling, Broxtowe and Rushcliffe's electricity network.
- Coordinated planning between the local authority, the Distribution Network Operator, and private charging providers is critical to ensure grid readiness, equitable access, and optimisation of charging infrastructure locations.

14.2 Strategic Implications

Delivering the LAEP will require coordinated action, stable policy support, and institutional readiness. The plan identifies the need for a dedicated Gedling, Broxtowe and Rushcliffe Partnership, specifically designed to address the unique challenges of decarbonising these areas, acknowledging the additional complications which a high prevalence of heritage or listed buildings and rural locations presents.

This Steering Group could comprise of representatives from Gedling Borough Council, Broxtowe Borough Council, Rushcliffe Borough Council, EMCCA, the local Distribution Network Operators, local

housing providers, industry specialists and community energy organisations. This governance structure would ensure that delivery of projects within the broader LAEP programme is sequenced, resourced, and monitored effectively across multiple actors, whilst drawing on the required expertise.

Funding and finance remain critical enablers. Leveraging national mechanisms such as the Warm Homes Plan, and Great British Energy programmes will be essential. However, innovative local financing models, including community energy investment, public–private partnerships, and aggregated purchase schemes, will also be needed to bridge funding gaps.

Integration with spatial planning and infrastructure investment is also key. Embedding LAEP outputs into the councils' Local Plans and infrastructure pipeline will help ensure that energy considerations shape new housing developments, regeneration projects, and industrial growth corridors. Similarly, early engagement with the local DNOs will be necessary to align reinforcement schedules with the forecast growth of low-carbon technologies, ensuring that energy and electrification of industrial demands is considered.

Gedling, Broxtowe and Rushcliffe's transition to net zero is both an environmental necessity and an opportunity to create a fairer, healthier, and more prosperous area. The LAEP demonstrates that with clear priorities, place-based planning, and coordinated governance, it is possible to achieve deep decarbonisation while delivering tangible local benefits.

The next decade will be decisive. By acting early on energy efficiency, low-carbon heat, and electrified transport, Gedling, Broxtowe and Rushcliffe can capture the economic and social advantages of the transition ahead of national timelines. Regular monitoring, transparent reporting, and adaptive management will ensure that progress remains on track and that interventions continue to deliver value for money.

14.3 Next Steps

To ensure the timely and effective delivery of the LAEP, the following immediate and critical steps are recommended:

- **Establish a Gedling, Broxtowe and Rushcliffe LAEP Delivery Partnership**: Create a cross-sector partnership chaired by Gedling, Broxtowe and Rushcliffe Council and supported by EMCCA, the Distribution Network Operator, local businesses, housing associations, and community representatives. This body should oversee programme coordination, track progress, and identify funding opportunities.
- **Launch Public Uptake and Engagement Programme:** Implement the recommended community engagement and communication strategy with urgency. This programme is vital to build public confidence, share good news stories, and drive the necessary adoption of low-carbon technologies like heat pumps. Priority should be given to demonstration and pilot projects that showcase best practice and real-world results.
- **Develop a Delivery Roadmap and Investment Plan**: Prioritise the short-, medium-, and long-term interventions identified in Chapter 13. This should include:
    - Quick wins: social housing retrofit, and solar deployment on public assets.
    - Enabler projects: grid reinforcement, and skills training programmes.
- **Secure Early-Stage Funding and Demonstrator Projects**: Identify and secure initial funding mechanisms (local, regional, and national) to kick-start demonstrator projects that can showcase tangible early benefits and build public support.
- **Hydrogen**: Initiate detailed engagement with key regional hydrogen stakeholders, such as East Midland Hydrogen, to better advise on Gedling, Broxtowe and Rushcliffe's specific industrial demand and the infrastructure development timeline. This will allow for informed decision-making regarding long-term solutions for high-temperature, hard-to-treat loads.
- **Monitor, Review, and Update**: Establish a monitoring framework with key performance indicators (KPIs) aligned to emissions reduction, energy demand, and social outcomes. The

LAEP should be reviewed on a five-year cycle to reflect policy developments, technological advances, and local progress.

Annexes

A. Glossary of Terms

Table A.1: Glossary of terms

After Diversity Maximum Demand (ADMD)	The estimated peak electrical demand per connection after accounting for diversity (i.e. the fact that not all devices run simultaneously); used by UK distribution network operators to size local network capacity and plan reinforcement for electrification from the installation of new technologies such as EVs and heat pumps
Air Source Heat Pump (ASHP)	An electrically driven heat pump that extracts heat from outside air to provide space heating and hot water; central to UK heat-electrification strategies but requires good insulation and grid planning.
Capital Expenditure (Capex)	One-off investment costs (e.g., buying heat pumps, building solar farms, grid upgrades) that are capitalised and influence project financing and payback.
Coefficient of Performance (COP)	Ratio of useful heat output to electrical input for a heat pump, equivalent to its efficiency when comparing to a typical boiler heating system. A key metric for system efficiency and running-cost/carbon calculations.
Combined Heat and Power (CHP)	Cogeneration that produces electricity and captures usable heat from the same fuel source, typically natural gas in UK installations.
Department for Energy Security and Net Zero (DESNZ)	UK government department responsible for energy security, energy policy and delivering the net-zero transition (policy, regulation, grants, standards).
Distributed Future Energy Scenarios (DFES)	Granular, licence-area forecasts produced by UK distribution system operators (DSOs) that model local uptake of EVs, heat pumps, storage and distributed generation to 2050 for network planning.
Ground Source Heat Pump (GSHP)	Heat pump that extracts heat from the ground via buried loops; typically higher and more stable COP than ASHPs but requires land/groundworks and different planning considerations in the UK.
Gross Value Added (GVA)	Economic measure of the value generated by goods and services (output minus intermediate consumption); used to assess economic impacts of decarbonisation policies and green investment.
Internal Combustion Engine (ICE)	Engine where fuel combustion occurs within the engine (petrol/diesel); ICE vehicles are a primary target for electrification to cut transport emissions in UK net-zero plans.

tCO_2e	One ton of equivalent carbon dioxide emissions. This unit aggregates greenhouse gasses using their Global Warming Potential, and is used to report on emissions at a project, local authority, or national scale. If prefixed with a k then it represents 1000 tonnes.
LULUCF	Land Use, Land-Use Change and Forestry sector covering emissions/removals from land management, afforestation, peatland restoration and land-use change — important for UK carbon accounting and sinks.
Minimum Energy Efficiency Standard (MEES)	UK legal minimum EPC rating for private rented properties (currently enforced thresholds with planned uplifts) to improve building efficiency and reduce emissions from the building stock.
Neso Future Energy Scenarios (FES)	Future Energy Scenarios (FES) published by the National Energy System Operator (formerly ESO/National Grid) — national, system-level pathways to 2050 used alongside DFES for planning and policy.
Operating Expenditure (Opex)	Recurring costs to run assets (energy, maintenance, staffing); critical for lifecycle carbon and cost modelling of low-carbon technologies.
W/m^2K	U-value unit (watts per square metre-kelvin) measuring thermal transmittance of building elements; a lower W/m^2K provides better insulation and lower heating demand. This is central to determining retrofit and heat-pump readiness of a building.

B. Data Types and Validation

B.1 Energy Savings Trust building attributes

Table B.1: List of attributes available from Energy Savings Trust for domestic and non-domestic buildings

Attribute	Domestic	Non-domestic
UPRN	✓	✓
Council Ward	✓	✓
LSOA	✓	×
Postcode	✓	✓
Address	✓	✓
Property Type	✓	×
Property Tenure	✓	×
Property Age band	✓	×
Number of Storeys	✓	×
Property Class	×	✓
Primary Use	×	✓
Mixed Use	×	✓
Building storey height	×	✓
Asset rating band	×	✓
Listed Building	✓	×
Wall Construction Type	✓	×
Wall Insulated	✓	×
In Conservation Area	✓	×
Flood Risk	✓	×
Floor Construction	✓	×
Floor Insulated	✓	×
Loft Insulation Prediction	✓	×
Glazing Type Prediction	✓	×
Heating System	✓	×
Fuel Type	✓	✓
EPC Rating	✓	×
SAP Score	✓	×
Roof Orientation	✓	×
Off gas grid	✓	×
Probability of fuel poverty	✓	×

ECO funding eligibility	✓	×
LAD funding eligibility	✓	×

C. EV Modelling Datasets

C.1 Modelling Assumptions

C.1.1 Datasets

Modelling has been undertaken using the following publicly available statistics and datasets:

- Midlands Connect EV research on EV capacity[89]
- CCC 7th Carbon Budget[90]
- UK Government Electric Vehicle Public Charging Infrastructure Statistics (2025)[91]
- ONS Middle layer Super Output Area population estimates (supporting information)[92]
- NESO Electric Vehicles Estimates[93]

C.1.2 Socioeconomic Parameters

- To perform modelling, socioeconomic parameters have been retrieved from available statistics and datasets:
- Population of Gedling = 117,730 (ONS, 2021)
- Population of Broxtowe = 112,113 (ONS, 2021)
- Population of Rushcliffe = 121,582 (ONS, 2021)
- Average number of cars per household in the East Midlands (2023) = 1.26
- Average number of people in a East Midlands household, (2023) = 2.36
- Number of EVs in the UK by 2050 = 37,400,000
- Number of public chargers across GBR (2025) = 251

C.1.3 Assumptions and Exclusions

- Not all ICE vehicles are decommissioned within the 2040 and 2050 scenarios.
- The CCC EV uptake projection is assumed proportionate across the UK.
- The model only includes the uptake of Battery Electric Vehicles (BEVs) and therefore does not account for Plug-in Hybrids (PHEVs), Hybrid Electric Vehicles (HEVs), Fuel Cell Electric Vehicles (FCEVs), Range-Extended EVs (REEVs), biofuel/biodiesel or other transitional technologies, which are assumed negligible by 2050.
- The model only considers private transport and therefore does not account for public transport, freight transport, or heavy-duty vehicles.
- Motorcycles, mopeds, and other forms of micro-mobility are excluded.
- Behavioural changes such as modal shift, car-sharing, or reductions in private car ownership are assumed to match the relative increase in population resulting in an equal volume of private cars in 2050 compared to today.

[89] Derby and Derbyshire on track for EV boom - Derby City Council
[90] https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf
[91] Electric vehicle public charging infrastructure statistics: January 2025 - GOV.UK
[92] Middle layer Super Output Area population estimates (supporting information) - Office for National Statistics
[93] Electric vehicles | National Energy System Operator

D. IES Baseline Validation by MSOA

Figure D.1: Results Validation - Gedling

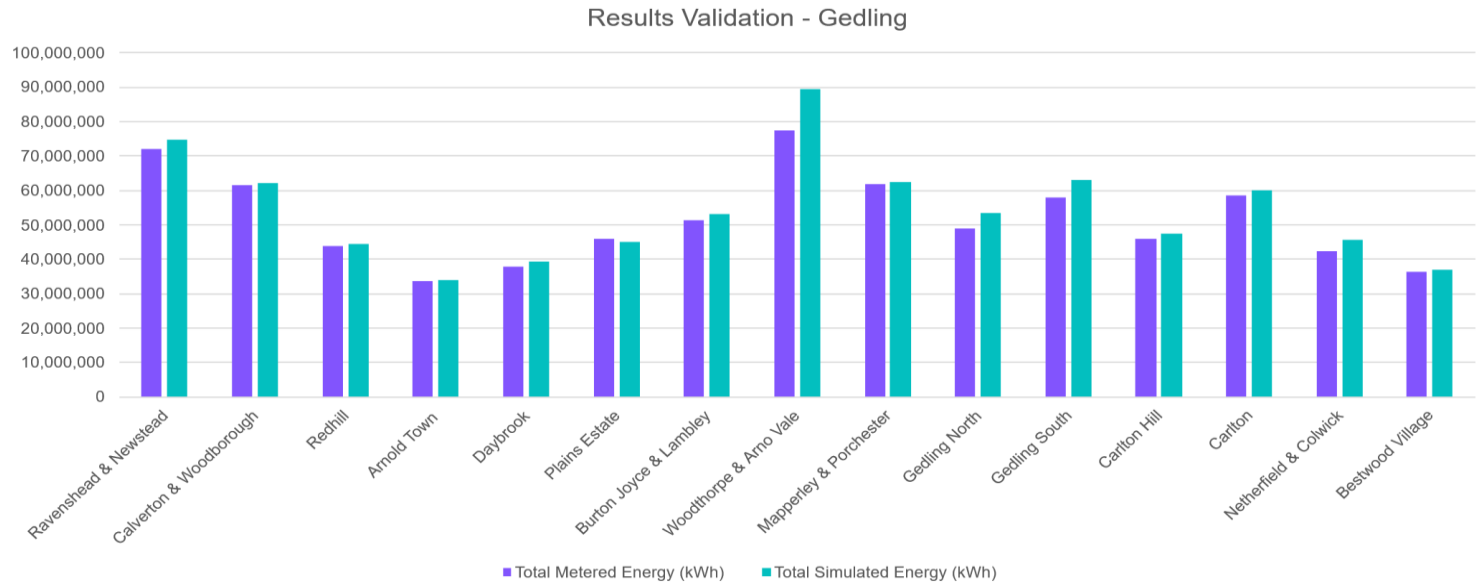


Figure D.2: Results Validation - Broxtowe

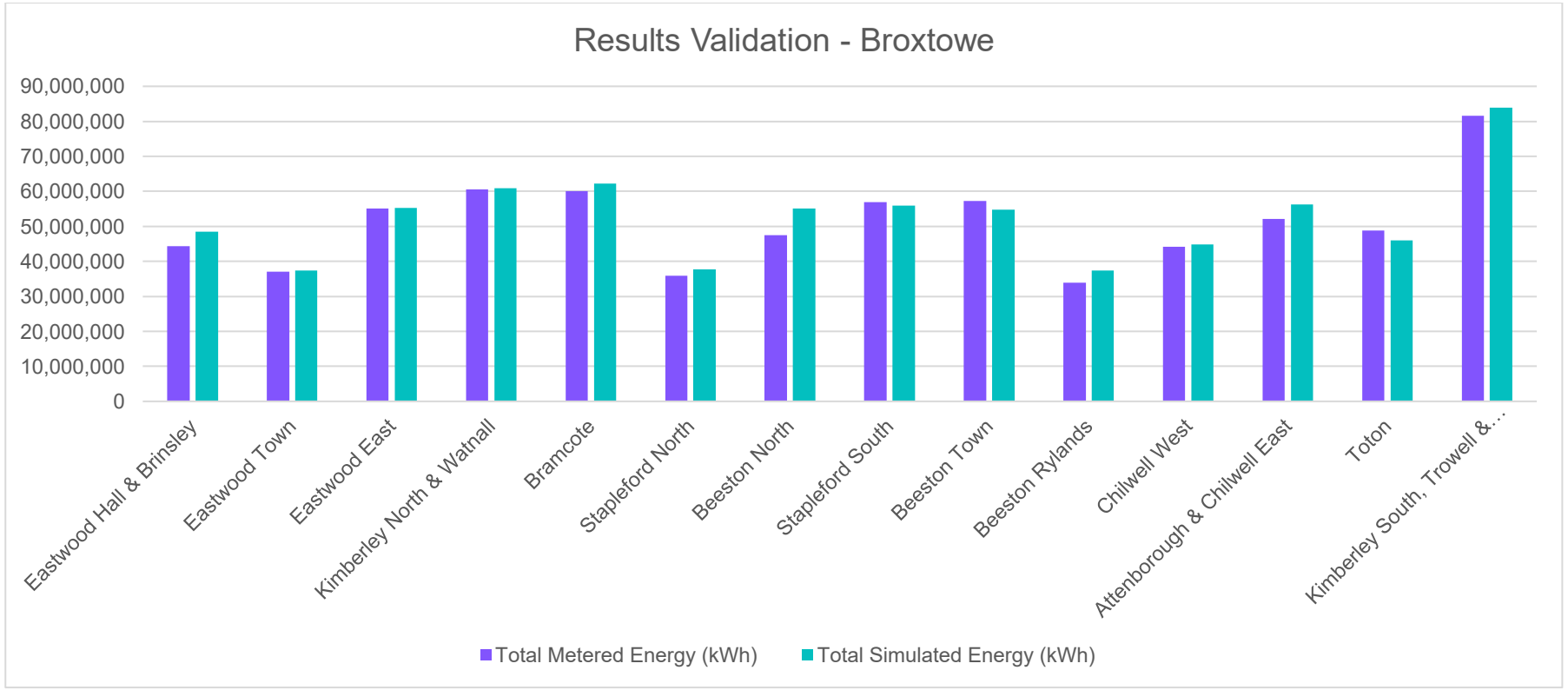
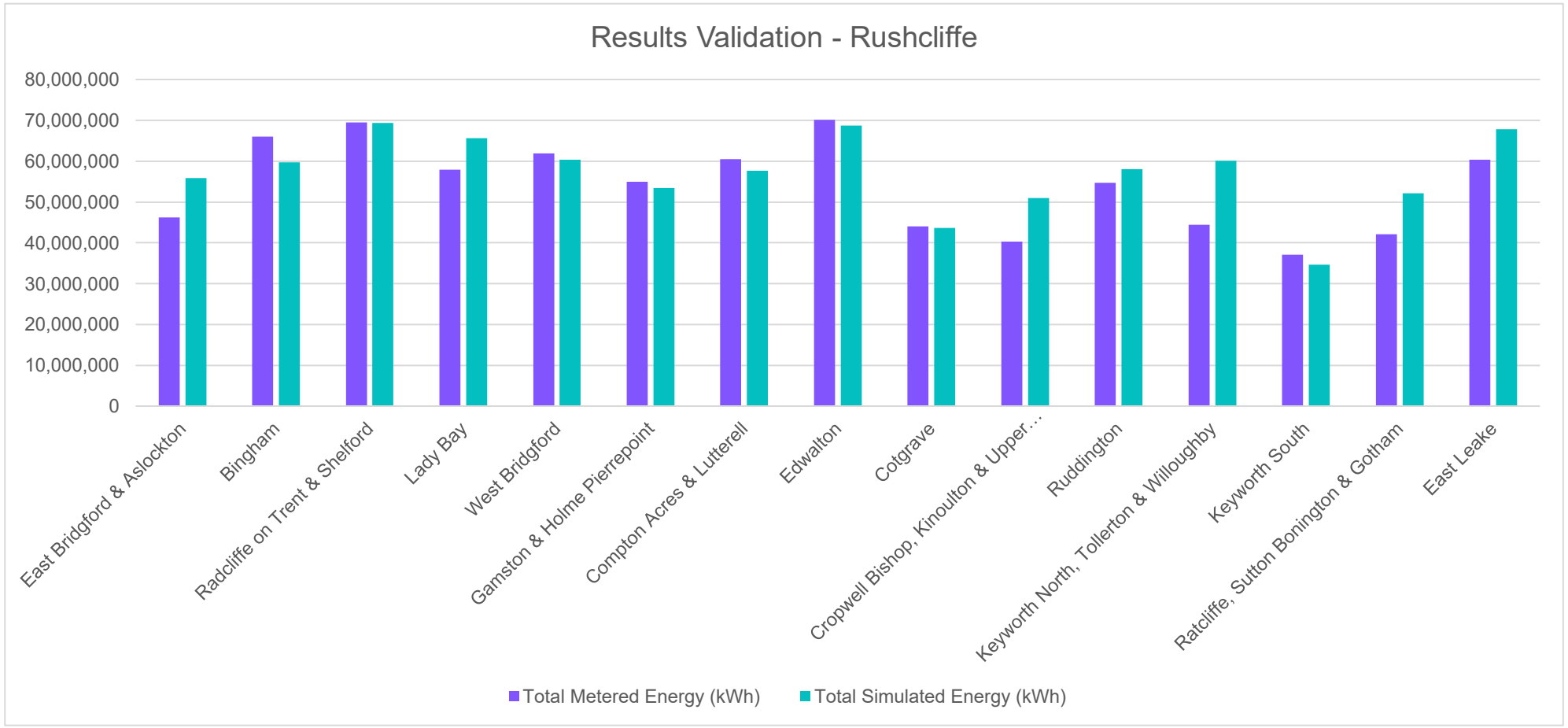


Figure D.3: Results Validation - Rushcliffe



E. Non-domestic top gas users

Table E.1: Non-domestic top gas users

Local Authority	Site Type/Organisation	Thermal Load (High Temp >80C)	Site Electricity Consumption for Building Use (MWh)	Site Gas Consumption for Building Use (MWh)	Site Gas Consumption for Process Use (MWh)	Site Total Gas Consumption (MWh)	Site Total Carbon Emissions (tonnes)
Broxtowe	Pharmaceutical Industrial Site		1,314	3,525	271,129	274,654	55,203
Broxtowe	Industrial Estate - Various		41	141	50,206	50,347	10,078
Broxtowe	Food Manufacturer	High	1,534	4,246	37,942	42,188	8,755
Broxtowe	Food Manufacturer	High	641	472	18,409	18,882	3,909
Broxtowe	Industrial Estate - Various		1,868	651	12,753	13,404	3,068
Broxtowe	Packaging site		494	1,397	8,220	9,617	2,026
Broxtowe	Mixed Retail Park		2,261	996	2,528	3,524	1,173
Broxtowe	Industrial Estate - Various		111	164	3,281	3,446	712
Broxtowe	Industrial Estate - Various		3,344	-	2,977	2,977	1,288
Broxtowe	Industrial Estate - Various		67	49	2,762	2,811	576
Gedling	Bio Energy Facility					130,524	26,105
Gedling	Construction Manufacturing Industrial Site	High	973	3904	83,034	86,939	17,589
Gedling	Construction Manufacturing Industrial Site		1,681	84	56,019	56,104	11,569
Gedling	Manufacturing Site		1170	-	10,326	10,326	2,307

Rushcliffe	Cement and lime Manufacturing Industrial Site	High	786	428	436,884	437,312	87,625
Rushcliffe	Educational Campus		5989	6564	22,116	28,680	6,976
Rushcliffe	Cement & lime Manufacturing Industrial Site	High	187	101	8,137	8,238	1,686
Rushcliffe	Institutional Public Secotr Building		105	336	7,329	7,664	1,555
Rushcliffe	Health - Public Sector Service Provider		3,991	-	6,008	6,008	2,028
Rushcliffe	Concrete Manufacturing Industrial Site		572	209	4,170	4,379	1,011
Rushcliffe	Educational facility - Public Sector		550	638	2,575	3,213	756
Rushcliffe	Commercial - Mixed Retail		1213	1367	1,607	2,973	846

F. Carbon emissions and energy use by local authority

This appendix provides a breakdown of historical carbon emissions and energy use by local authority – initially conveyed at the aggregated level in Figure F.1, Figure F.2 and Figure F.3.

Figure F.1: Gedling Historical Emissions (ktCO2e)

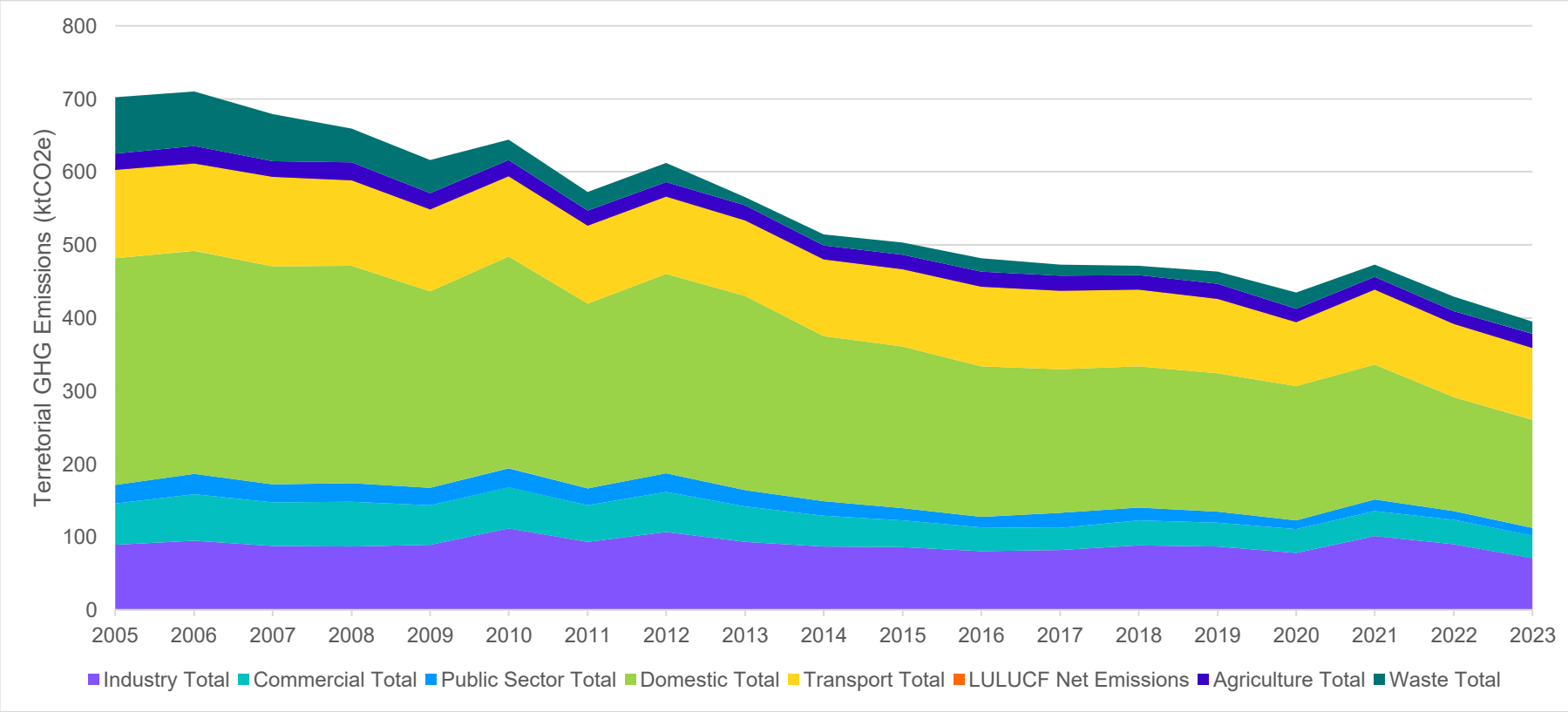


Figure F.2: Broxtowe Historical Emissions (ktCO2e)

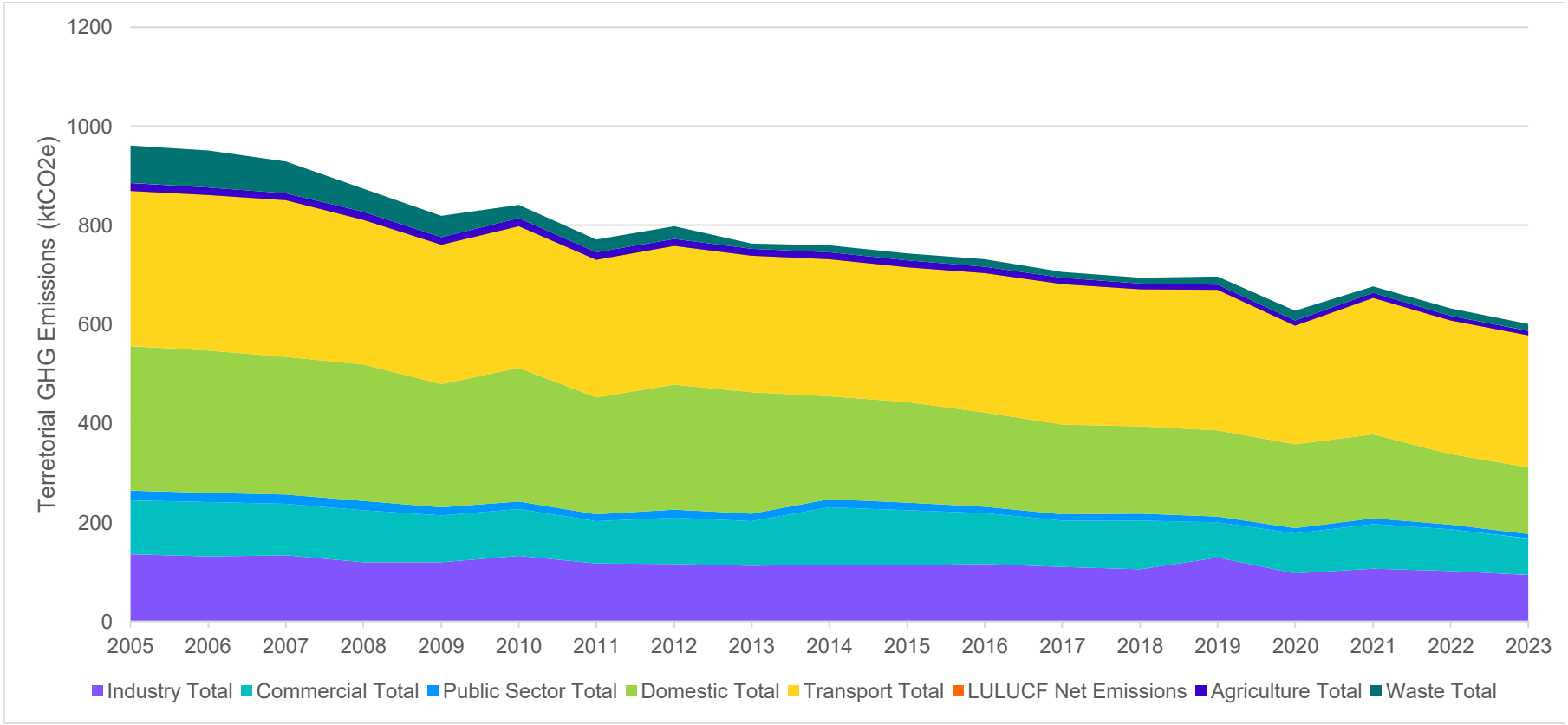


Figure F.3: Rushcliffe Historic Emissions (ktCO2e)

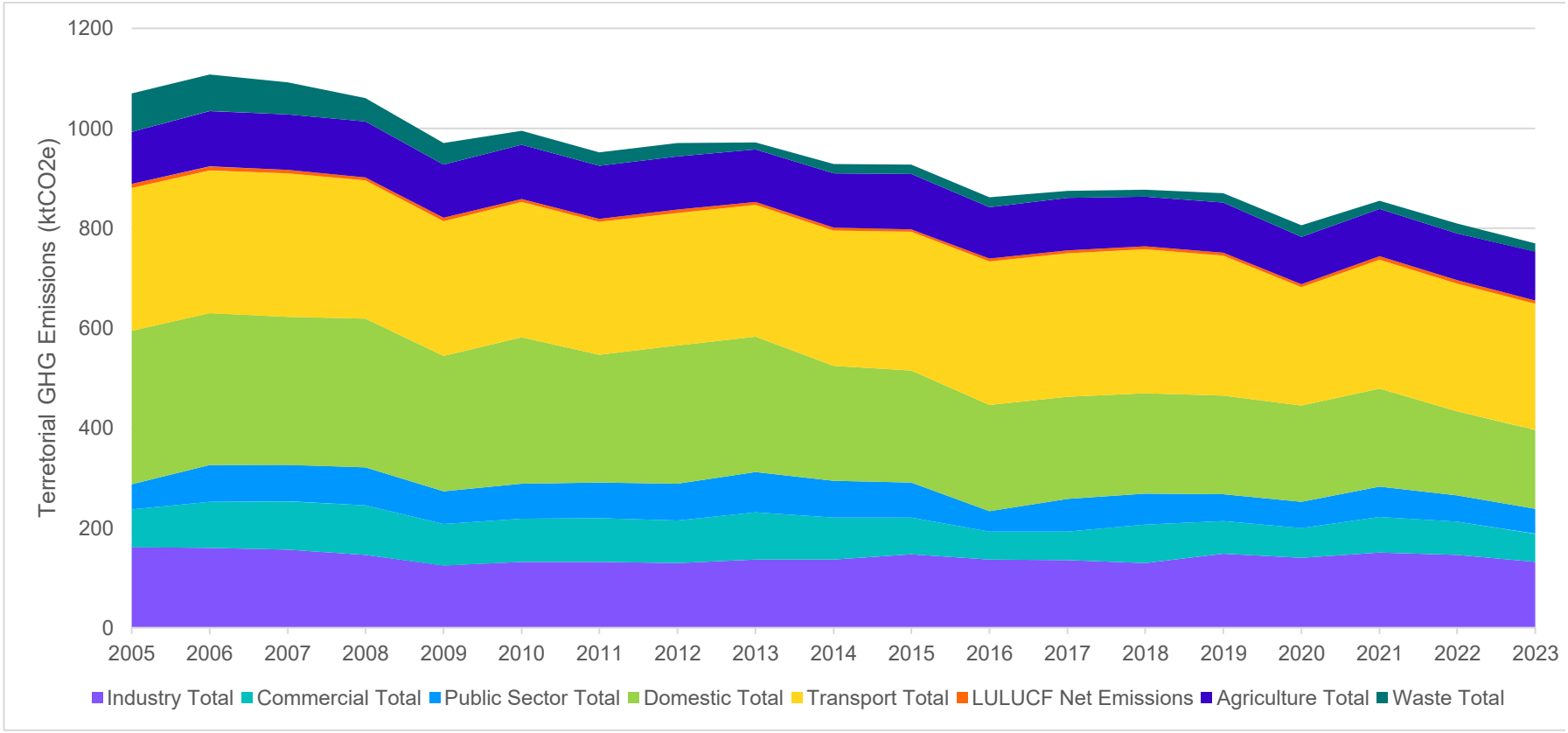


Figure F.4: Gedling, Broxtowe and Rushcliffe 2023 Carbon Emissions Breakdown by Sector and by Local Authority

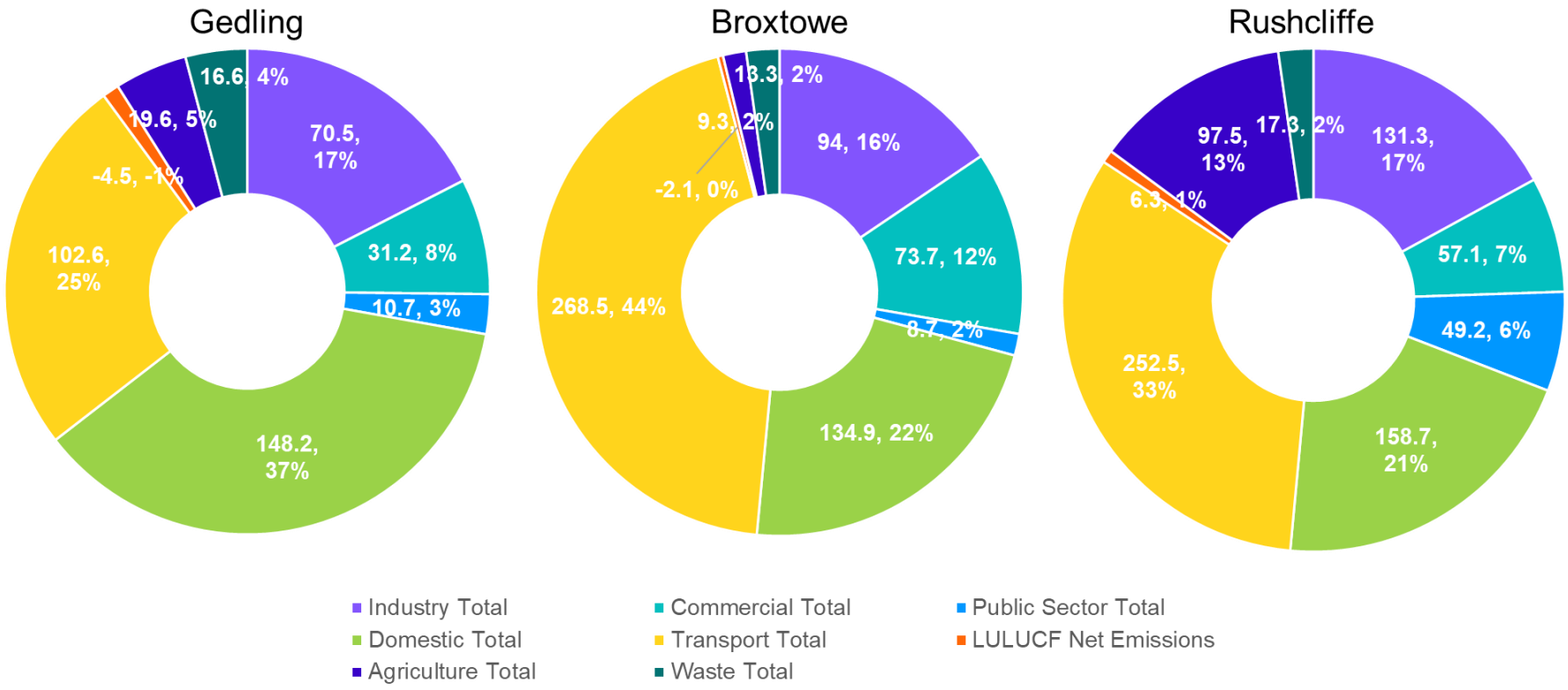
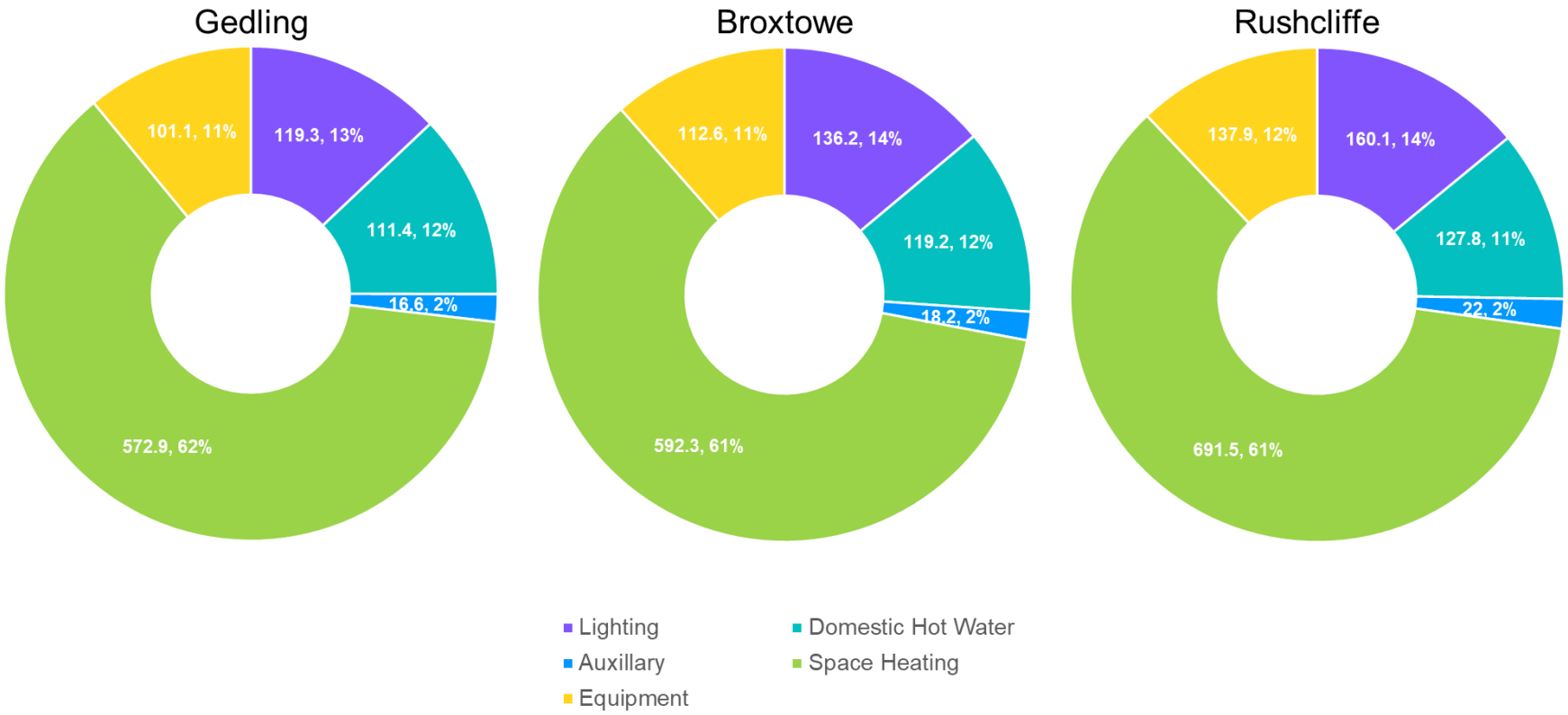
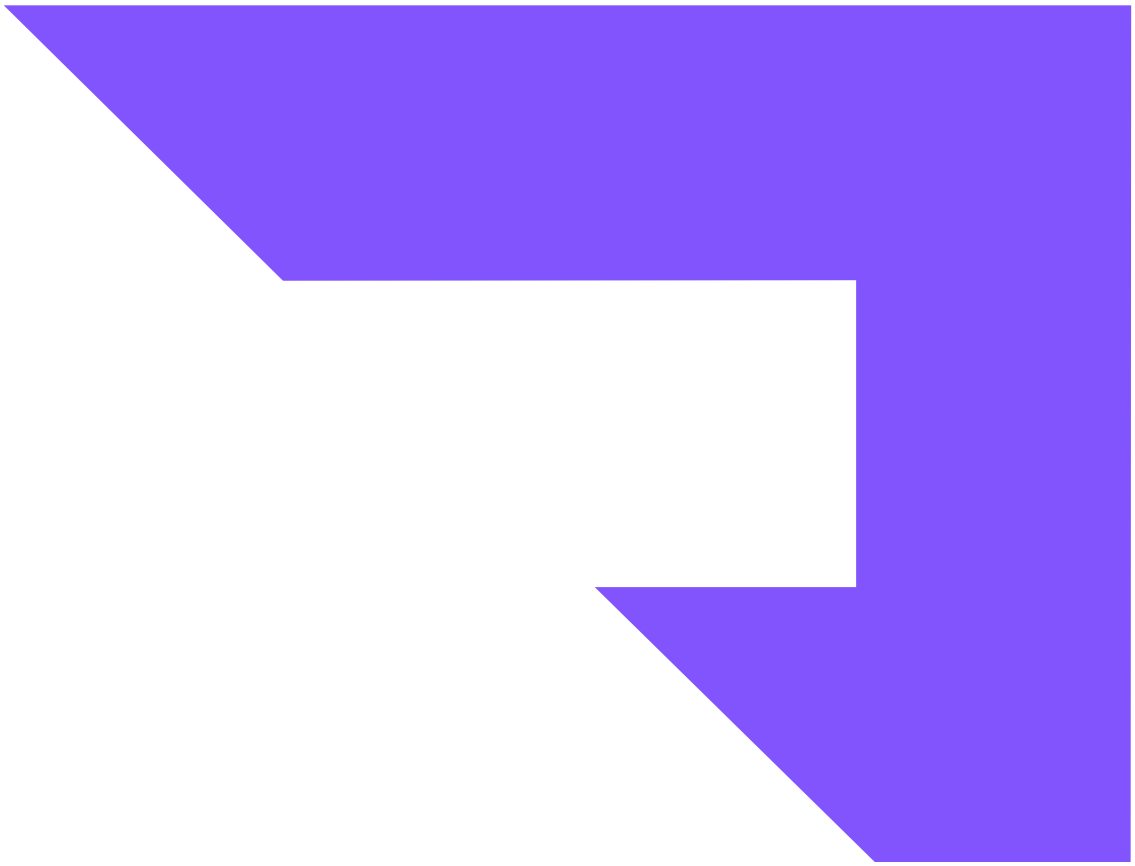


Figure F.5: Gedling, Broxtowe and Rushcliffe 2023 Building Energy Use Breakdown by Sector and by Local Authority





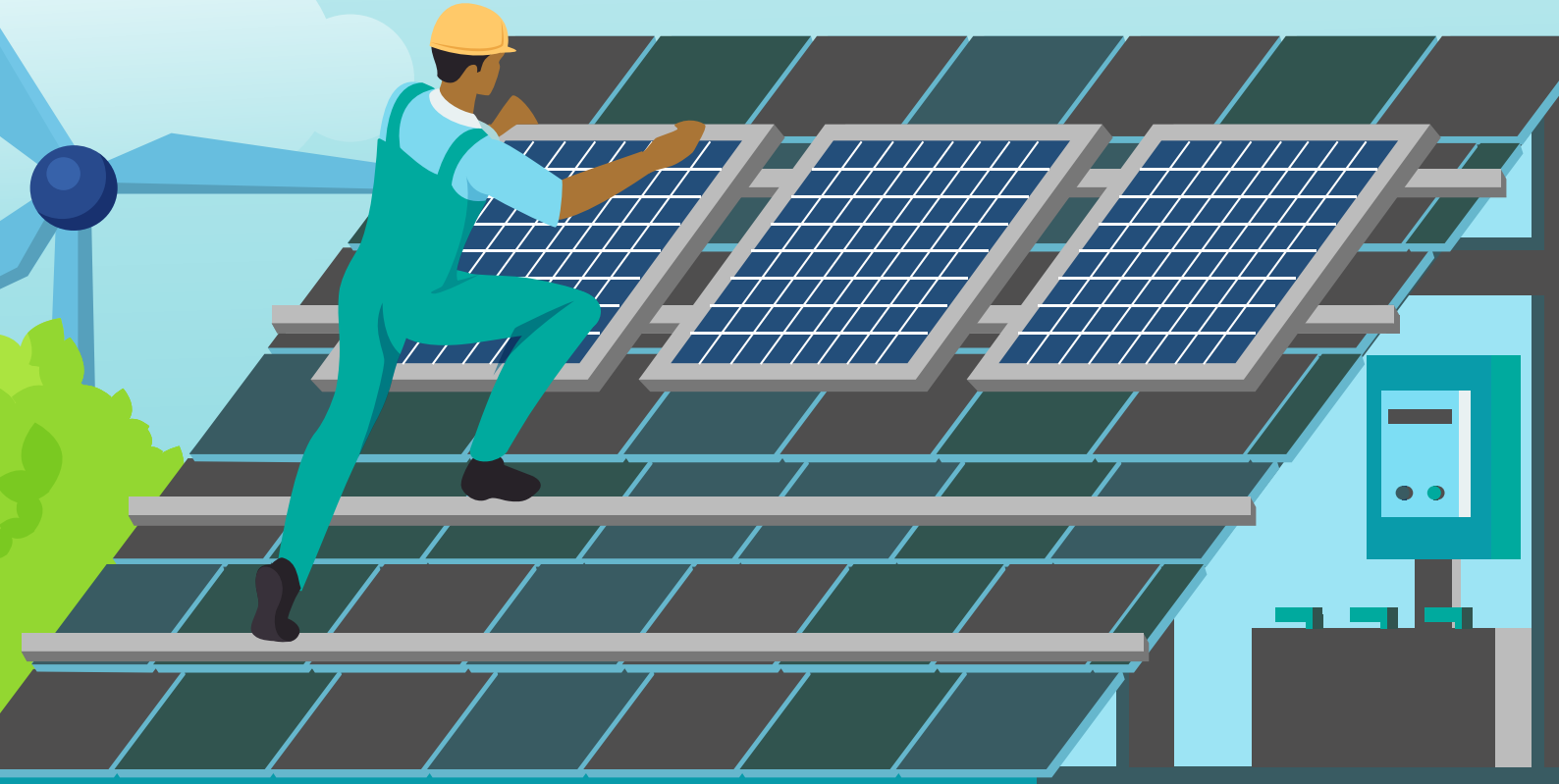
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CLAIRE WARD
MAYOR OF THE
EAST MIDLANDS

East Midlands
Combined County
Authority

East Midlands Combined Counties Retrofit Strategy

2025-2028



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1. Forewords

East Midlands Combined County Authority's (EMCCA) very first capital funding commitment to be delivered in full was £9.92m that was spent on domestic energy efficiency and low carbon generation retrofit activities within our region.

All of the 17 local authorities in the East Midlands were involved, and together we delivered a place-based project that was focused on making homes in the region more efficient, healthier, and cheaper to heat and power. All of the project's goals were overachieved, including 574 homes reaching an energy efficiency rating of at least EPC C and 837 measures being installed.

Working together with partners and local authorities, our mission is to make the East Midlands the best place to live, to work, and to learn.

Uncertainty about energy bills and cold homes have been unnecessary issues for residents in the East Midlands for too long. Improving people's homes to make them warmer in winter while reducing energy bills helps to deliver this mission.

Fuel poverty currently contributes to around 155 excess winter deaths across EMCCA annually. Retrofitting people's homes will help reduce this alongside reducing health inequalities and reducing absences from school and work.

It is estimated that every £1 invested in housing brings £2 of benefit through costs avoided to public services including care, health, and crime costs.[1]

Local authorities in the EMCCA region have a strong track record of retrofit delivery and EMCCA is ready to support the region to build on this and ensure the region continues to demonstrate leadership in delivering domestic energy efficiency projects and programmes.

While there is a good track record of delivering domestic retrofit programmes in our region, there are many barriers to support people to retrofit their homes. Our ambition is to enable the delivery of retrofit projects at scale, working with partners to ensure the delivery of at least 12,000 retrofitted homes over the next ten years.

The East Midlands Combined Counties Local Retrofit Strategy is a catalyst for action, not just on home energy efficiency, but for building a more resilient, prosperous, and inclusive region.

This Local Retrofit Strategy sets out a place-based roadmap that EMCCA will deliver alongside partners in the region. Our approach will work across six pillars: community, skills and training, homes, low carbon technology, financial resourcing, and governance.

But targets and strategies are not enough to deliver lasting change. We are beginning work with partners to accelerate progress on retrofitting homes in the East Midlands now. The East Midlands Combined County Authority is ready to lead a collaborative approach to energy efficiency projects that deliver real benefits for communities, the local economy, and the environment.

Michael Gallagher, Director of Climate Resilience and Green Growth

1 The Health Foundation, 2018

2. Executive Summary

The East Midlands Combined Counties (EMCC) Local Retrofit Strategy sets out a systems-led, place-based roadmap to accelerate home retrofit. This will support the reduction of fuel poverty, improve the quality of local housing, and increase environmental sustainability across the EMCC region. Developed through the Local Area Retrofit Accelerator (LARA) Pilot, this strategy unites a range of local stakeholders around a shared understanding of the need to reduce fuel poverty, delivering local economic and social benefits, and cutting emissions from heating and cooling homes. The EMCC is one of four 'localities' that participated in the LARA Pilot, convened by the MCS Foundation.

Tackling home retrofit at scale demands more than isolated projects, it requires systemic change. Our approach takes a whole-system view across six pillars: community, skills and training, homes, low carbon technology, financial resourcing and governance. It recognises that stakeholders need to collaborate and coordinate to create lasting, scalable impact. It is grounded in the unique characteristics and challenges of the East Midlands as a region, leveraging the expertise and energy of local partners while aligning with national net zero ambitions.

Between February and July 2025, over 58 organisations collaborated through a structured co-design process involving workshops, working groups, and stakeholder interviews. This included representation from local authorities, community groups, supply chain, social landlords, training providers, financial sector, and national partners.

Together, they developed a shared vision and mission, agreed principles, determined strengths, weaknesses, opportunities, and threats to accelerating retrofit in the region, and developed a suite of coordinated goals and actions.

Early delivery of priority actions will be an important first step to kick start the delivery of the strategy. This will include improving public advice services, developing the workforce, and coordinating the use of existing funding streams (for example, the government's Warm Homes scheme).

The EMCC Retrofit Strategy is a catalyst for action, not just on home energy efficiency, but for building a more resilient, prosperous, and inclusive region. With coordinated leadership, collaborative delivery, and ongoing support from partners, our region can become a model for retrofit at scale, delivering real-world benefits for households, the local economy, and the environment.

Our collective vision:

"A just future in which we're all living in healthy, energy-efficient homes within sustainable communities."

Our mission:

"We will improve our homes faster, prioritising confidence, quality, affordability and collaboration, and grow skills and jobs in our region."

The approach is underpinned by six shared principles:

- Trustworthy
- People-centred
- Accessible
- Purposeful
- Sustainable
- Collaborative

3. The Strategy House

The 'Strategy House' visually captures the core outputs of the co-design process. It also reflects the systems approach needed to accelerate retrofit, as the house is only as strong as the sum of its parts.

- **The foundations** – our mission and principles provide stability and direction to anchor and guide our collective action.
- **The pillars** represent the goals and sub-goals.
- **The roof** contains the vision and outcomes, which provides a clear sense of purpose, uniting and covering all our efforts beneath it.

Vision

"A just future in which we're all living in healthy, energy-efficient homes within sustainable communities."

Outcomes

Overall Retrofit Progress | Collective commitment | Health and wellbeing | Equitable access | Environmental Sustainability | Viable local retrofit sector | Capability

Goal 1: Increase awareness and confidence in all aspects of retrofit for all households and the retrofit sector.

Sub-goal 1.1: Develop a coordinated and trusted communication, information, and advice service

Sub-goal 1.2: Support and invest in community and peer to peer approaches

Sub-goal 1.3: Enable quality assurance for all retrofit work

Goal 2: Deliver a cross-sector, long-term regional (EMCC) collaborative partnership maintaining momentum for retrofit

Sub-goal 2.1: Get active participation in structures and processes for collaboration

Sub-goal 2.2: Share retrofit knowledge and data

Sub-goal 2.3: Coordinate resources and align bids and funding options

Goal 3: Accelerate development of scalable solutions and sustainable, long-term financial resources for retrofit delivery for all

Sub-goal 3.1: Develop tailored support pathways for all housing tenures to improve access to funding

Sub-goal 3.2: Support creation of consistent, long term funding streams for retrofit - an offering for all sectors of the market

Goal 4: Ensure we have local/ regional capacity and capabilities for high quality retrofit delivery at scale

Sub-goal 4.1: Grow and diversify the retrofit workforce

Sub-goal 4.2: Work towards a robust local/regional supply chain and a viable retrofit market

Goal 5: Ensure that retrofit enhances quality of life, and delivers healthier, future proofed homes and reduced fuel poverty

Sub-goal 5.1: Promote and evaluate the health impacts of retrofit

Sub-goal 5.2: Prioritise the alleviation of fuel poverty

Misson

"We will improve our homes faster, prioritising confidence, quality, affordability and collaboration, and grow skills and jobs in our region."

Principals

Trustworthy | People-centred | Accessible | Purposeful | Sustainable | Collaborative

4. Introduction

The EMCC Local Retrofit Strategy (the strategy) primarily sets out how the region can make progress in improving the efficiency of heating and cooling of domestic buildings and alleviating fuel poverty. But it is more than that. It's a plan to increase good health outcomes from living in decent homes, support growth within the sector, and to create skilled and well-paid jobs. It's about making decisions that balance economic, social, and environmental considerations. It has an eye on the future and ensures we are prepared for the climate to come. This aligns with the East Midlands Combined County Authority (EMCCA) Corporate Plan by supporting the following themes highlighted in the plan:

- Regional strategy, investment and devolution
- Business growth and innovation
- Skills and employment
- Net zero transition and climate resilience
- Housing and regeneration

This strategy was developed as part of the Local Area Retrofit Accelerator pilot (the pilot). This initiative aimed to take a systems approach to tackling retrofit. A systems approach thinks about problems and solutions by considering the entire system, rather than individual parts. It's a holistic and interdisciplinary method that emphasises how different elements interact.

The pilot takes a place-based approach using a collaborative process to address the needs of a community by working together to improve the quality of life. It involves understanding a place's social context and physical setting. In this context the place was Derbyshire and Nottinghamshire and stakeholders from across the retrofit system were invited to co-design the strategy.

The co-design delivery involved three key stages:

Shared Understanding:
Mapping the local retrofit system, stakeholders, policies, and data to establish a clear baseline

Vision and Planning:
Facilitating stakeholders to agree a shared vision, action plans, and draft the strategy which sets out to improve the local retrofit system

Review and Endorsement:
Senior stakeholders review and formally endorse the strategy, launching it publicly to mobilise collective action







5. Vision and Mission

Our vision

"A just future in which we're all living in healthy, energy-efficient homes within sustainable communities."

Our mission

"We will improve our homes faster, prioritising confidence, quality, affordability, and collaboration, and grow skills and jobs in our region."



6. Strengths, Weaknesses, Opportunities, Threats (SWOT)

This SWOT was developed over several phases. The project team conducted qualitative and quantitative research published in the Locality Assessment with data gathered through desk-based research and stakeholder interviews.

The Locality Assessment informed the workshops and set a baseline understanding of the EMCC region's local retrofit system. The Locality Assessment report details specific geographic and demographic information about the area and provides insight into activity taking place there. Each element of the SWOT has fed into the goals and actions developed by the project team to ensure there is a strategic fit.

Strengths

- Rich experience of local retrofit delivery
- Local training centres
- Local partnerships and advice centres
- Best practice examples to build
- Local Area Energy Planning under way
- Retrofit Employers Forum
- Green skills programme

Opportunities

- Coordinated action through East Midlands Combined County Authority (EMCCA)
- Coordination of future skills development
- Pilot of mine water heat scheme in ex-coalmine
- Energiesprong, FurbNow, and other models can be replicated
- Public health support in retrofit
- Midland Net Zero Hub signposting
- Digital space opportunity building on the Green Rewards app
- Archetype guides

Weaknesses

- No list of recommend suppliers
- Grants and support not available to all
- Grants don't take account of differential costs for rural areas
- Lack of coordination between housing associations
- The community sector varies across the region
- A lot of the contractors working locally are based outside the region
- Need for better ways to measure the benefits of retrofit

Threats

- High levels of deprivation
- Lack of incentive for SMEs to invest in training staff
- Lack of trust and disinformation
- Complex retrofit projects are not cost-effective for installers
- Short-term government grant schemes

7. Principles

These key principles for a better retrofit system were identified by the region

- TRUSTWORTHY – demonstrating competence and quality
- PEOPLE-CENTRED – focus on the customer and giving them agency
- ACCESSIBLE – providing clarity and making retrofit easy and inclusive
- PURPOSEFUL – pragmatic idealism, action-orientated, and brave
- SUSTAINABLE – a long-term, future-proofed approach
- COLLABORATIVE – alignment, with everyone included and involved

These shared principles will help inform and guide retrofit activity undertaken by organisations who endorse the strategy. The governance agreements between signatories to the strategy will formally ensure their importance. The principles have influenced the goals and actions and are critical in achieving the vision.



8. Outcomes

These outcomes of the strategy will be delivered by achievement of the goals. Progress towards delivering the outcomes will be monitored and the project team propose the following metrics:

Overall progress KPIs:

- Percentage increase in number of homes per year retrofitted well
- Average EPC increased rating across the EMCC region
- Improved indices of fuel poverty
- Increase of people employed in retrofit careers
- Increase of accredited installers (e.g. MCS)
- Increase of collaborations and partnership in the retrofit system
- Increase of community energy organisations
- Increase of MCS accredited low carbon technology installations per year
- Increased level of investment in retrofit

Collective commitment

- Growing commitment to working together as a region

Health and wellbeing

- Reduction in number of people suffering poor health due to damp and/or mould via GP referrals
- Improvements to health and wellbeing, quality of life

Equitable access

- Reduction in fuel poverty and increase in accessibility of funding/finance

Environmental sustainability

- Reduction in carbon emissions from domestic properties

Viable local retrofit sector

- Local retrofit supply chain works and delivers quality retrofit

Capability

- Strong local skills base

Some KPIs may rely on proxy measures where direct measurement is challenging – for example, assessing the impact of 'knowledge sharing'.







9. Goals and Actions

The following goals and sub-goals have been determined by the region.

Each goal has an example of linked actions, further actions, and additional information including alignment to SWOT analysis that can be found it the accompanying action plan.

Goal 1
Increase awareness and confidence in all aspects of retrofit for all households and the retrofit.

Goal 2
Deliver a cross-sector, long term regional (EMCC) collaborative partnership maintaining momentum for retrofit.

Goal 3
Accelerate development of scalable solutions and sustainable, long-term financial resources for retrofit delivery for all.

Goal 4
Ensure we have local/regional capacity and capabilities for high quality retrofit delivery at scale.

Goal 5
Ensure that retrofit enhances quality of life, delivers healthier, future-proofed homes, and reduces fuel poverty.



Goal 1

Increase awareness and confidence in all aspects of retrofit for all households and the retrofit.

This goal aims to increase retrofit activity and the number of installed measures locally, enabling residents to live in healthy, energy-efficient homes. To achieve this, the focus will be on offering trusted advice, nurturing peer-to-peer communications, and improving quality assurance by highlighting positive stories.

Sub-goal 1.1: Develop a coordinated and trusted communication, information, and advice service

- Develop a comprehensive retrofit map featuring regional actors and networks to support providers and provide effective signposting to the best advice.
- Develop a trusted brand for regional advice and guidance providers to improve trust for public and suppliers
- Create a Retrofit Support Service website for advice and to triage service via website, email, phone, and events.

Sub-goal 1.2: Support and invest in community and peer-to-peer approaches

- Create a community engagement retrofit role or add to existing role to empower community organisations to support retrofit.
- Develop a network of community champions and organisations and provide retrofit training.
- Create a network of 'open homes' to demonstrate different technologies and support community groups to run events.

Sub-goal 1.3: Enable quality assurance for all retrofit work

- Create retrofit supply chain role(s) or add to existing position(s)
- Develop an agreed approach for grant commissioners to ensure good governance and quality of retrofit install
- Review ECO LA Flex practices and agree coordinated, minimum-service-level approach



Goal 2

Deliver a cross-sector, long term regional (EMCC) collaborative partnership maintaining momentum for retrofit.

This goal builds on the collaboration developed by key retrofit stakeholders across the region. Working together to deliver more for less with better outcomes. To achieve this there will be improved structures and processes for regional retrofit activity and greater collaboration across sectors, particularly around data sharing and funding opportunities.

Sub-goal 2.1: Get active participation in structures and processes for collaboration

- Create a role to coordinate stakeholder activity or allocate to existing position
- Facilitate a cross-sector action group to drive partnership activity between local authorities and social landlords – convened by EMCCA-based strategic lead
- Set up a cross-sector action group for skill development for employers and training providers convened by EMCCA-based strategic lead

Sub-goal 2.2: Share retrofit knowledge and data

- Create retrofit data and research role or allocate to existing position
- Facilitate data sharing and collaboration between organisations involved in retrofit to build understanding and map regional capabilities
- Collate and publish timely retrofit information and data and balance demand

Sub-goal 2.3: Coordinate resources and align bids and funding options

- Improve collaboration for grant scheme delivery between local authorities and social landlords
- Realise opportunities for collaboration and local supplier procurement from Warm Homes funding



Goal 3

Accelerate development of scalable solutions and sustainable, long-term financial resources for retrofit delivery for all.

This goal highlights the need for economic stimulus to achieve a growth, including both private investment and institutional funding. A more technical and coordinated approach to regional retrofit will focus on the need for long-term financial products alongside developing specialist support services while ensuring the best use of grant schemes and the development of appropriate financial offers.

Sub-goal 3.1: Develop tailored support pathways for all housing tenures to improve access to funding

- Create a grant scheme support and coordination role or allocate to existing position
- Research retrofit facilitation provider/ specialist support service options
- Consult stakeholders to develop and implement a retrofit facilitation model

Sub-goal 3.2: Support creation of consistent, long term funding streams for retrofit – an offering for all sectors of the market

- Create a retrofit finance coordination role or allocate to existing position
- Assess and compare local authority funding options, grants, loan schemes, carbon offsetting
- Consult with stakeholders on findings and determine preferred finance option(s) to develop and test



Goal 4

Ensure we have local/regional capacity and capabilities for high quality retrofit delivery at scale.

This goal helps to balance the demand-orientated actions of goals 1 and 3 while developing capacity within the local supply chain to support an increase in demand and diversification within the sector. This will ensure carbon reductions are delivered and give consumers confidence in their needs and aspirations being fulfilled.

Sub-goal 4.1: Grow and diversify the retrofit workforce

- Create a retrofit installer forum to provide upskilling, recruitment, and retention support
- Create a retrofit trainer forum to develop and agree a plan for retrofit training in the region
- Secure funding to develop and deliver services to support new entrants and cross-training into retrofit careers

Sub-goal 4.2: Work towards a robust local/regional supply chain and a viable retrofit market

- Develop and deliver procurement strategy with focus on SMEs in local supply chain, to include advice on accessing finance
- Develop and deliver SME-friendly social impact standard for retrofit projects/ procurement
- Boost communications within the supply chain to promote opportunities, support with challenges, celebrate best practice, and foster peer support



Goal 5

Ensure that retrofit enhances quality of life, delivers healthier, future-proofed homes, and reduces fuel poverty.

This goal reflects the vision and aspiration to deliver a range of benefits for all. Through improved housing retrofit we aim to deliver better life outcomes, including improved health and a reduction in fuel poverty. This will be underpinned by further research, the delivery of new, coordinated services and processes, and a collaborative approach to accelerate grant funding.

Sub-goal 5.1: Promote and evaluate the health impacts of retrofit

- Set up a public health retrofit forum with social and integrated care representatives to improve collaboration and increase health outcomes through retrofit
- Evaluate the health benefits of different retrofit approaches to guide future health-based investment and co-develop guides for best practice
- Improved collaboration between health and housing sectors to develop pilot projects to improve health outcomes

Sub-goal 5.2: Prioritise the alleviation of fuel poverty

- Create a retrofit fuel poverty role or allocate to existing role position
- Create a fuel poverty forum and conduct stakeholder assessment of those involved in fuel poverty work within region
- Deliver place-based, fuel poverty alleviation retrofit project(s), assess outcomes to ensure fuel poverty alleviation is prioritised, and develop improvement plans where needed



10. Endorsement

The strategy has been endorsed by the following organisations:

Organisation Logos to go here once endorsed

11. Definitions

The strategy has the following defined terms:

- **ACTIONS:** Things done by people and organisations in the East Midlands Combined Counties in support of goals, by individuals or groups.
- **GOALS:** Something the East Midlands Combined Counties hopes to achieve which is formed of multiple actions and achieved by multiple parties.
- **MISSION:** How the work needed to achieve the vision will be taken forward.
- **OUTCOMES:** The result of something, or the consequence of it, is the outcome.
- **STRATEGY:** A plan for the East Midlands Combined Counties made up of multiple goals and associated actions that work towards a wider mission and vision.
- **SYSTEMS-BASED APPROACH:** A systems approach thinks about problems and solutions by considering the entire system, rather than individual parts. It's a holistic and interdisciplinary method that emphasises how different elements interact.
- **VISION:** One sentence that describes the future-facing, longer-term ambition of the strategy and offers inspiration and motivation.



12. Information sources

Links to relevant organisational strategies and supporting reports to go here

What SAVINGS could you expect for a typical retrofit?

(Loft insulation, external wall insulation, draught proofing, airtightness improvements, ASHP installation, small solar PV array)

Note: All costs and savings are based on typical 2025 prices and will vary between homes.



THE COST

- Fabric upgrades: £25,500
- ASHP: £12,300
- Solar PV: £8,000

Total cost: ~£45,800 (exc. VAT)

THE BENEFIT

- Heating demand reduction: up to 58%
- Total annual energy use reduction (with ASHP): up to 32%
- Annual bill savings: around £1,035/year
- Carbon reductions over 20 years: 44 tCO_2e saved

Total cost: ~£45,800 (exc. VAT)

Typical retrofit payback: ~44 years
(but improves comfort immediately)

Most cost effective carbon and bill savings come from:
External wall insulation + ASHP, after basic fabric improvements.

What's the Best Sequence for a Semi Detached Home?

- Loft insulation + draught proofing
- External wall insulation (EWI)
- Airtightness improvements
- Install ASHP
- Optional: Solar PV

This order gives the greatest comfort, lowest bills, and strongest carbon savings.

Measure	Typical Cost	Annual Savings	Carbon Impact
Loft insulation (to 270+ mm)	£	★★	★
External Wall Insulation (EWI)	£££	★★★	★★★
Internal Wall Insulation (IWI)	£££	★★	★★
Air Source Heat Pump (ASHIP)	££	★★	★★★
Solar PV (5 panels)	££	★★	★

£ low ££ medium £££ high
★ low ★★ medium ★★★ high

FURTHER INFORMATION

Every home is different, the figures provided are typical, not exact.

Prices reflect 2025 cost assumptions and may change.

Savings depend on energy prices, installation quality, and occupant behaviour.

Whole house assessment under PAS 2035 is recommended before starting work.

Thinking about retrofitting your semi detached home?

There is support available to help you understand your options, check eligibility for grants, and find qualified installers.

Xxxxxxx contact details

Broxtowe Borough COUNCIL

Why. . .



Retrofit Your Semi-Detached Home?

SAVE up to £1,035 on annual energy bills

Retrofitting makes your home warmer, cheaper to run, and better for the planet.

A well insulated home needs far less heating, helping to cut rising bills and reduce carbon emissions. Retrofitting also improves comfort, reduces damp and mould risk, and supports the UK's journey to net zero.

Energy Use REDUCED by up to 32%

Heating demand REDUCED by up to 58%

BEFORE
Cold Rooms • High Bills • Drafts

AFTER
WARMER HOME • LOWER BILLS
BETTER COMFORT

June 2026

www.broxtowe.gov.uk



SEMI DETACHED HOMES:

KEY FACTS

Based on typical Broxtowe semi detached homes (built 1900–1960s).

- **Floor area:** 85–95m²
- **Walls:** Mostly solid brick with no insulation (47–60%)
- **Roof:** Often 100mm loft insulation (can be improved)
- **Floors:** Mostly uninsulated solid or suspended timber floors
- **Windows:** Majority already double glazed
- **Heating:** Over 88% use gas boilers

Measure Summaries

Solar PV Panels

Generate your own electricity from sunlight.

- Good for bill reduction.
- Less effective for carbon reduction over 20 years because of embodied carbon.
- Works well alongside an ASHP.

Loft Insulation

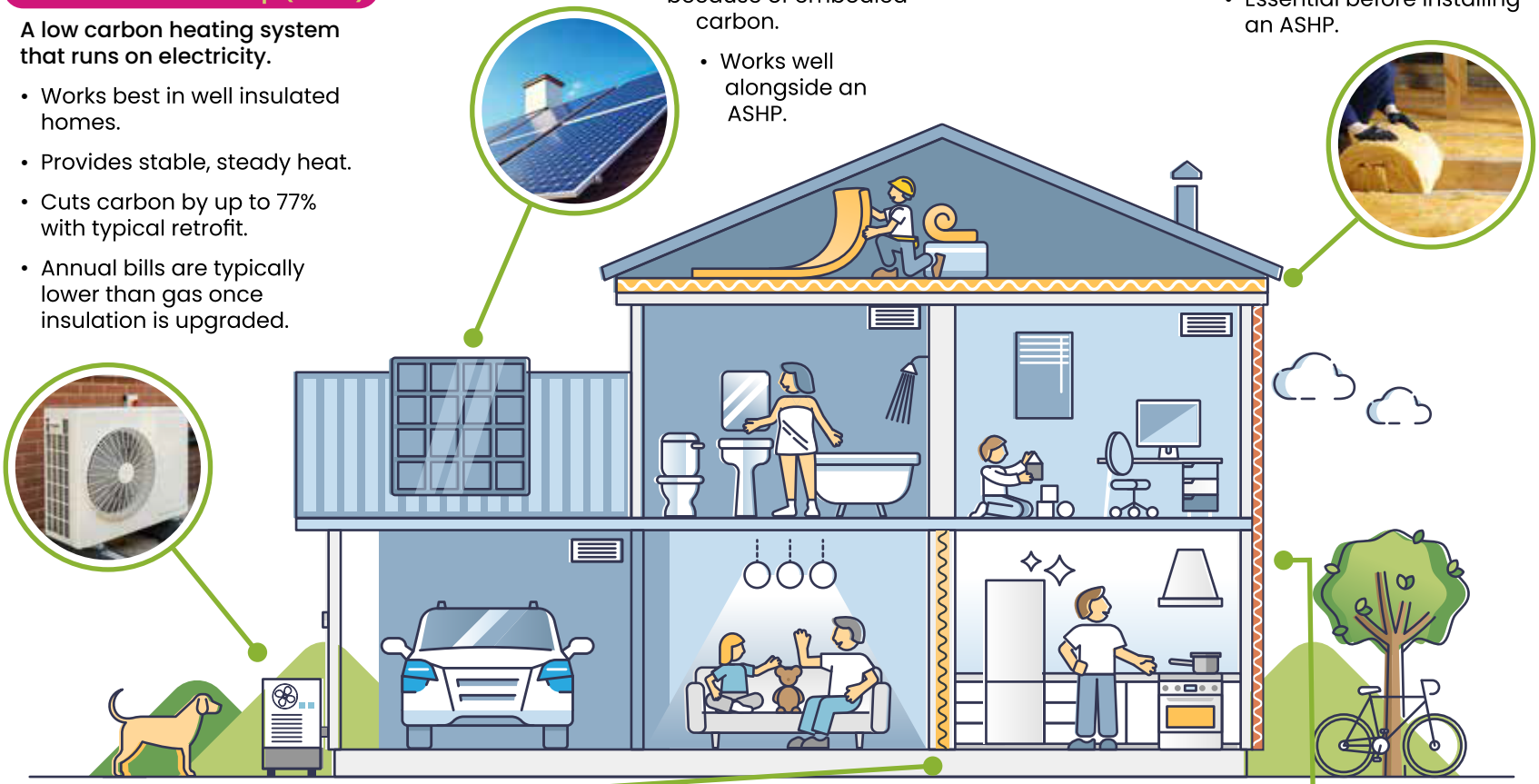
One of the most cost effective upgrades.

- Prevents up to 25% heat loss through the roof (where insulation is poor).
- Essential before installing an ASHP.

Air Source Heat Pump (ASHP)

A low carbon heating system that runs on electricity.

- Works best in well insulated homes.
- Provides stable, steady heat.
- Cuts carbon by up to 77% with typical retrofit.
- Annual bills are typically lower than gas once insulation is upgraded.



Internal Wall Insulation (IWI)

An alternative to EWI if external appearance must be preserved.

- More disruptive.
- Moisture management essential.

External Wall Insulation (EWI)

The single biggest energy saving measure for semi detached homes.

- Cuts heat loss dramatically.
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Loft Insulation

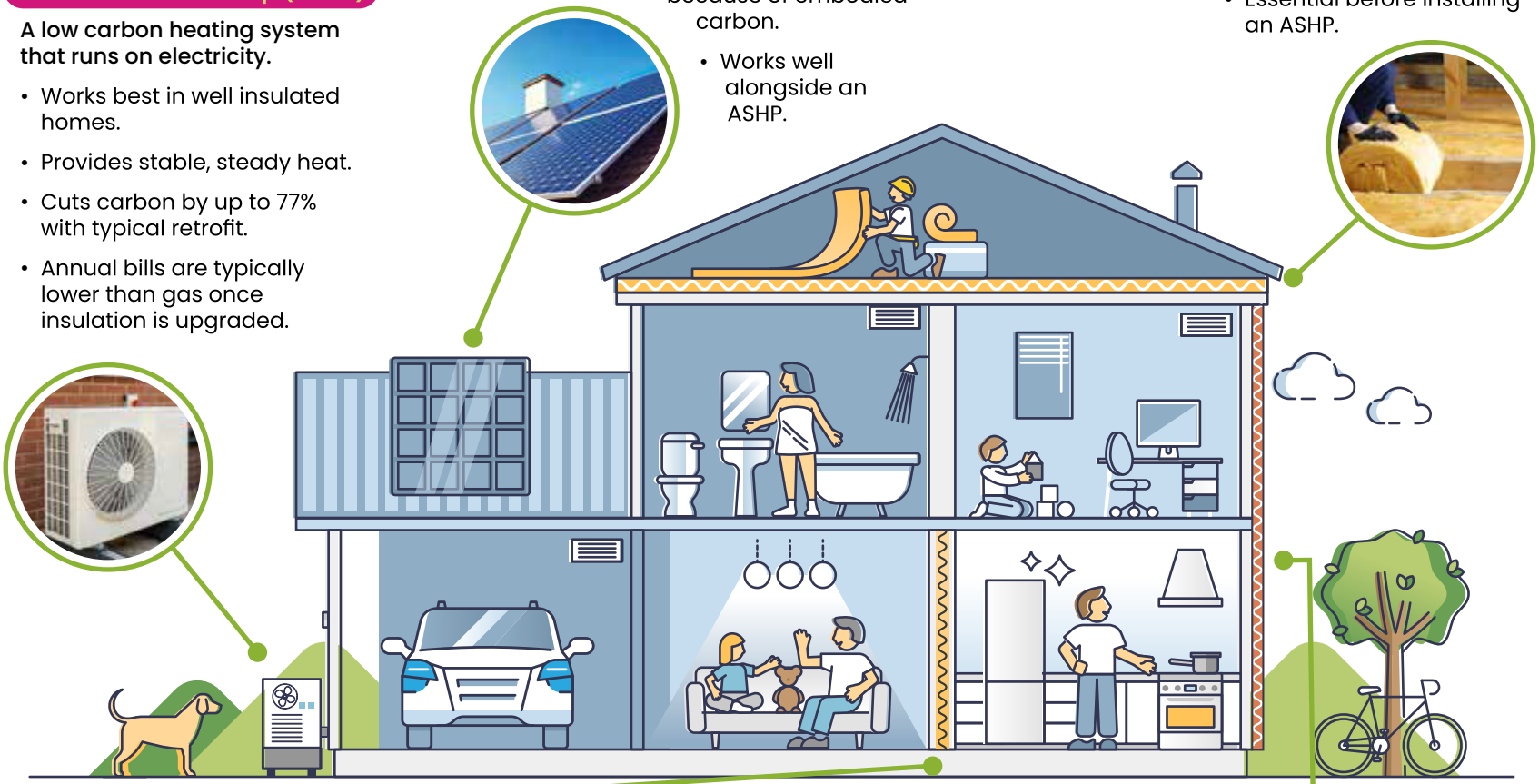
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Cabinet **21 July 2026**

Report of the Portfolio Holder for Housing

Additional Housing Complaints Officer

1. Purpose of Report

To seek approval for an additional Housing Complaints Officer in the Housing Services and Strategy team.

2. Recommendation

Cabinet is asked to RESOLVE that an additional Housing Complaints Officer (Grade 6) is added to the establishment.

3. Detail

In recent years the Housing Ombudsman (HO) and the Regulator of Social Housing (RSH) have been encouraging tenants and leaseholders to provide feedback and hold their landlords to account. The Council are in support of this approach. However, this has led to an increase in the number of complaints received.

In response to this last year a dedicated Housing Complaints Officer was added to the establishment. In the recent RSH inspection complaints was an area of focus, and an area that forms part of the Service Improvement Plan.

In 2025/26 the Housing Service received 260 Stage 1 complaints.

The role of Housing Complaints Officer is to complete the following tasks:

- Acknowledge all Stage 1 complaints, contacting the complainant by telephone to discuss their complaint further when required
- Write responses to all Stage 1 complaints, by reviewing information held on the housing management system and speaking to those involved
- Ensure that there is consistency in the responses sent, and that feedback is used to improve complaint responses
- Liaise with the Complaints and Compliments Officer to discuss cases where compensation may be appropriate, and seek the relevant approval for compensation
- Produce and monitor a log of all actions agreed as part of a Stage 1 complaint
- Produce quarterly reports to highlight the learning from complaints
- Work with Corporate Communications to highlight the positive work that is being undertaken and how the Housing service is learning from complaints

- Support the Complaints and Compliments Officer to obtain all information required for complaints that are escalated to Stage 2 and/or the Housing Ombudsman

The currently workload is higher than one officer can cover and an additional post is required. Other Nottinghamshire borough councils are taking similar steps, with one recently creating a team of a Senior Complaints Officer and two Complaints Invesitgators with their Housing Service.

The Housing Services and Strategy Manager (Grade 13) and the Housing Performance Manager (Grade 9) are now routinely completing Stage 1 responses as part of their work every week. Managers throughout the Housing Service have also been supporting the Housing Services and Strategy team during this time, in a similar way to before the Housing Complaints Officer was created. This means that many housing managers are having to prioritise complaint responses over other essential tasks.

In addition to this, the number of complaints received remains high and the HO and RSH expectations of the detailed responses required mean that responses take longer to draft than previously. There has also been an increase in the complexity of the complaints received, with many customers complaining about multiple concerns, leading to further time being required to investigate leading to the impact on our compliance rate.

Due to the limitation of resource, there has been a recent dependency on complaint extensions to try and best maintain the Council's complaint response compliancy and allow for sufficient allocation of resource to investigate the complaint. Of the 162 complaints that have been responded to within the timescales, 67 of these maintained compliancy through the use of extensions. The HO guidance is clear that landlords should not routinely be using extensions, as part of their complaints process. Where tenants are unhappy with the service provided, they are also on many occasions having an extended wait for this response, which compounds to the original matter that they made a complaint about. When mistakes are made, it is appropriate that these are investigated and resolved promptly.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

   Finance comments will be updated at the meeting as necessary.

7. Legal Implications

   Legal comments will be updated at the meeting as necessary.

8. Human Resources Implications

   The comments from the Human Resources Manager were as follows:

   HR supports the proposals and any recruitment in line with existing Recruitment policies.

9. Union Comments

   Union comments will be updated at the meeting as necessary.

10. Climate Change Implications

    The climate change implications are contained within the report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    Not applicable.

13. Background Papers

    Not applicable.

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Environment and Climate Change

Parks and Play Strategy

1. Purpose of Report

To seek approval to undertake a public consultation on the Council's revised Parks and Play Strategy.

2. Recommendation

Cabinet is asked to RESOLVE that the draft Parks and Play Strategy be approved for public consultation and that, following the consultation, the Strategy and consultation findings be reported to the Policy Overview Working Group (POWG) for consideration prior to being submitted to Cabinet for final approval.

3. Detail

Broxtowe Borough Council is undertaking a review and refresh of its Parks and Play Strategy to ensure it reflects current and future needs across the Borough. The existing strategy (2017–2025) has delivered a programme of improvements; however, changing demographics, evolving legislation, and increasing expectations around accessibility, inclusivity, health and wellbeing, and environmental sustainability require a renewed strategic approach.

The refreshed strategy will play a key role in informing and prioritising the Council's Pride in Parks investment programme. It will provide a clear framework for assessing and prioritising sites across the Borough, identifying areas of deficit, and directing future improvements. The strategy will also consider a range of key themes including accessibility and inclusivity, health and wellbeing, biodiversity and climate resilience, and long-term infrastructure and asset management.

The draft Parks and Play Strategy is attached at **Appendix 2**. This represents a working document which continues to be refined following internal review, and it is anticipated that a further updated version will be presented to Cabinet in due course. To support its development, a public consultation exercise will take place from 22 July to 30 September 2026. The consultation questions are included at **Appendix 1**, and will seek feedback from residents, stakeholders and user groups to inform the final version of the strategy.

An Equality Impact Assessment has been completed to support the development of the strategy and is attached at **Appendix 3**. This ensures that the strategy considers the needs of all users and supports inclusive access to parks and play spaces across the Borough.

Following the consultation, an updated draft of the strategy will be brought back to the Policy Overview and Working Group in November for fuller consideration. At that stage, the Working Group will be asked to recommend adoption of the strategy to Cabinet, with a view to formal approval in December 2026.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

The proposed consultation questions for the Parks and Play Strategy were considered by POWG. At this stage, feedback was sought on the consultation approach and questions rather than the content of the draft Strategy itself. Members recommended that the consultation period be extended by one month to take account of the summer holiday period and maximise opportunities for participation. Additional consultation questions were suggested and have been incorporated. POWG also identified further locations where paper copies of the consultation materials should be made available to improve accessibility and provided comments on the range of stakeholders who should be contacted and encouraged to take part in the consultation.

6. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

There are no additional financial implications to consider at this stage. Any significant budget implications going forward, over and above virement limits, would require approval by Cabinet.

7. Legal Implications

The comments from the Head of Legal Services were as follows:

Legal comments will be provided at the meeting.

8. Human Resources Implications

Not applicable.

9. Union Comments

Not applicable.

10. Climate Change Implications

    Whilst the consultation does not have any direct climate change implications, it supports the Council's wider objectives in relation to health and wellbeing, as set out in the Climate Change and Green Futures Strategy. The promotion and enhancement of parks and play spaces contributes to increased physical activity, improved mental wellbeing, and greater use of green infrastructure, all of which support more sustainable and resilient communities across the Borough.

11. Data Protection Compliance Implications

    Not applicable.

12. Equality Impact Assessment

    An equality impact assessment has been completed and is found in **Appendix 3.**

13. Background Papers

    Nil

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Appendix 1

No	Question	Multi-choice answers	Comments
	Are you responding to this consultation as a:	■ Member of the public ■ Agent, developer or landowner ■ District, county or town / parish councillor ■ Town / parish council ■ Neighbourhood Planning Group ■ Community or interest group ■ Statutory body (Environment Agency, National Highways, Natural England etc.) ■ Utility company or infrastructure provider ■ Business / organisation ■ Another planning authority ■ Other (please specify below)	Optional. Pick one. Free text box next to 'other'.
	If you are responding on behalf of an organisation, what is the name of that organisation?		Optional. Free text box
	Do you use play spaces in Broxtowe?	■ Yes as a user ■ Yes as a parent/carer of children ■ No	
1	On average, how often do you visit / experience the following types of parks and play space in Broxtowe? ■ Equipped play park ■ Youth space e.g. skate park, bmx track, teen shelter, basketball hoop	■ At least once a day ■ A couple of times a week ■ Every week ■ Every few weeks ■ Every month ■ Less than once a month ■ Never	Optional. Matrix style question. Pick one answer for each open space type.

No	Question	Multi-choice answers	Comments
	■ Other informal play elements e.g. deadwood logs, woodland, bouldering rocks, ■ Informal open space / park with no play equipment or elements		
2	If you visit parks and play spaces outside Broxtowe, why?		Free text box
3	How long does it take you to travel to the park or play area you most commonly use?	■ Under 10 minutes ■ 10 to 20 minutes ■ 20 – 30 minutes ■ 30 minutes – 1 hour ■ Longer than an hour	One answer only. Optional
4	How do you usually get there? (Tick as many as apply)	■ Walk ■ Cycle ■ Car ■ Public transport ■ Other	Optional, choose multiple
5	What benefits do you get from playing in the parks and play spaces in Broxtowe? (Respondents are then given options 1-5 (i.e. not a sliding bar), with 1 being no benefit and 5 being a major benefit) ■ Physical health benefits ■ Mental health / wellbeing benefits ■ Educational benefits ■ Opportunities to connect with nature ■ Opportunities for socialising ■ Other _____	■ 1 ■ 2 ■ 3 ■ 4 ■ 5	Optional. Matrix style question. Pick one answer for each open space type

No	Question	Multi-choice answers	Comments
6	Which (if any) of the following challenges prevent you using parks and play spaces in Broxtowe?	■ No suitable space nearby ■ Difficulty in accessing parks and play spaces ■ Lack of inclusive play equipment ■ No play facilities relevant to me (or accompanying child) ■ Bad weather ■ Antisocial behaviour ■ Poor maintenance / uncleanliness ■ NA	Optional. Multi-choice. No cap, no ranking.
7	How important do you think the following themes are for play in Broxtowe? Respondents are then given options 1-5 (i.e. not a sliding bar), with 1 being no benefit and 5 being a major benefit) ■ Inclusive and community-orientated ■ Active and healthy ■ Supporting wellbeing and development ■ Nature and climate-positive	■ 1 ■ 2 ■ 3 ■ 4 ■ 5	Optional. Matrix style question. Pick one answer for each theme
8	Which of the theme recommendations on the enhancement of parks and play provision in chapter 7 do you think should be prioritised?	■ Expand the amount and variety of inclusive equipment. ■ Work more closely with community, facilities, schools or sports clubs to increase opportunities for supervised play.	Optional. Multi-choice. No cap, Ranked from highest priority to lowest priority.

No	Question	Multi-choice answers	Comments
		■ Work with local communities to design new welcoming signage for play spaces. ■ Introduce an online 'reporting tool' to report any issues within parks. ■ Increase facilities for teenagers, (especially teenage girls) including social seating areas or large swings. ■ Increase provision of toilets within destination spaces. ■ Promote active travel routes to access open spaces and increase provision of cycle parking. ■ Establish dedicated BMX / mountain biking spaces away from local nature reserves. ■ Introduce ground graphics and signage which encourage physical activity within spaces. ■ Introduce play equipment which offers opportunities for jumping, crawling and hiding. ■ Introduce playful signage to encourage children to interact with the local heritage and nature within parks. ■ Inclusion of ground graphic games and wall murals within spaces.	

No	Question	Multi-choice answers	Comments
		■ Introduce more sensory play including musical equipment and sandpits. ■ Introduce 'themed' play areas which offer larger-scale imaginative play. ■ Introduce herbaceous and shrub planting along the edges of play areas. ■ Increase opportunities for natural play such ad den-building and nature trails within woodland. ■ Set play equipment within vegetated areas to increase connection with nature. ■ Ensure areas of shading and sustainable drainage features are integrated within play spaces.	
9	Are there any theme recommendations on the enhancement of parks and play in chapter 7 that you do not support?	■ Expand the amount and variety of inclusive equipment. ■ Work more closely with community, facilities, schools or sports clubs to increase opportunities for supervised play. ■ Work with local communities to design new welcoming signage for play spaces. ■ Introduce an online 'reporting tool' to report any issues within parks. ■ Increase facilities for teenagers, (especially teenage girls) including social seating areas or large swings.	Optional. Multi-choice. No cap, no ranking.

No	Question	Multi-choice answers	Comments
		■ Increase provision of toilets within destination spaces. ■ Promote active travel routes to access open spaces and increase provision of cycle parking. ■ Establish dedicated BMX / mountain biking spaces away from local nature reserves. ■ Introduce ground graphics and signage which encourage physical activity within spaces. ■ Introduce play equipment which offers opportunities for jumping, crawling and hiding. ■ Introduce playful signage to encourage children to interact with the local heritage and nature within parks. ■ Inclusion of ground graphic games and wall murals within spaces. ■ Introduce more sensory play including musical equipment and sandpits. ■ Introduce 'themed' play areas which offer larger-scale imaginative play. ■ Introduce herbaceous and shrub planting along the edges of play areas. ■ Increase opportunities for natural play such ad den-building and nature trails within woodland.	

No	Question	Multi-choice answers	Comments
		■ Set play equipment within vegetated areas to increase connection with nature. ■ Ensure areas of shading and sustainable drainage features are integrated within play spaces.	
10	Do you have any ideas / suggestions for further enhancements that could be included within the Parks and Play Strategy?		Optional. Free text box
11	Please let us know if there is anything else you would like to tell us about Parks and Play within Broxtowe. This could be things you like, dislike, or anything else you would like to say.		Optional. Free text box

Tell us about you

We want to make sure that our services are provided fairly and to those who need them. The information collected helps us to get a picture of who contacts us, uses or does not access our services, so will help us improve what we provide and reduce potential barriers to access.

Please answer the questions below by ticking the boxes that you feel most describe you. Some questions may feel personal, but the information we collect will be kept confidential and secure. The better the information is that we collect the most effective our monitoring will be.

No	Question	Multi-choice answers	Comments
12	Gender – How would you describe your gender?	☐ Male ☐ Female ☐ Another Way ☐ Prefer not to say	
13	Age – Which of the following age groups do you belong to?	☐ Under 18 ☐ 18-24	

No	Question	Multi-choice answers	Comments
		☐ 25-29 ☐ 30-44 ☐ 45-59 ☐ 60-64 ☐ 65+	
14	Ethnicity	☐ White English/Welsh/Scottish/Northern Ireland/British ☐ White Irish ☐ White Gypsy or Irish Traveller ☐ Any other White background ☐ White and Black Caribbean ☐ White and Black African ☐ White and Asian ☐ Any other mixed/multiple ethnic background ☐ Asian or Asian British Indian ☐ Asian or Asian British Pakistani ☐ Asian or Asian British Bangladeshi ☐ Asian or Asian British Chinese ☐ Any other Asian background ☐ African ☐ Caribbean ☐ Any other Black/African/Caribbean background	

No	Question	Multi-choice answers	Comments
		☐ Arab ☐ Any other ethnic group	
15	Whereabouts in Broxtowe do you live?	☐ Attenborough ☐ Awsworth ☐ Beeston ☐ Bramcote ☐ Brinsley ☐ Chilwell ☐ Cossall ☐ Eastwood ☐ Greasley ☐ Kimberley ☐ Nuthall ☐ Stapleford ☐ Strelley ☐ Toton ☐ Trowell ☐ Watnall ☐ Other (please specify)	
16	Do you consider yourself as disabled or have any long-tern health problems that limit daily activity?	☐ Yes ☐ No	
17	If you answered "Yes", please tell us which of the following best describes your disability, long-term health condition, or impairment (tick all that apply):	☐ Physical impairment or mobility condition ☐ Sensory impairment (e.g. sight or hearing) ☐ Learning disability or learning difficulty	

No	Question	Multi-choice answers	Comments
		☐ Neurodivergent condition (e.g. autism, ADHD, dyslexia) ☐ Mental health condition ☐ Long-term health condition (e.g. diabetes, arthritis, epilepsy, cancer) ☐ Speech, language or communication difficulty ☐ Other disability, health condition, or impairment ☐ Prefer not to say	

Broxtowe Parks and Play Strategy 2026 - 2035

Broxtowe Borough Council

Draft report
Prepared by LUC
May 2026

Version	Status	Prepared	Checked	Approved	Date
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Chapter 1
Introduction

Background

1.1 LUC was commissioned by Broxtowe Borough Council to prepare a Parks and Play Strategy (herein referred to as the 'Strategy'). The aim of the Strategy is to map and audit Council-managed play provision within the Borough. These findings will be used to provide an evidence base to inform the enhancement, management and development of play and parks provision across the Borough.

1.2 This Strategy will build on the current Broxtowe Borough Play Strategy (2017 - 2025) **[See reference 1]**, providing a holistic approach to play which builds on the Council's commitment to environmental sustainability, community well-being and inclusivity. Key aims of the Strategy include:

- Integrate play with wider blue green infrastructure (BGI), aligning with the principles contained in the Broxtowe BGI Strategy **[See reference 2]**. This includes consideration of provision for informal play opportunities to support creative, flexible and nature-based play experiences.
- Address current gaps in understanding wider accessibility and inclusion of play spaces, including through mapping of access catchments, and understanding how accessibility and inclusion contribute to overall quality and value of play spaces.
- Provide guidance on decision making for planners and offer a framework for Section 106 allocations.

Summary of approach

1.3 The project methodology has been divided into three distinct stages, as outlined below:

- **Phase 1: Understanding existing context**
  - A desk-based review was undertaken to understand the key policies and strategic context for the planning and management of parks and play in Broxtowe.

- In parallel to this, mapping of the Borough's parks and play provision was collated.

- **Phase 2: Assessing current provision**
  - The mapped data was analysed to understand the quantity and pattern of parks and play provision across the Borough.
  - Access catchments were mapped to understand where residents in the Borough have access to parks and play. These catchments were based on the best practice principles outlined within the Fields in Trust standards.
  - Site audits were completed to assess the quality and value of parks and play provision across the Borough, structured around four themes. A copy of the site audit form can be found in **Appendix A**.
- **Phase 3: Recommendations and delivery**
  - Based on the assessment of current provision, a series of recommendations to enhance play and parks provision across the Borough were developed.
  - Delivery and funding mechanisms required to achieve these recommendations were defined.

Defining play

1.4 Play is critical to the physical and emotional development of children. It is fundamental in supporting individuals to connect with their environment and develop inter- and intrapersonal skills.

1.5 To define play can be difficult, as it can vary significantly between individuals. Play England – Charter for Play uses the definition *'what children and young people do when they follow their own ideas and interests, in their own way, and for their own reasons'* **[See reference** 3**]**. In 2004, the Play Work Principles Scrutiny Group developed a professional and ethical framework for playworkers and play work **[See reference** 4**]**. Principles one and two of the Play Work Principles help further define play:

- All children and young people need to play. The impulse to play is innate. Play is a biological, psychological, and social necessity, and is fundamental to the healthy development and well-being of individuals and communities.
- Play is a process that is freely chosen, personally directed and intrinsically motivated. That is, children and young people determine and control the content and intent of their play, by following their own instincts, ideas and interests, in their own way for their own reasons.

1.6 As play is a creative act, characteristics and behaviours of play are both broad and diverse. Play behaviours may include running, jumping, chasing, rules-based games / invented games, play fighting, shouting, role-playing, imagination and fantasy, creating and destroying, use of objects and loose parts, and risk-taking. The definition of play in this Strategy should be considered separately from organised activities, groups, clubs, and classes. These often have external rules and conditions, which are generally defined by adults.

1.7 Play can be loosely grouped into three main activities and behaviours that encourage development. Good design of parks and play provision should help facilitate and promote all these activities. These activities include:

- Imaginative play;
- Physical play; and
- Social play.

Scope of play within this Strategy

1.8 This Strategy considers outdoor play provision across the Borough, including provision within parks, as well as 'standalone' play provision in other locations. The focus of the Strategy is on Council and Parish Council-owned / managed play spaces and parks. The following play types are considered:

- Local Areas for Play (LAP): Small areas of open space, dedicated to play for very young children.
- Local Equipped Area for Play (LEAP): Equipped areas of play for children up to 8 years.
- Neighbourhood Equipped Area for Play (NEAP): Equipped areas of play for older children and teenagers.
- Youth space: Informal play spaces such as Multi-Use Games Areas (MUGA), pump track / BMX tracks, skate parks bouldering walls, green gyms or social areas.
- Informal play: Open spaces that support informal play through playful design, e.g. bouldering areas, natural play or sensory routes.

1.9 There is a wide variety of form and setting of play provision which should be considered. Examples of other types of play provision that are excluded from this Strategy include:

- Supervised play sessions;

- Play in schools, play groups, etc.;
- Formal sports provision for organised use (e.g. club use); and
- Soft play centres.

Benefits of play

1.10 This Strategy emphasises the importance of play for children and young people's well-being, health and development.

1.11 Key benefits of play coincide with a child's physical, mental and emotional health, well-being and development. Play England **[See reference 5]** research has evidenced these benefits. The key findings of this research can be summarised as follows:

- **Physical activity:**
  - Play encourages movement and healthy development. Active play is the most common form of physical activity for children outside of school, and those that walk and play together tend to have greater levels of activity in other areas of their lives.
- **Physical development:**
  - Play can help to develop strong bones, muscle strength, lung capacity and sophisticated physicals skills and co-ordinated movements from an early age.
- **Cognitive development:**
  - Play can help to support progression of language and problem-solving skills, gaining perspective, memory and creativity from an early age.
- **Mental health and emotional well-being:**
  - Play can improve mental health and support psychological development which helps children to express themselves. It encourages the exploration of confusing or painful feelings and builds resilience from understanding of relationships and experiencing positive feelings and reactions. Imaginative play can particularly develop emotional well-being, self-control, control of fear and anxiety and empathy.
- **Social development:**
  - Play can help facilitate connections with others, as it often is a social experience, shared with others. Children can create and establish and strengthen friendships through play.

- **Connection to the natural environment:**
  - Outdoor play and contact with nature can improve a child's ability to concentrate and be self-disciplined, gather information and understand their local environment.

Introduction to the themed approach

1.12 A 'themed' approach was adopted to explore how parks and play facilities in the Borough deliver these benefits. Whilst there are some overlaps between the themes, this structure will be used to provide a broad overview of the performance of the Borough's parks and play spaces. The four themes are listed below:



- **Inclusive and community orientated:**
  - This theme considers the availability and accessibility of play for everyone – including all ages, abilities, cultures and genders.
  - The wider needs of the wider community, including opportunities for bring people together and promoting social cohesion, are studied. Factors such as youth engagement and co-design within play are also outlined.



- **Active and healthy:**
  - This theme is centred on how play encourages physical activity and helps children lead active and healthy lives, including increased movement and physical activity.
  - Key principles of play equipment safety are also included.



- **Supporting well-being and development:**
  - This theme reflects the opportunities that play spaces provide to foster learning and understand risk. Consideration is also given to imaginative and social play elements, as well as learning opportunities integrated within play.
  - Factors which ensure spaces are safe and attractive spaces for children to be in and have fun are also outlined.



- **Nature and climate positive:**
  - This theme focuses on ensuring children have opportunities to connect with nature, providing young people with positive attitudes towards the environment. This includes provision of natural play and elements of the natural environment close to where children play.
  - Approaches that ensure play is resilient to a changing climate, whilst supporting nature and biodiversity approaches are also incorporated within this theme. This includes the use of nature-based solutions, as well as the use of sustainable materials.

Structure of the document

1.13 The remainder of this Strategy is structured as follows.

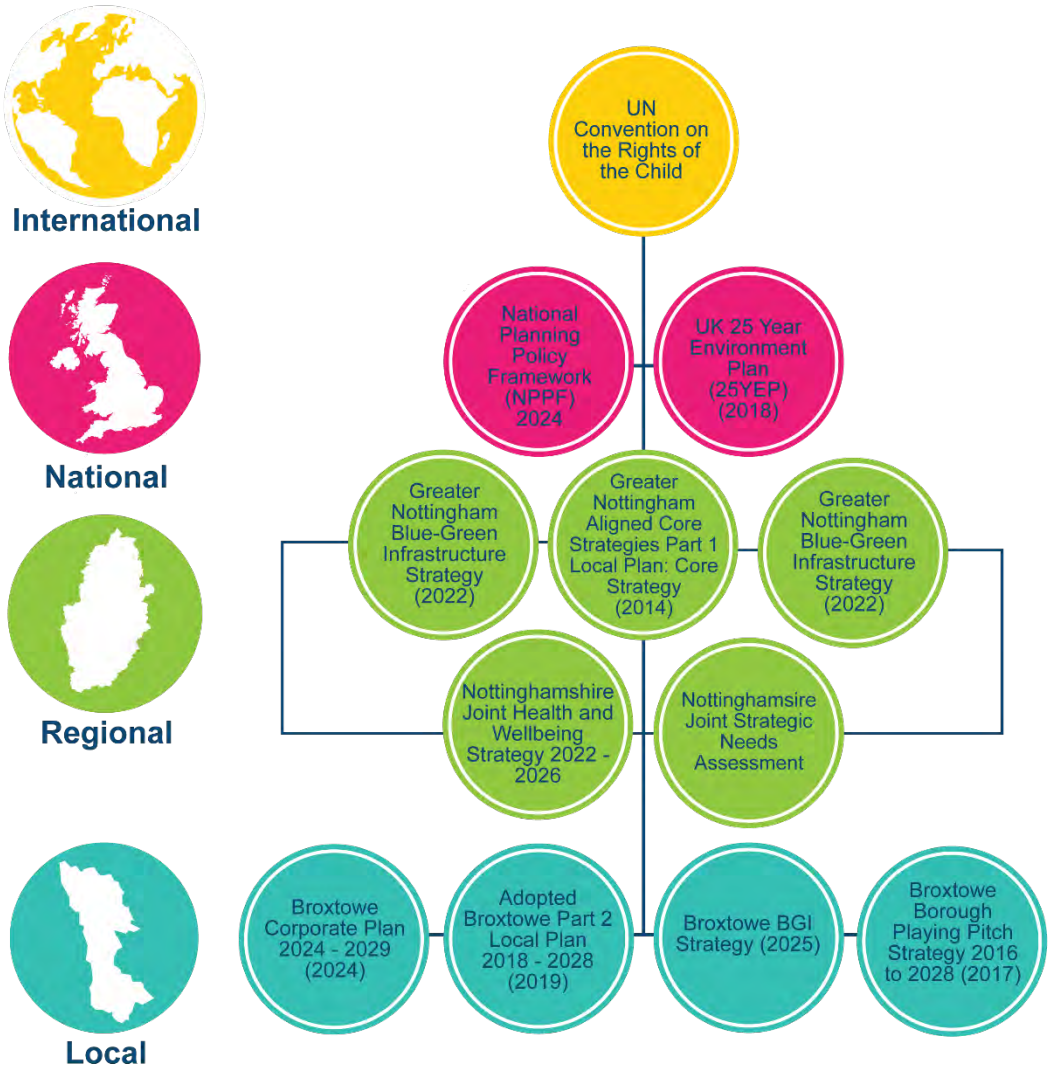
- **Chapter 2: Planning policy and strategic context**
  - Provides an overview of the policy context influencing play provision in the Borough.
- **Chapter 3: Understanding the need for play provision in Broxtowe**
  - Structured by the four themes, the section analyses the need for play in the Borough.

- **Chapter 3: Overview of play provision in Broxtowe**
  - Sets out the play provision considered as part of this Strategy.
- **Chapter 5: Quality and value assessment**
  - Provides an overview of the quality and value of parks and play spaces informed by a site audit of these spaces. The performance of spaces is considered per theme and a benchmark score to set a standard for quality and value is set.
- **Chapter 6: Quantity and accessibility assessment**
  - Provides an overview of the quantity of different types of park and play (compared to the population). The second half of this chapter sets accessibility buffers around parks and play spaces to understand proximity of residents to play spaces.
- **Chapter 7: Priorities and recommendations**
  - Brings together findings from the quantity, accessibility, quality and value analysis to set out priority recommendations per theme and for different locations. This also brings together the findings from the needs analysis to provide an overall combined play needs index and combined play provision index.
- **Chapter 8 Play infrastructure policies**
  - Sets out policies for play in Broxtowe to ensure that play is delivered to a high standard going forward. This includes recommendations for securing investment through development.

Chapter 2
Planning policy and strategic context

2.1 This chapter sets out the international, national, regional and local planning and policy context which influences play within the Borough. The policies considered are shown in **Figure 2.1**.

Figure 2.1 Policy context



International policy

UN Convention on the Rights of the Child

2.2 The United Nations Convention on the Rights of the Child (UNCRC) establishes the international policy foundation for children's recreation **[See reference 6]**. Adopted by the UK in 1992, the UNCRC places a duty on authorities to protect and promote play opportunities for all young people up to 18 years of age. The UNCRC states that delivering accessible play spaces is a fundamental human right. Specifically, Article 31:

1. States parties recognize the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.

2. States parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.

National policy

National Planning Policy Framework

2.3 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied **[See reference 7]**. The NPPF sets out requirements for open space assessment, including the importance of considering open space, green infrastructure (GI) and sports provision in the development of local plans. Relevant chapters and policies relevant to this Strategy include:

- Chapter 2: Achieving sustainable development. The NPPF establishes three overarching objectives for sustainable development. This includes a social objective, which seeks to
  - "*to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being*."

- Chapter 8: Promoting healthy and safe communities. This chapter is relevant to the provision and protection of play spaces and states. Specifically, the following paragraphs:
  - Paragraph 96. c): "*Planning policies and decisions should aim to achieve healthy, inclusive and safe places which* […] *enable and support healthy lives, through both promoting good health and preventing ill-health, especially where this would address identified local health and well-being needs and reduce health inequalities between the most and least deprived communities – for example through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling*."
  - Paragraph 98 a): "*To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should* […] *plan positively for the provision and use of shared spaces, community facilities (such as local shops, meeting places, sports venues, open space, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of communities and residential environments*."
  - Paragraph 103: "*Access to a network of high quality open spaces and opportunities for sport and physical activity is important for the health and well-being of communities, and can deliver wider benefits for nature and support efforts to address climate change. Planning policies should be based on robust and up-to-date assessments of the need for open space, sport and recreation facilities (including quantitative or qualitative deficits or surpluses) and opportunities for new provision. Information gained from the assessments should be used to determine what open space, sport and recreational provision is needed, which plans should then seek to accommodate*."
  - Paragraph 104: "*Existing open space, sports and recreational buildings and land, including playing fields and formal play spaces, should not be built on unless:*

    a) an assessment has been undertaken which has clearly shown the open space, buildings or land to be surplus to requirements; or

    b) the loss resulting from the proposed development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable location; or

    c) the development is for alternative sports and recreational provision, the benefits of which clearly outweigh the loss of the current or former use."

- Chapter 12: Achieving well-designed places: This chapter states that planning decisions must ensure developments establish a strong sense of place. Of particular relevance is paragraph 135 e), which states that "*Planning policies and decisions should ensure that developments* […] *optimise the potential of the site to accommodate and sustain an appropriate amount and mix of development (including green and other public space) and support local facilities and transport networks*."

25 Year Environment Plan

2.4 The UK Government's 25 Year Environment Plan establishes a natural capital framework to improve the environment within a generation **[See reference 8]**. The document sets out ten goals and six key areas to achieve this overarching vision. The following goals and chapter relevant to this Strategy include:

- Goal 6: Enhanced beauty, heritage and engagement with the natural environment.
- Chapter 3: Connecting people with the environment to improve health and well-being. This chapter focuses on improving public access to nature and outlines specific policies including:
  - "Encouraging children to be close to nature, in and out of school": This policy recognises that playing and learning outside is a fundamental part of childhood that helps children grow up healthy.
  - "Helping people improve their health and well-being by using green spaces": This promotes the natural environment as a resource for preventative and therapeutic health purposes.
  - "Greening towns and cities": This focuses on creating better quality green infrastructure to make urban areas attractive places to live and work, while encouraging social interaction.

2.5 The approach to helping people improve their health and well-being by using green spaces is centred on the need to improve connections between people and the environment. A key consideration is encouraging children to be close to the natural environment. Focus is also given to the role of green spaces as a mechanism to combat mental health illness, as an educational tool or as inter-generational social space. Play spaces can be particularly important to help children connect to nature.

Regional

Greater Nottingham Strategic Plan – Publication Draft (2025)

Currently submitted for examination. To be updated if adopted.

2.6 The Greater Nottinghamshire Planning Partnership (comprising Broxtowe Borough, Nottingham City and Rushcliffe Borough Councils) are preparing the Greater Nottingham Strategic Plan, which will set out policies to secure sustainable growth up to 2041. The Regulation 19 Publication Draft Greater Nottingham Strategic Plan **[See reference 9]** was submitted for examination in March 2025. It includes the following Spatial Objectives of key relevance to parks and play delivery:

- 7) Achieving well-designed places in Greater Nottingham
- 8) Strong, safe, healthy and cohesive communities
- 9) Opportunities for all; and
- 11) Protecting and improving natural assets - including BGI and open spaces.

2.7 Policy 16: Blue and Green Infrastructure, Parks and Open Space outlines the strategic approach to BGI generally in Greater Nottingham, including parks and open space. Individual strategic site allocation policies identify requirements for parks and play provision in new development, to be delivered at an appropriate scale to meet the needs of new development.

Greater Nottingham Blue Green Infrastructure Strategy (2022)

2.8 The Greater Nottingham Planning Partnership produced a regional-level BGI Strategy **[See reference** 10**]** to inform the preparation of the Greater Nottingham Strategic plan and the development of policies and plans within it. The plan sets out ten key priorities for BGI, key national and local planning priorities, and regional and local BGI initiatives. Across the Greater Nottingham region, the Strategy identifies:

- ‘Primary Strategic Networks’ which have regional or sub-regional significance (such as the Trent Valley or the Erewash Canal / river Erewash);
- ‘Secondary Strategic Networks’ which may have significance due to their connectivity with the primary network, provision of cross-boundary links between neighbouring authorities, importance for outlying settlements/wider rural areas, or other strategic importance due to their land use, connectivity or function.

- ‘Urban Fringe GI Enhancement Zones’ surrounding the main urban area of Nottingham. These zones are identified to represent a significant resource for urban communities and already experience urban edge pressures.
- ‘Local / Neighbourhood Networks’ generally connect local communication within settlements or urban areas or provide links to other areas of the BGI network.
- ‘Biodiversity Opportunity Areas’ are based on the existing ecological network, including biodiversity focal areas and existing areas of connectivity.

2.9 Appendix E of the BGI Strategy outlines Greater Nottingham's existing Recreational Green Infrastructure resource, including 'Children's and Young People's Play Spaces' (E1), 'Outdoor Sports Pitches' (E2) and 'Parks, Gardens and Recreation Grounds' (E3).

Adopted Greater Nottingham Aligned Core Strategies Part 1 Local Plan: Core Strategy (2014)

Superseded if Greater Nottingham strategic plan adopted

2.10 The Aligned Core Strategy **[See reference** 11**]** forms part of the adopted Broxtowe Local Plan and sets out the vision, objectives, spatial strategy and strategic policies for the Borough up to 2028. Neighbouring councils have worked together to ensure that core planning policies are consistent across Greater Nottingham. The Core Strategy covers:

- **Section A: Sustainable Growth** reinforces the presumption in favour of sustainable development, contained within NPPF, ensuring that development proposals are considered against the core policies related to climate change, strategic spatial growth, the Green Belt, employment provision and economic development, town and local centres, and regeneration priorities.
- **Section B: Places for People** sets out the principles of good development relating to housing provision, design principes, the historic environment, local services and healthy lifestyles, culture, tourism and sport, travel demands and transport infrastructure priorities.
- **Section C: Our Environment** sets out priorities for the environment and biodiversity in a strategic and comprehensive way, including Policy 16: ‘Green Infrastructure, Parks and Open Space’ which supports the delivery, protection and enhancement of GI through a network of regional and sub-regional GI corridors and assets.

Nottinghamshire Joint Health and Well-being Strategy 2022 – 2026

2.11 The Nottinghamshire County's Joint Health and Well-being Strategy **[See reference** 12**]** aims to support people to live happy and healthier lives, prosper in their communities and remain independent in later life. It is underpinned by four overarching ambitions, including:

- Give every child the best chance of maximising their potential; and
- Create healthy and sustainable places.

Nottinghamshire Joint Strategic Needs Assessment (2020)

2.12 The Nottingham and Nottinghamshire Joint Strategic Needs Assessment (JSNA) assesses the current and future health and social care needs of the local community **[See reference** 13**]**. This evidence base underpins the Joint Health and Well-being Strategy. It provides an overview of the needs and assets of the County, informing recommendations for action to improve health and well-being and reduce health inequalities. The Nottinghamshire JSNA is structured around two dashboards: 'Health and Well-being' and 'Children and Young People'. Many of the themes raised within these themes can be addressed through play.

Borough

Broxtowe Corporate Plan 2024 – 2029 (2024)

2.13 The Corporate Plan **[See reference** 14**]** sets the vision for the Borough to be a *'greener, healthier Broxtowe where everyone prospers'*. It outlines aims and priorities for the Borough in relation to housing, the environment, business growth, community safety, leisure and health, and communications and engagement.

2.14 The plan includes five priorities, along with five values to help achieve these. 'Our priorities' set out within the Plan include:

- Housing – a good quality home for everyone;
- Business Growth – Invest in our towns and our people;
- Environment – Protect the environment for the future;
- Health – Healthy and supported communities; and

- Community Safety – A safe place for everyone.

2.15 Supporting play and parks can be designed and managed to help protect the environment, to support healthy communities and to create safe spaces for everyone.

2.16 Of key relevance, the document includes the following aims and objectives:

- Investing in parks and open spaces, including enhancing BGI corridors and ensuring biodiversity net gain positively enhances the environment.
- Promoting active and healthy lifestyles in every area of Broxtowe.
- Improving public safety including the public realm and cycle security infrastructure.

Adopted Broxtowe Part 2 Local Plan 2018 - 2028 (2019)

2.17 The Council adopted the Part 2 Local Plan in 2019 **[See reference** 15**]**. It sets out specific site allocations required to meet the housing need, as set out in the Core Strategy, as well as Borough level planning policies. Principles of key relevance to the delivery of play spaces in the Borough are outlined below:

- Site allocation policies include site-specific considerations and requirements for proposals, including key site sensitivities and infrastructure requirements, including contributions to open space and play facilities.
- Policy 17: Place-making, Design and Amenity
  - This policy sets out design principles for new development, including ensuring development is close to community facilities, creating a place with locally-inspired or otherwise distinctive character, and ensuring a satisfactory degree of amenity for occupiers of the new development and neighbouring properties.
  - Play can be designed to help developments meet these criteria, and form part of the amenity and community facilities that residents can enjoy.
- Policy 25: Culture, Tourism and Sport
  - This policy sets out that development should include provision for sports, including children's sport.
- Informal play spaces such as MUGAs can provide informal sport offers for children. Policy 28: Green Infrastructure Assets.

- This policy sets out requirements for proposals likely to lead to increased use of any GI asset in the Borough. Proposals are required to take reasonable opportunities to enhance these assets.

Broxtowe BGI Strategy (2025)

2.18 The Council has launched its new BGI Strategy **[See reference** 16**]** to shape a more connected, climate-resilient and nature-rich Borough. The Strategy brings together Broxtowe's natural and built environments into a single, integrated network, recognising that parks, rivers, trees, canals and open spaces all play a vital role in creating places where communities and wildlife can thrive. Replacing the Council's 2015 Green Infrastructure evidence base, this refreshed strategy reflects the latest priorities for climate action, biodiversity recovery and community well-being.

2.19 The document identifies six BGI zones in the Borough, with identified opportunities and an action plan for each zone. The overarching principles for BGI, such as providing multifunctionality within spaces, should provide a foundation for this Parks and Play strategy. Additionally, there are links between provision of parks and play with the 'active and healthy' theme within the BGI Strategy.

Broxtowe Borough Playing Pitch Strategy 2016 to 2028 (2017)

2.20 The Council's Playing Pitch Strategy **[See reference** 17**]** provides the evidence base for playing pitch community infrastructure priorities to inform the Council's Local Plan policies and site allocations. It helps guide strategic planning and investment decisions relating to playing pitch facilities in the Borough to 2028. The document includes an action plan of priorities and potential investment sites; including identification of sport-specific actions, area-specific actions and site-specific actions for playing pitches across the Borough.

Other guidance

Fields in Trust Standards

2.21 The Fields in Trust (FIT) Standards provide national guidelines for the provision and protection of parks, playgrounds, and green spaces **[See reference** 18**]**. The Standards are structured around six core themes:

- Accessible, safe and inclusive;

- Promote active, healthy lifestyles;
- Support mental well-being;
- Resilient to climate change;
- Provide space for nature to thrive; and
- Adaptable to community needs.

2.22 The guidance provides quantitative and accessibility benchmarks to inform local planning and assess existing provision. It recommends a minimum of 0.55 hectares of dedicated play space per 1,000 people. This is made up of 0.25 hectares of formal play space, and 0.30 hectares of informal play for all. These areas may include multi-use games areas (MUGAs), wheels parks, BMX tracks, play trails playable public art, and sensory routes.

2.23 More detailed play hierarchies are set out for setting accessibility catchments.

- **Local Areas for Play (LAPs)** are small areas of open space, dedicated to play for very young children. Features of a LAP include:
  - A minimum size of 100 square meters; and
  - Include features which encourage play (but does not necessarily need specific play equipment).
- **Local Equipped Areas for Play (LEAPs)** are equipped areas of open space aimed at young and independent children. Features of a LEAP include:
  - A minimum size of 400 square meters;
  - Provide equipment for children who are beginning to play independently, as well as for younger children with adult supervision; and
  - Be located within 400 metres walking distance from every home.
- **Neighbourhood Equipped Areas for Play (NEAPs**) are equipped areas of open space for older, more independent children, offering a wide range of play experiences. Features of a NEAP include:
  - A minimum size of 1,000 square meters;
  - Provide equipment for older children, including more challenging items of equipment;
  - Include space for informal recreation for playing group games and / or seating for older children and young people; and
  - Be located within 1,000 metres walking distance of every home.

- **Larger games areas** are a sub-set of informal play spaces offering dedicated spaces for a range of games (e.g. a MUGA). Features of these spaces include:
  - A minimum size of 1,000 square metres; and
  - Be located within 700 metres walking distance of every home.
- Other informal play spaces should be reached "*safely by children and young people"*, but no guidance is provided on specific distances for these spaces, and no minimum sizes are set out.

2.24 By using these benchmarks alongside local needs assessments, local authorities can ensure that development delivers equitable access to high quality and varied play infrastructure for all age groups.

Play England's Charter for Children's Play

2.25 Play England are a national charity campaigning for children and young people to have the freedom to enjoy their right to play.

2.26 Their Charter for Children's Play provides a framework for local authorities developing play strategies **[See reference** 19**]**. It uses the Dobson Report's definition of play, which is defined as "*what children and young people do when they follow their own ideas and interests, in their own way and for their own reasons*" **[See reference** 20**]**. The Charter establishes that playing is essential to a child's quality of life and is fundamental to their healthy physical, emotional, and social development.

2.27 To guide local provision, the Charter outlines several core tenets. These include:

- "***Children have the right to play.*** *All children and young people have the right to play and need to play free to choose what they do – lively or relaxed, noisy or quiet – with the chance to stretch and challenge themselves, take risks and enjoy freedom. The right to play is enshrined in Article 31 of the UN Convention on the Rights of the Child*."
- "***Every child needs time and space to play.*** *All children and young people – disabled and non-disabled – whatever their age, culture, ethnicity or social and economic background, need time and space to play freely and confidently with their peers, free of charge, indoors and outdoors, somewhere they feel safe. Play provision should actively include the widest range of children and seek to engage with those from minority groups*."
- "***Children should be able to play freely in their local areas.*** *Children have the same right to use and enjoy public space as others. Local streets, estates,*

green spaces, parks and town centres should be accessible for children and young people to move around in safety and offer places where they can play freely, experience nature, explore their environment and be with their friends."

Chapter 3
Understanding the need for play provision in Broxtowe

3.1 This chapter sets out the social and environmental context to play provision in the Borough. This review helps to understand the spatial variations in need for play across Broxtowe.

3.2 A number of national and local datasets have been examined including:

- Office for national Statistics – Census 2021
  - The census is undertaken by the Office for National Statistics every 10 years and collects data from all households across England and Wales. The last census took place in 2021.
- The Indices of Multiple Deprivation (IMD)
  - This is the standard measure of relative deprivation for small geographic neighbourhood areas (known as Lower Super Output Areas (LSOAs)) across England **[See reference** 21**]**. It combines information from seven domains including health, education, crime, and the living environment. IMD also includes the supplementary index: Income Deprivation Affecting Children (IDACI).
- Natural England Green Infrastructure Framework
  - This tool provides mapping for GI features and needs across England, including access to nature for children and vulnerability to climate change.

3.3 The needs analysis has also been informed by stakeholder engagement with officers and councillors for Broxtowe Borough Council. A summary of emerging issues raised through this engagement are included for each theme.

Inclusive and community orientated

Why inclusive and community-orientated play spaces are important

3.4 The 2010 Equalities Act requires reasonable measures to be put in place to ensure certain groups are not disadvantaged, including people with disabilities. In play spaces, this should allow children with various disabilities to have opportunities

to play. However, a 2015 Public Inquiry found that over 90% of parents to young children (0-5 years) with multiple needs did not feel their children had the same access to play **[See reference** 22**]**. Key barriers that have been highlighted by families with disabled members include a lack of choices (particularly for those who need to remain seated in a buggy or wheelchair); a lack of appropriate toilet facilities, as well as negative societal attitudes **[See reference** 23**]**. A key consideration when providing for accessible play space is to consider the inclusivity of play provision. This incorporates features or facilities that can provide for a range of needs, allowing children to play together **[See reference** 24**]**.

3.5 National data shows that children and young people from Asian, black, and other minority ethnic backgrounds remain the least likely to be physically active, highlighting a critical need for targeted play provision **[See reference** 25**]**. These disparities can be exacerbated by the built environment. Public park design often reflects the tastes of majority demographics and can inadvertently exclude minority ethnic or religious groups by failing to provide culturally sensitive spaces, such as places separate from dogs **[See reference** 26**]**. Furthermore, different cultural groups may hold differing preferences for landscape aesthetics. For example, more ecological or “wild” designs do not uniformly appeal to everyone **[See reference** 27**]**.

3.6 Future play provision must address the specific needs of different genders as children grow into teenagers. National research into teenage play reveals that standard adolescent provisions like MUGAs and skate parks are overwhelmingly dominated by boys, leaving teenage girls feeling they have “nowhere to go and nothing to do” **[See reference** 28**]**. Broxtowe’s play provision can attract a more diverse gender demographic through play design that addresses the “gender play gap” **[See reference** 29**]**, such as including facilities like social seating and walking loops **[See reference** 30**]**.

The need for inclusive and community-orientated play spaces in Broxtowe

3.7 Broxtowe is a Borough that is more densely populated than most in England, recording a population density of 1,385 residents per square kilometre according to the 2021 Census **[See reference** 31**]**. Broxtowe ranks as the eighth most densely populated local authority area out of the 35 within the East Midlands **[See reference** 32**]**.

3.8 The Borough has an aging population. Between 2011 and 2021, the population of children aged under 15 grew by just 0.5%, compared to a 5% average growth rate for this age group across England **[See reference** 33**]**. The population increase for

people aged 65 and over was much higher in Broxtowe, at 20% **[See reference** 34**]**. Across the Borough, children and young people aged 19 and under make up just over 20% of the total population **[See reference** 35**]**. **Figure 3.1a** shows the variation in child population density across the Borough. Areas with a greater proportion of children will have a greater need for play provision to ensure there is sufficient space for all children to play.

3.9 Findings from the 2021 Census indicate that 7.3% of the Borough's residents identified as being disabled or limited a lot in mobility, and a further 11% identified as being disabled and limited a little in mobility. This is roughly in line with the average for England **[See reference** 36**]**. Additionally, according to the Health and Disability domain in the IMD, the Borough as a whole is within the 40% least health-deprived parts of England, indicating that the Borough is slightly better than the national average **[See reference** 37**]**. Whilst the statistical representation of disabled residents is relatively low, it is important that everyone is included within spatial planning needs.

3.10 The Borough's ethnic profile is predominantly white, with 88.9% of residents identifying with this ethnic group **[See reference** 38**]**. This is higher than the England average of 81.0% **[See reference** 39**]**. Other ethnic communities represent a smaller proportion of the local population when compared to national averages. The Asian, Asian British, or Asian Welsh demographic comprises 5.5% of Broxtowe's population **[See reference** 40**]**. Residents identifying as black, black British, black Welsh, Caribbean, or African make up 1.7% of the local population, compared to the England average of 4.2% **[See reference** 41**]**. Despite the smaller statistical representation, providing equitable play spaces for minority ethnic children is an important spatial planning requirement.

3.11 As a whole, the Borough is among the less deprived half nationally for child income deprivation **[See reference** 42**]**. However, there are distinct inequalities within the Borough. Areas of Eastwood St Mary's, Beeston Central, Chilwell West, Eastwood Hilltop, Eastwood St Mary's, and Stapleford North are among the 20% most deprived nationally in terms of Income Deprivation Affecting Children Index (IDACI). In areas of greater deprivation, children may have less access to other (including paid-for) play opportunities. Therefore there may be a greater need for play provision within these locations. This is shown in **Figure 3.1b**.

Figure 3.1a Child population in Broxtowe

Broxtowe borough
Analysis area

Proportion of LSOA population under 15 (%)

6.7 - 10
11 - 15
16 - 20
21 - 25

Figure 3.1b Income deprivation affecting children in Broxtowe

Broxtowe borough
Analysis area

Index of Multiple Deprivation - Income Deprivation Affecting Children Index Decile

1 - Most deprived
2
3
4
5
6
7
8
9
10 - Least deprived

0 1.5 3 km

Map scale 1:75,000 @ A3

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During stakeholder engagement, the need for disabled play equipment was a key issue being raised. Additionally, it was noted that there needed to be more play equipment for older children and teenagers. Further barriers to play for some groups including a lack of toilet facilities on site and access barriers into the site, including poor pathways and steep gradients. There was a desire to make play provision equitable across the borough. Another consideration raised was the need to ensure activities offered safe spaces for everyone, for example concerns were raised over motorbikes and off-road bikes coming into parks. However, others noted that this was a playful activity for some and there needed to be safe spaces for this to take place.

Active and healthy

Why active and healthy play spaces are important

3.12 A major long-term health priority in England is tackling obesity, with an estimated two-thirds of adults estimated to be over a healthy weight. This can lead to challenges such as an increased risk of cardiovascular diseases, type 2 diabetes and liver and respiratory disease **[See reference** 43**]**. Evidence shows that children who are physically active, including through play, are more likely to continue these habits into adulthood and less likely to be at risk from weight-related health challenges **[See reference** 44**]**.

3.13 Currently, fewer than half of the children and young people in England meet the Chief Medical Officers' guideline of averaging at least sixty minutes of physical activity per day **[See reference** 45**]**. As discussed in paragraph 3.6, this problem is acute for girls as their physical activity levels tend to drop off from the age of 10. This is in large part due to fewer facilities that are appealing to them and also due to open spaces that are less welcoming or practical. When asked directly, children and young people consistently identify the provision of playgrounds and age-appropriate equipment as the most important factor that would encourage them to spend more time outdoors **[See reference** 46**]**. Providing active, inclusive, and engaging play spaces allows for higher levels of participation in sport and physical activity, which are strongly associated with increased happiness, resilience, and overall mental well-being in children and teenagers **[See reference** 47**]**. Perceptions of safety impact outdoor recreation, as fear of crime and anti-social behaviour can be barrier to the use of play spaces, affecting some parts of the population more than others. There are also important links between safety and the inclusion and community-orientated

theme. Safety concerns in Broxtowe are gendered, with only 53.6% of females in the Borough report feeling safe after dark, compared to 73.0% of males **[See reference** 48**]**. This mirrors national trends as 41% of girls aged 11 to 16 and 49% of young women aged 17 to 21 report feeling unsafe when they go outside **[See reference** 49**]**. Additionally, girls of colour are disproportionately targeted by racial discrimination and harassment, severely limiting their freedom to access outdoor play spaces safely **[See reference** 50**]**.

3.14 Other elements of the living environment can also influence the safety of play spaces. Globally, air pollution is now the leading contributor to health disease and in the UK is the second leading risk factor for death in children under 5 **[See reference** 51**]**. Additionally, long-term exposure to noise levels exceeding 50dB have significant impacts on health and well-being **[See reference** 52**]**.

The need for active and healthy play spaces in Broxtowe

3.15 As noted in paragraph 3.9, the Health and Disability domain in the IMD indicates Broxtowe as a whole is slightly better than the national average. However, there are health inequalities within the Borough, including parts of Eastwood Hilltop, Eastwood St Mary's, Kimberley, and Chilwell West **[See reference** 53**]** (see **Figure 3.2a**). The prevalence of children with obesity in Nottinghamshire is 10% of Reception and 23% of Year 6 classes. This is similar to the average for England **[See reference** 54**]**.

3.16 In Broxtowe, 53.9% of children and young people are physically active **[See reference** 55**]**. This is fairly consistent across the Borough with lowest levels of activity recorded in Eastwood (52.3%), compared to the highest levels in Toton (54.3%) **[See reference** 56**]**. This is slightly higher than regional and national average. Sport England's Active Lives survey shows that boys are slightly more active than girls (54.7% vs 51.8%) **[See reference** 57**]**. **Figure 3.2b** shows the activity levels of children and young people across Broxtowe.

3.17 The crime domain of the IMD shows the Borough is among the less deprived half of England **[See reference** 58**]** and Broxtowe's community safety partnership ranks as the best performing for overall crime and violent offences, compared to similar local authorities within South Nottinghamshire **[See reference** 59**]**. However, anti-social behaviour remains persistently high, with a baseline rate of 19.6 incidents per 1,000 population and violent crimes constitute the highest proportion of all crime categories within the Borough **[See reference** 60**]**. Areas within Broxtowe which score as having a greater deprivation for crime include Eastwood St Mary's, Stapleford North, Beeston Central, Chilwell West **[See reference** 61**]**.

Figure 3.2a Health need in Broxtowe

Broxtowe borough

Analysis area

Index of Multiple Deprivation - Health Decile

1 - Most deprived

2

3

4

5

6

7

8

9

10 - Least deprived

Figure 3.2b Activity levels for children and young people in Broxtowe

Broxtowe borough

Analysis area

Percentage of children and young people who are physically active (those doing an average of 60+ minutes of at least moderate physical activity per day)

Highest (55%)

Lowest (51%)

0 1.5 3 km

Map scale 1:75,000 @ A3

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3.18 In 2021, air pollution levels in Broxtowe for nitrogen dioxide (NO_2), were below the national objective of 40µg/m³ at all monitoring sites **[See reference** 62**]**. Pollution related to $PM_{2.5}$ particulate matter, showed the highest levels are recorded in the south of the Borough, at the eastern extents of Beeston and at land associated with Toton Sidings. Other areas of relatively higher concentrations of $PM_{2.5}$ are found around settlements (including Stapleford, Eastwood, Kimberley and Beeston) as well as areas along the M1 corridor. Much of the central areas of the Borough experience noise pollution greater than 55dB from roads, particularly from the M1 and minor road networks. There are also areas in the west and south of the Borough which experience high noise levels from the Nottingham to Leeds and Nottingham to Matlock rail lines.

Stakeholder engagement highlighted links between active travel and play were also made. Parking pressures are an issue in some play spaces, and an emphasis on ensuring play spaces can be reached by walking, cycling and public transport was important. Additionally, the requirement for bike racks near playing fields and MUGAs was discussed. In particular the need for a cycle track at Inham Nook was also identified

Supporting well-being and development

Why play spaces which support well-being and development are important

3.19 Play is an important aspect of early childhood education and development, with all aspects of learning and development linked to play for very young children. Play can support cognitive development including developing language skills, problem solving, memory and creativity. It has also been shown to influence the way a child's brain develops. Play can also allow young people to develop social skills, including learning how to cooperate, help and share **[See reference** 63**]**.

3.20 Parks and play spaces can be particularly important in allowing children to learn and develop. Spending time in greener environments is directly linked to improved motor skills, better learning processes, and positive behavioural outcomes in young people **[See reference** 64**]**. Exposure to green spaces can also positively impact the neuropsychological development of attention and working memory **[See reference** 65**]**. Furthermore, research indicates a link between greater exposure to green spaces and reduced rates of both hyperactivity and inattention in youth **[See**

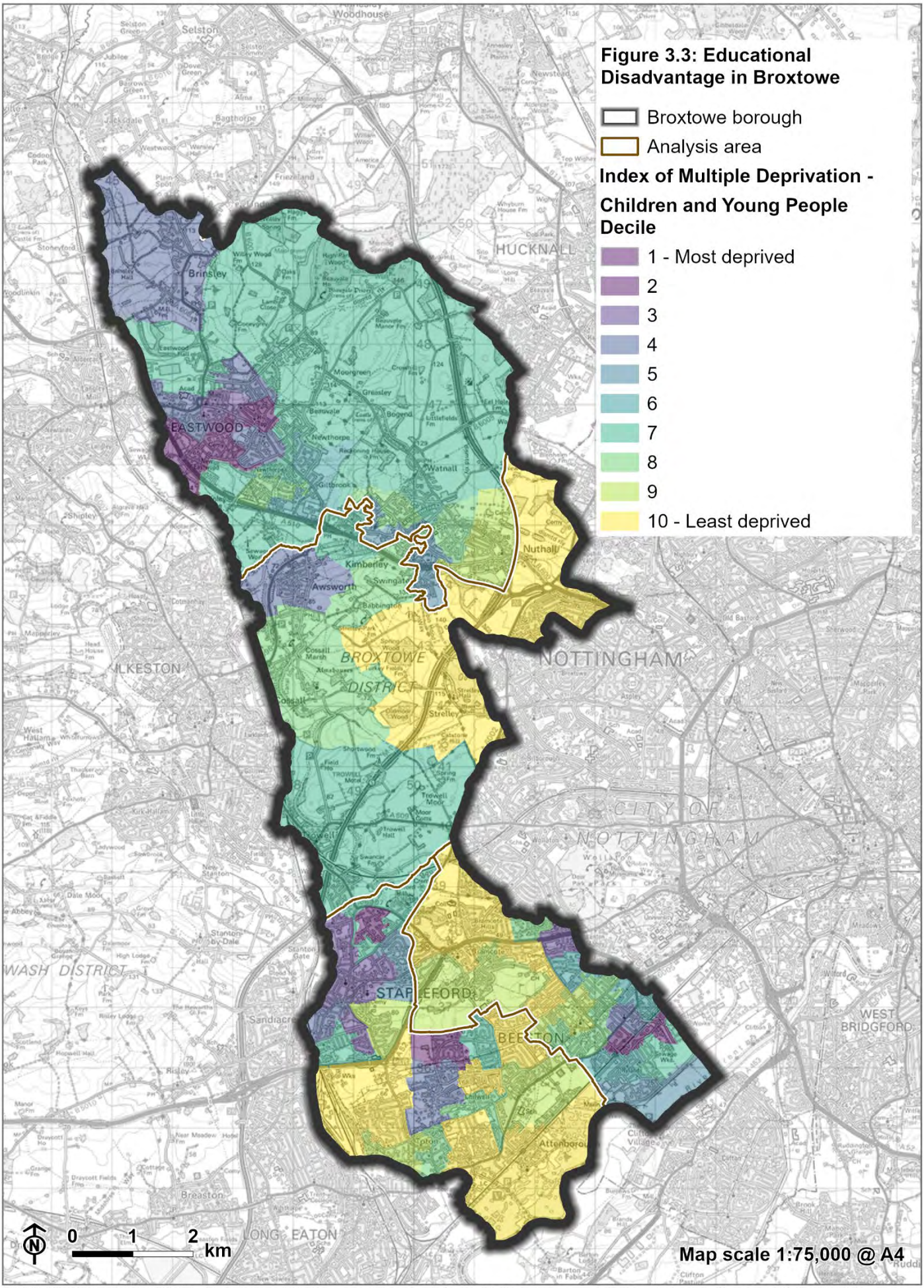
reference 66**]** and higher levels of school green space, particularly tree cover, are associated with enhanced academic performance, including higher grades **[See reference** 67**]**.

3.21 In addition to supporting development, play has been shown to build children's mental health. Evidence showing that children who regularly play with their parents are less likely to develop anxiety, depression, aggression and sleep problems **[See reference** 68**]**. Free play, including informal imaginative and social play can allow children to express their worries and concerns through play **[See reference** 69**]**.

3.22 Studies and reports have also found a gap between girls' and boys' mental health, particularly among teenagers and young adults. Young women between the ages of 16 and 24 are almost three times as likely to experience a common mental health issue as men of the same age **[See reference** 70**]**. Five times as many girls self-harm than boys, and nine times as many are hospitalised for eating disorders **[See reference** 71**]**. Creating safe spaces for girls of all ages to play is important to support health and well-being.

The need for play spaces which support well-being and development in Broxtowe

3.23 Early years development in the Borough is slightly lower than national levels. 79.6% of Broxtowe's 5-year-olds are at the expected level for communication and language, 68.7% meet the expected level for literacy, and 77.8% meet the expected level for maths **[See reference** 72**]**. At Key Stage 2 and GCSE level the average across Broxtowe is more similar to the average across England. However, there is variation within the Borough. Areas in Beeston North, Eastwood St Mary's, Stapleford North, Stapleford South East and Stapleford South West fall within the 30% most deprived neighbourhoods nationally on the Children and Young People Sub-domain of the Indices of Multiple Deprivation, which measures educational disadvantage experienced during childhood and adolescence **[See reference** 73**]**. This is shown in **Figure 3.3**.



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3.24 Levels of well-being in the Borough is lower than the national average for some categories. Across all ages, there is a lower than average self-reporting of life satisfaction and feeling life is worthwhile **[See reference** 74**]**. Additionally, in Broxtowe children in Years 7-11 report slightly lower levels of happiness, life satisfaction, and life worthwhileness compared to children in the rest of the East Midlands and across England **[See reference** 75**]**. Broxtowe has one of the highest rates of hospital admissions for mental health conditions for under 18 year-olds in the East Midlands **[See reference** 76**]**. The Nottingham and Nottinghamshire Joint Spatial Needs Assessment estimated that approximately 74,000 children sought help for mental health concern in 2021, and around 17,000 have a mental health disorder. For ages 7 – 10 **[See reference** 77**]**.

Stakeholder engagement highlighted that there is plenty of greenspace across Broxtowe that does not offer any kind of challenging or enticing play. For example green space between residences around Ribblesdale Court in Chilwell. Inclusion of natural informal play elements and signage encourage children to play could help make use of these spaces. Additionally, stakeholders noted that equipped play often did not include risk aversion which can be an important part of developing through play.

Nature and climate positive

Why nature and climate positive play spaces are important

3.25 In addition to contributing to the educational and developmental benefits of play, integrating nature into play spaces can also support biodiversity. This includes providing connections with nature and the promotion of resilient play spaces that can support play through the impacts of a changing climate. Children and young people are very aware of the climate and biodiversity crises, with a majority identifying the protection of wildlife and the prevention of climate change as primary reasons to look after nature **[See reference** 78**]**. Providing children and young people with nature and climate positive play spaces fosters a deeper connectedness to the natural world. This is strongly associated with the development of long-term ecological and pro-environmental behaviours **[See reference** 79**]**. A deep connectedness to nature has been found to be a significantly more powerful predictor of pro-environmental actions than environmental knowledge alone **[See reference** 80**]**.

3.26 Weaving nature-based solutions into play spaces helps to mitigate climate change impacts, such as urban heat islands and increased surface-water flooding **[See reference** 81**]**. Trees and vegetation remove airborne pollutants while providing essential cooling effects that protect vulnerable urban populations from extreme heat **[See reference** 82**]**. Designing play spaces with ecological features, such as wildflower meadows and fruit trees, has also been shown to make such spaces significantly more appealing and welcoming for teenage girls **[See reference** 83**]**. Furthermore, higher levels of biodiversity within a park are a key determinant of the psychological and restorative benefits experienced by its users **[See reference** 84**]**.

The need for nature and climate positive play spaces in Broxtowe

3.27 On average, 20-30% of under 16-year olds in the Broxtowe have access to nature close to home (within 300 metres) **[See reference** 85**]**. This is shown in **Figure 3.4a**. However, there are variations across the Borough. In Attenborough & Chilwell East, Beeston Rylands, Chilwell West, and Stapleford South West, only 0-10% of under 16s have access to nature close to home. In Beeston Central, 10-20% have access. While in Toton & Chilwell Meadows, 60-70% have access. In these places, ensuring there are opportunities to connect within play will have an important role in allowing children and young people to connect with nature.

3.28 Climate change is likely to increase periods of extreme heat, which is likely to disproportionately impact Broxtowe's urban areas such as Beeston, Stapleford, Eastwood, and Kimberley **[See reference** 86**]**. Met Office projections indicate that summer rainfall in the East Midlands could decrease by as much as 20% between 2040 and 2059 when compared to the period between 1981 and 2000, increasing the risk of droughts and wildfires **[See reference** 87**]**.

3.29 Conversely, the Borough also faces increased risk of flooding. Flood Zone 3 areas make up 12% of the Borough's total land. Areas of high fluvial flood risk are located along the Rivers Trent and Erewash. Also, there are fluvial flood risks along Gilt Brook and Beauvale Brook, some of which is classified as Flood Zone 2. The Borough also faces increased surface-water flooding, the risk of which is mainly focused on small watercourses and some urban areas. Neighbourhoods vulnerable to a 1 in 30-year surface flooding event include parts of Eastwood, Kimberley, Beeston, Stapleford, Toton, Trowell, and Nottingham's western edge near Cinderhill. Overall, 4% of the Borough's total land area is exposed to a 1 in 100-year flood risk. Eastwood St Mary's and Eastwood Hilltop have a relatively high social vulnerability to flooding **[See reference** 88**]**.

3.30 Additionally, climate change poses a severe threat to local biodiversity. Modelling by Natural England suggests that 502 hectares of habitat within Broxtowe are at the highest risk of damage due to climate change **[See reference** 89**]**. These areas of high-risk are located across the Borough; although, many are within flood zones close to settlements (including Brinsley, Eastwood, Kimberley, and Beeston and Attenborough).

3.31 The vulnerability of biodiversity to climate change and location of Flood Zones 2 and 3 are shown in **Figure 3.4b**.

The nature and climate positive theme was not a subject of much discussion during stakeholder engagement. However, the need for more areas of free play within forests, such as den building, mud kitchens and forest schools was identified.

Figure 3.4a Child access to nature in Broxtowe

Broxtowe borough

Analysis area

Population under 16 probably living within 300m of a greenspace

Highest

Lowest

Figure 3.4b Climate risk in Broxtowe

Broxtowe borough

Analysis area

National Biodiversity Climate Change Vulnerability Assessment

These areas have been assessed as having low sensitivity habitats and high adaptive capacity.

These area could have a greater range of scores, for example, the squares could have been assessed as having medium sensitivity and medium adaptive capacity or potentially low sensitivity but also low adaptive capacity.

These areas have been assessed as having highly sensitive habitats with low adaptive capacity.

Flood Zone 2

Flood Zone 3

0 1.5 3 km

Map scale 1:75,000 @ A3

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Chapter 4
Overview of play provision in Broxtowe

4.1 This chapter provides a summary of the parks and play spaces in Broxtowe being considered as part of this study. In total 56 play spaces have been considered in this study. This includes stand-along play areas, formal and informal play provision within wider open spaces and parks with no designated formal play.

4.2 There are over 600 pieces of play equipment installed and maintained in the Council's play areas. Equipped play meets the BS EN 1176 British and European Standard for playground equipment. Equipment also meets BS EN 1177, which covers playground surfacing and provides guidance on critical fall height and impact safety. These equipped play spaces have been considered in this study, alongside wider parks and informal play areas which provide a range of play affordances for children and young people across Broxtowe.

4.3 Play parks in Broxtowe have been categorised according to the type of play on offer. These categorisations are based on those outlined by Fields in Trust **[See reference** 90**]**. This has primarily been based on the age range catered for (within equipped play areas) and the types of play on offer for informal play. The following definitions have been considered. A single park can include more than one play space within it.

- **Equipped play**: These are formal play areas dedicated for children's play and with equipped play facilities to support this. They may be fenced or unfenced and typically would include signage outlining the area as space for children. They can be split into three groups.
  - **Local Areas for Play (LAPs):** Designated play space for very young children (under 5). Generally they include fewer than five pieces of equipment / play affordances. They would normally have a minimum size of 100 square metres.
  - **Local Equipped Areas for Play (LEAPs):** Equipped play area, generally aimed at 5 to 8 year olds. It would typically include around five types of play equipment. They would normally have a minimum size of 400 square metres, including run around and supplementary areas around the equipped play. Integrated spaces which offer play for 5 to 8 year olds and younger children can still be classified as LEAPs.
  - **Neighbourhood Equipped Areas for Play (NEAPs):** Larger play areas with a variety of equipment suitable for older children playing independently, typically for children 9 years and over. Typically, they may have about eight

types of play activities included and would have a minimum size of 1000 square metres. They may also include play provision for younger children.

- **Designated informal play and youth spaces space**: These are often aimed at older children (11 years or over) and include infrastructure to support more informal play, although usually though a specific activity. This may include:
  - **Larger games areas:** This includes Multi-Use Games Areas (MUGAs) or other ball courts or single basketball hoops, usually with a minimum size of 1,000 square metres.
  - **Other designated informal play space:** This can include wheels park (e.g. skate park or skate ramps), BMX or pump track, green gym or any other open space area designated for children or young people's play.
- **Other informal play elements:** This includes spaces with more playful features (e.g. social seating, teen shelter, logs, boulders, playful topography) which are integrated within a wider open space. An element would usually fall into this category where playful features are spread across the wider greenspace, if features were grouped together to form a 'play zone' then they would be considered as a designated informal play space.
- **Sports provision:** This includes formal sports offer available within the open space (although this may be restricted to members only). This includes tennis, bowls, grass pitches and artificial pitches, as well as promoted walking / jogging routes.
- **Informal open space:** This includes all elements of a greenspace which may offer opportunities for informal kickabout or space to 'hang out' but without any infrastructure or specific design features to encourage this.

4.4 Table 4.1 provides an overview of the play spaces manged by Broxtowe Borough Council and the Parish Councils. This is a count of the number of play or parks sites which include the different types of play provision.

Table 4.1: Types of play within sites owned and managed by Broxtowe Borough Council

Feature present	Space managed by Broxtowe Borough Council	Space managed by parish council
Local Area for Play (LAP)	2	0
Local Equipped Area for Play (LEAP)	11	0

Feature present	Space managed by Broxtowe Borough Council	Space managed by parish council
Neighbourhood Equipped Area for Play (NEAP)	23	8
Informal / youth space	20	7
Sport facilities	26	6
Informal play and kickabout space within wider greenspace	45	10
All parks and play spaces	46	10

4.5 Within this strategy the following additional terminology is used:

- Informal / youth space: This refers to discrete areas of informal play for youth or informal play elements.
- NEAP + youth: This is used for understanding quality and value of sites. It refers to parks or play spaces which include NEAP equipped play and informal / youth spaces.
- Informal wider area: This is used for understanding quality and value of sites. It refers to parks or play spaces only include sports provision, informal kickabout areas or informal play elements which do not qualify as informal / youth spaces.

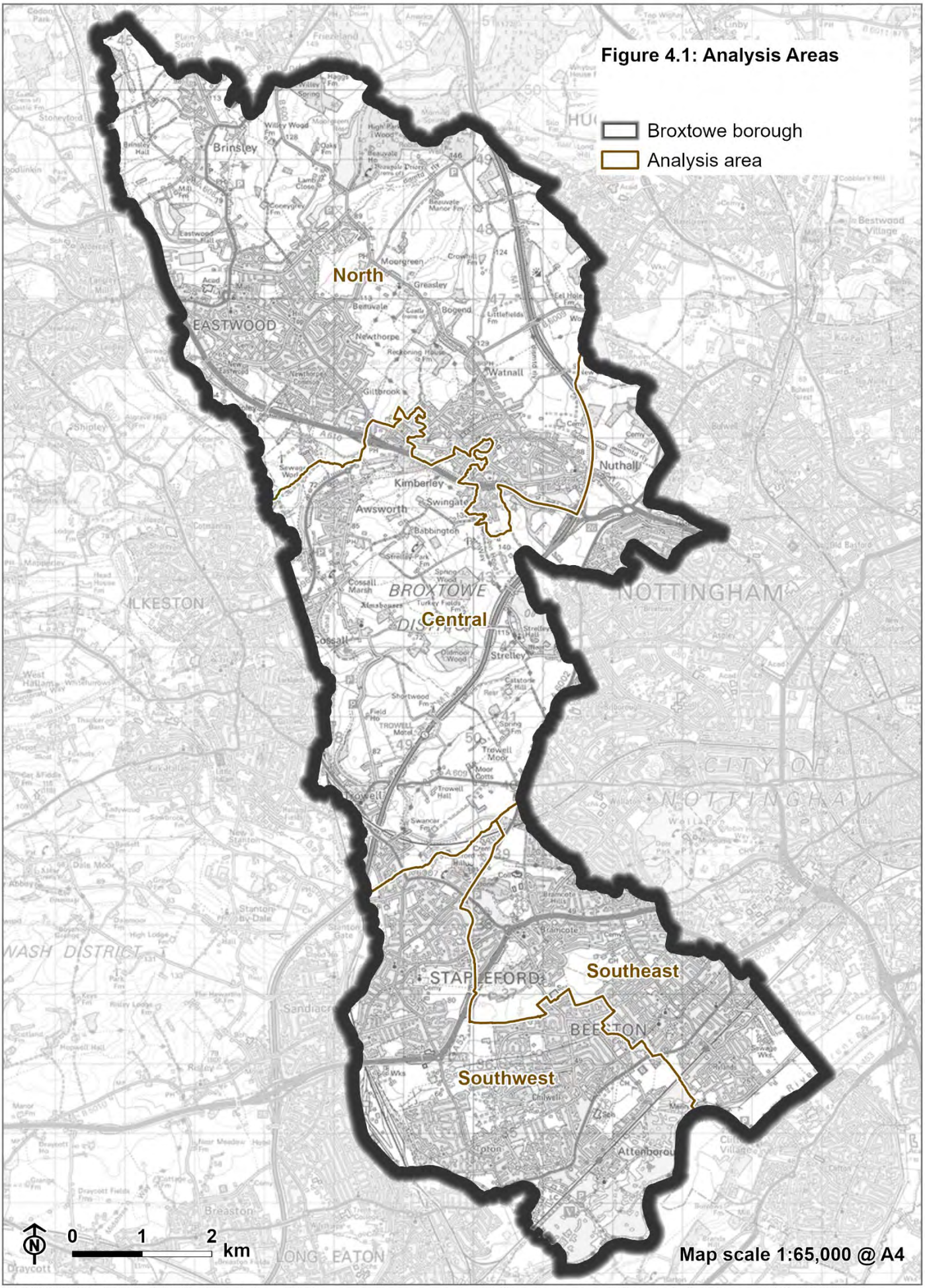
4.6 In order to analyse the provision, the Borough has been split into four analysis areas:

- North: This includes rural areas in the north of the Borough (Brinsley and Greasley), as well as the urban settlements around Eastwood, Kimberley, Nuthall and Watnall.
- Central: This comprises the primarily rural area in the centre of Broxtowe. It includes the settlements of Awsworth, Cossall, Strelley and Trowell. The eastern edge part of the urban edge of Nottingham has extended into this area.
- South-East: This is primarily urban, incorporating Attenborough, Chilwell and Stapleford.
- South-West: This is primarily urban, incorporating Beeston and Bramcote.

4.7 The exact boundaries for these analysis areas have been drawn using Lower Super Output Area (LSOA) boundaries to allow comparison with population and

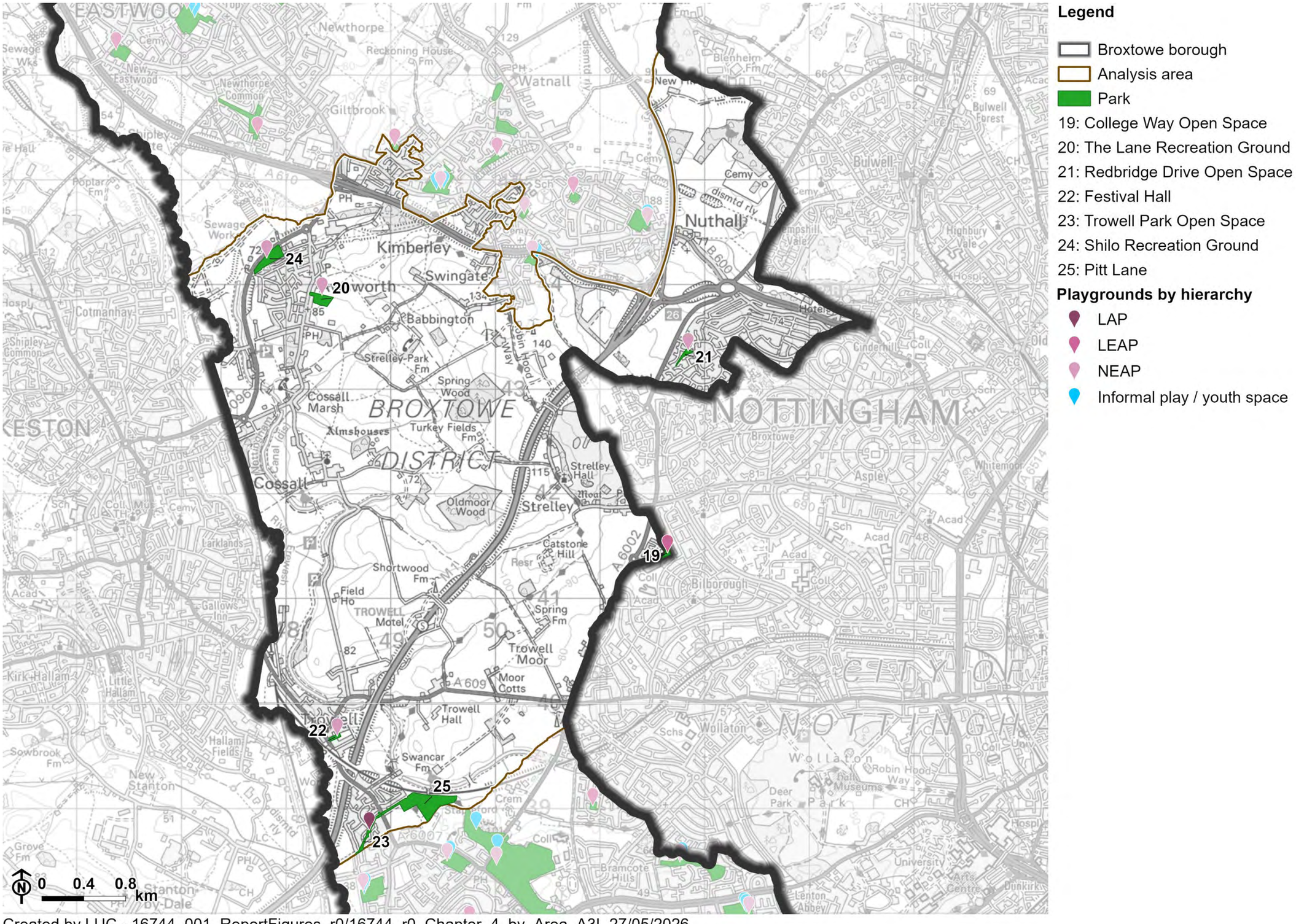
deprivation data which use these units. The location of the analysis areas is shown in **Figure 4.1**.

4.8 The names and locations of the play spaces are shown for each analysis area in **Figures 4.2** to **4.5**.



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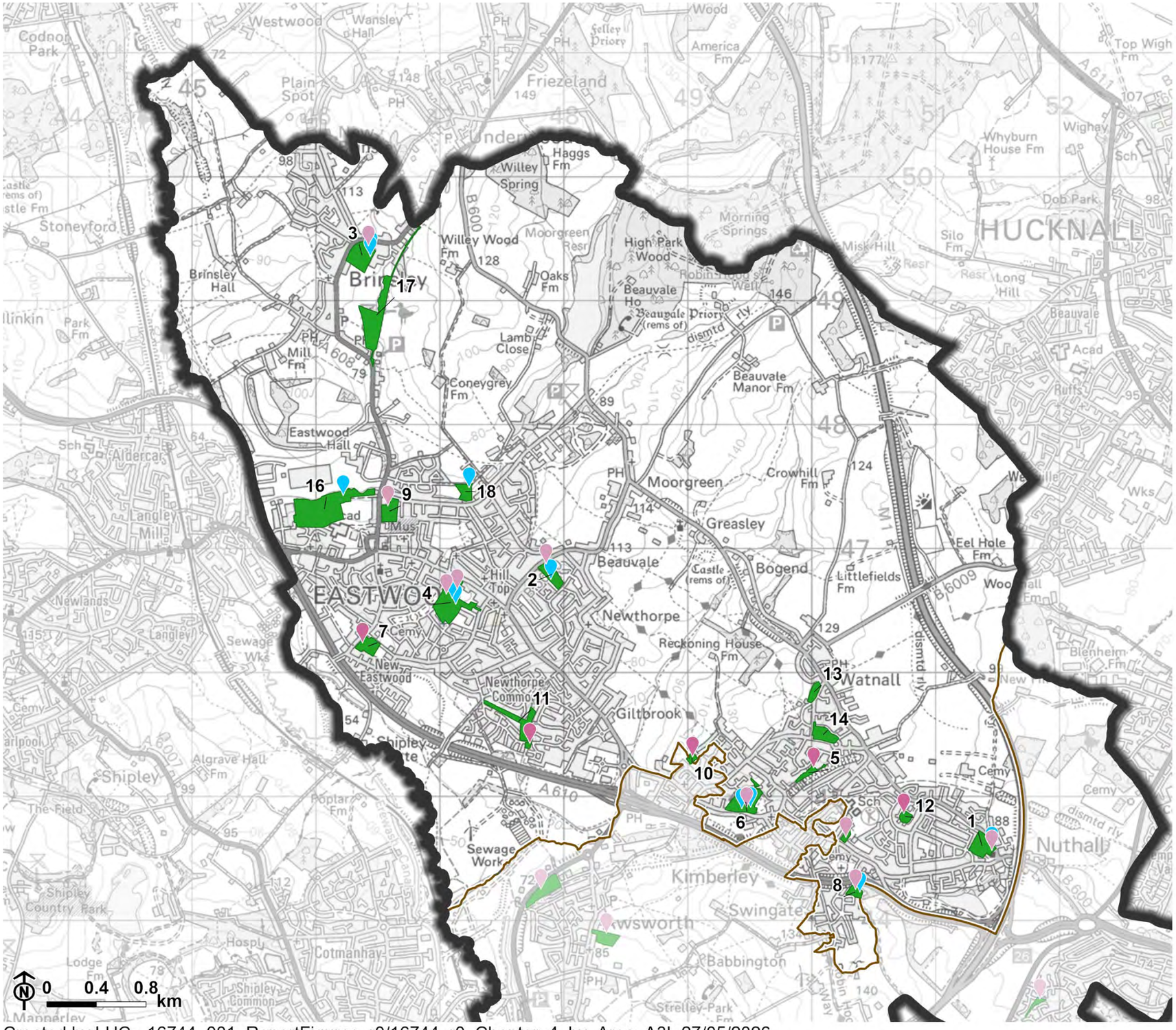
Figure 4.1: Parks and play provision in the central analysis area



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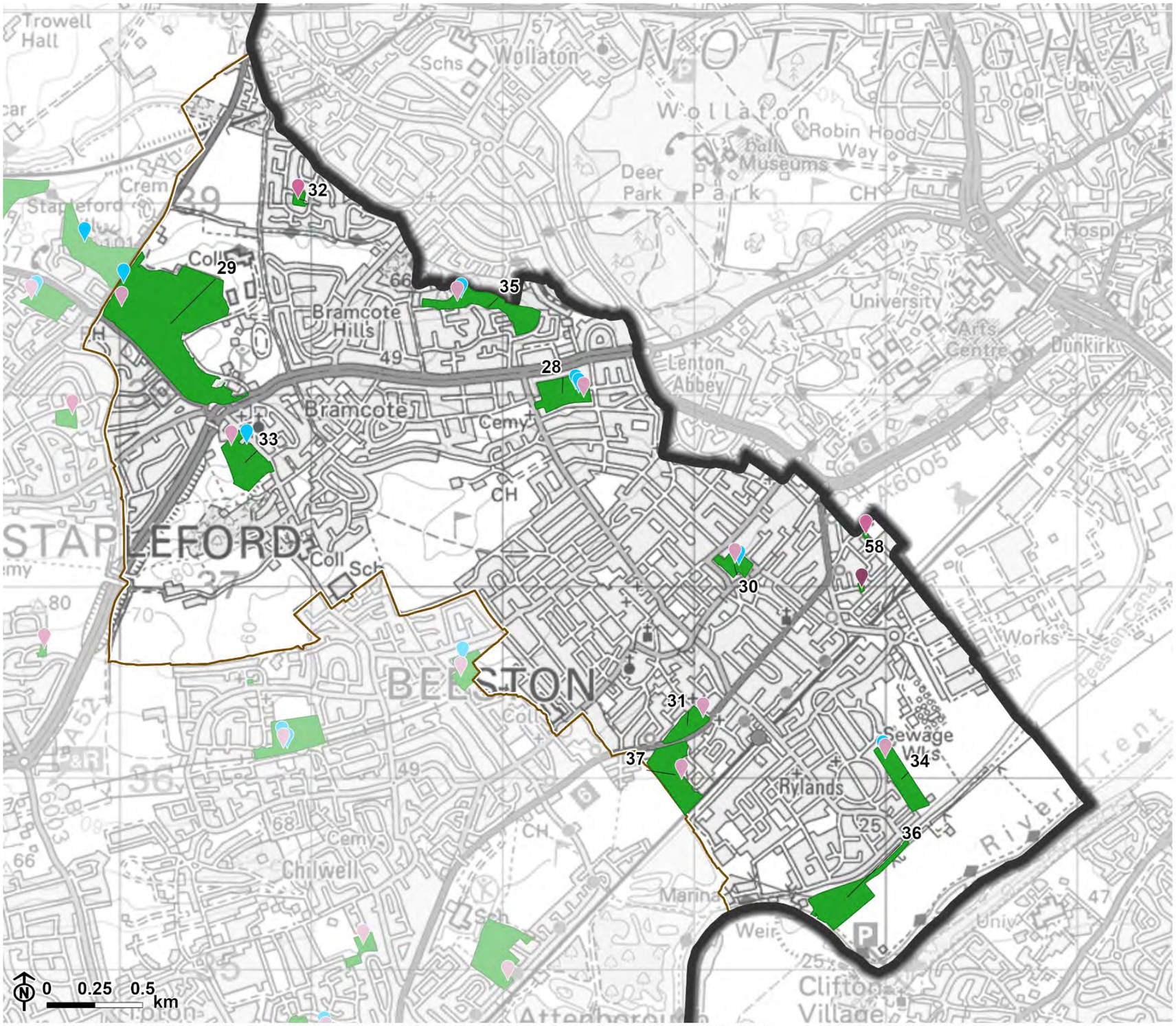
Figure 4.2: Parks and play provision in the north analysis area



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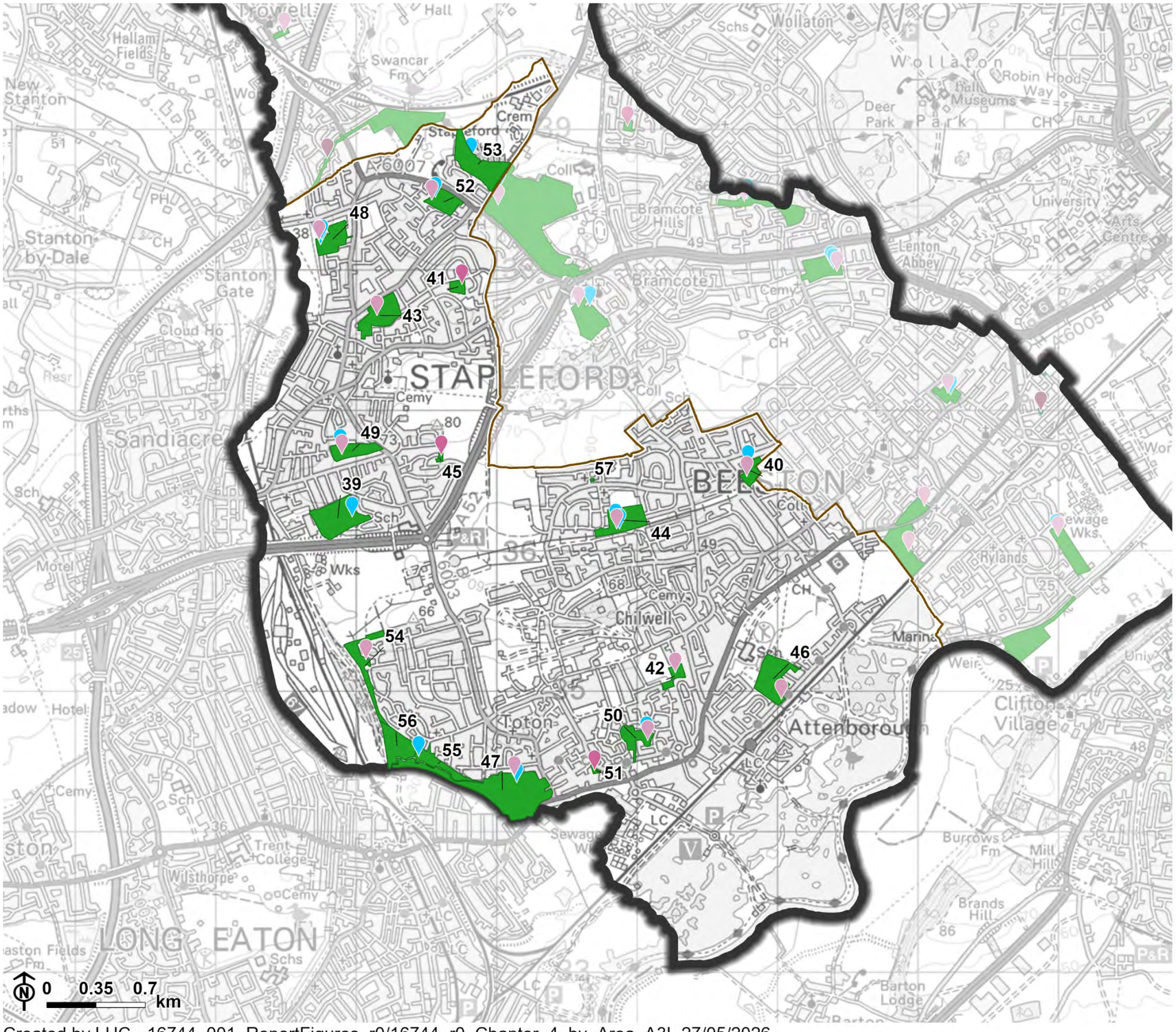
Figure 4.3: Parks and play provision in the southeast analysis area



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Figure 4.4: Parks and play provision in the southwest analysis area



Legend

- Broxtowe borough
- Analysis area
- Park

39: Archers Field MUGA
40: Cator Lane Park and Play Area
41: Central Avenue
42: Chetwynd Road Recreation Ground
43: Hickings Lane Recreation Ground
44: Inham Nook Recreation Ground
45: Judson Avenue Open Space
46: Long Lane Recreation Ground
47: Manor Farm Recreation Ground
48: Pasture Road
49: Queen Elizabeth II Park
50: Sherman Drive Open Space
51: Swiney Way Open Space
52: Ilkeston Road Recreation Ground
53: Hemlockstone (Bike track only)
54: Banks Road Open Space
55: Chester Green Open Space (MUGA)
56: Toton Fields Open Space
57: Barncroft

Playgrounds by hierarchy

- LAP
- LEAP
- NEAP
- Informal play / youth space

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Chapter 5
Quality and value assessment

Quality and value audits

5.1 This Strategy provides an assessment of quality and value of play provision across Broxtowe. The quality and value audit approach considers a range of criteria, providing the opportunity to assess the range of play facilities on offer and their condition.

5.2 Where play provision is located within a wider site, the characteristics of the surrounding site are considered. This approach provides the opportunity to undertake a strategic assessment of play provision across the Borough. It also enables the identification of priority sites for future investment, thereby maximising the benefit that the network can provide for the community.

5.3 Criteria have been defined as relating to quality or value, whereby:

- 'Value' relates to the presence of various features and facilities, value to the community, location and standard of design; and
- 'Quality' covers aspects relating to management and the condition of features and facilities.

5.4 Quality and value are fundamentally different and can be completely unrelated. For example, a play space may be high quality (by virtue of it being well maintained and in good condition), but if it does not have an appropriate level of facilities for the type of site, it may be of low value. Conversely, a play space could have an appropriate level of facilities (high value), but the condition of the site could still fall short (low quality).

5.5 Scoring for most of the criteria in the quality and value assessment is based on a scale of 1 to 5. Quality scores broadly translate as:

- 1 = Very poor
- 2 = Poor
- 3 = Fair
- 4 = Good
- 5 = Very good

5.6 Value scores can be broadly described as 1 = poor / lower value to 5 = higher value. For some criteria a value score of 1 or 2 is added to account for the presence of the feature. In these cases, the corresponding quality score is considered optional, with an 'NA' score being applied if the feature is not present.

5.7 The final quality scores were calculated by summing all the compulsory quality criteria, along with the average form the optional quality scores. The value scores were calculated as a sum of all value scores.

5.8 The survey used in the assessments is provided in **Appendix A**.

Quality and value analysis by theme

Theme 1: Inclusive and community orientated

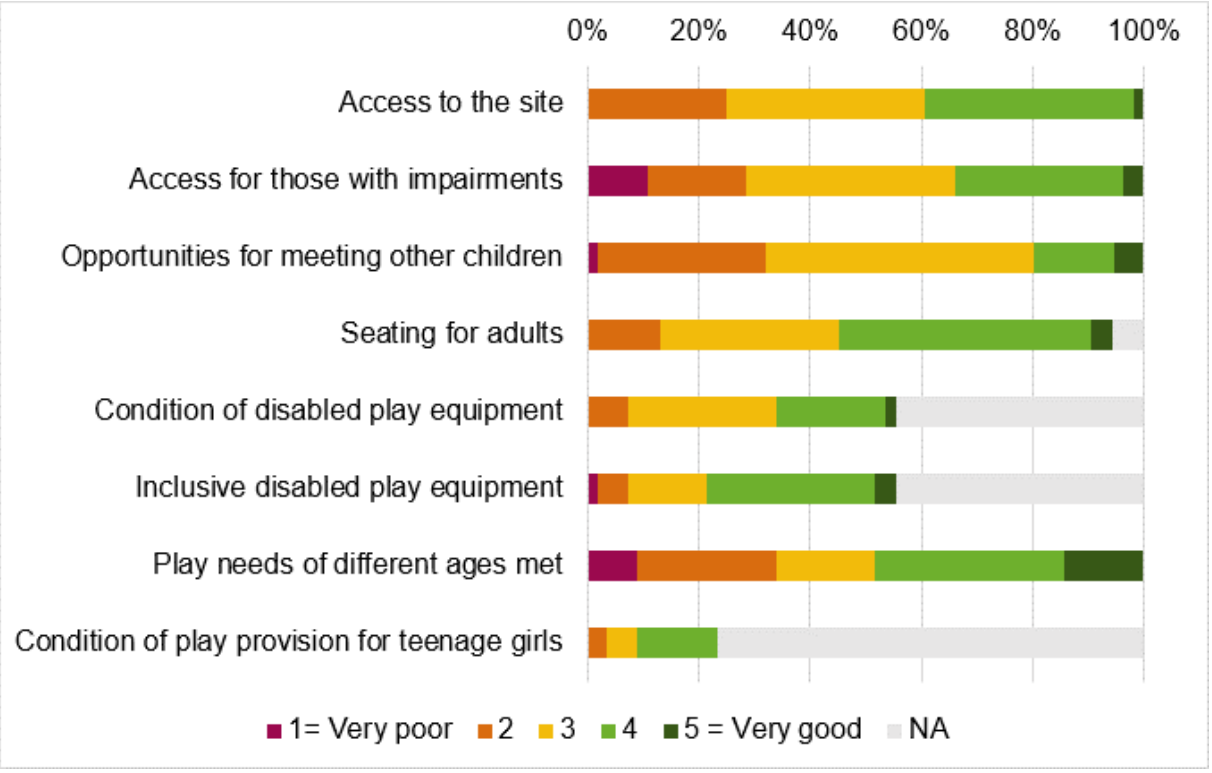
5.9 Indicators for the inclusive and community orientated theme formed sections 2 and 6 of the audit form. Examples of the criteria included comprise:

- Location criteria (e.g. access to the sits and opportunities for meeting other children);
- Provision of facilities for supervisory adults e.g. seating;
- Inclusion of equipment for disabled children, including neurodiversity; and
- Provision for children of all ages, including teenagers (and non-sport-based equipment for teenage girls).

5.10 The spread of results for some of the key criteria are shown in **Figure 5.1**. Not applicable (NA) indicate that the features being scored on its condition is not present within the site.

5.11 Around 40% of audited sites score 4 (Good) or 5 (Very good) in relation to access to the site. The higher scoring sites generally comprised those sites with NEAP and youth provision, which were more centrally located spaces which were well linked to transport routes. Conversely, sites with no formal play provision generally had poor access and were twice as likely to score 2 (Very poor) for this.

Figure 5.1: Overview of the inclusive and community-orientated scores



5.12 Scores for access for those with impairments (including wheelchair users and people with visual impairments) were more varied that overall access. Just under 5% of sites scored 5 (Very Good), which was double the number of sites which scored 5 for overall access. However, there were also more sites that scored poorly, with just over 10% of sites scoring 1 (Very Poor).

5.13 Whilst arrival at the play space was generally scoring 3 (Fair) or higher, access through the space generally scored lower. This criterion was scored 0 – 2 rather than 1-5. Just over 25% of sites audited scored 0, indicating that access throughout the whole site was not suitable for wheelchair and pushchair users.

5.14 The vast majority of sites visited included seating for adults, and this was generally in a good or very condition (scores of 4 and 5). In some spaces there was provision for picnic tables which incorporated a space for wheelchair users. However, there were fewer examples of sites which included seating specifically for children or teenagers and young people. Around 15% of sites included seating designed for children and 15% included seating for teenagers, such as a teen shelter. In some examples.

5.15 Equipment provision for children with disabilities was present in just over half of the sites visited, but around 45% of sites visited did not have any equipment suitable for disabled users. The most common types of equipment recorded were buddy /

basket swings and infinity bowl roundabouts. In some cases, these were located within areas of bark, which may reduce the usability of the equipment for disabled users.

5.16 The availability of play equipment for disabled children includes inclusive equipment, that can be used by children of all abilities, and exclusive equipment, which is tailored for use only by wheelchair users. There is a priority in Broxtowe to focus on inclusive equipment which allows all children to play together. Over 60% of the play spaces with disabled play equipment scored 4 (Good) or 5 (Very good) for ensuring inclusivity within disabled play equipment.

5.17 Overall, the majority of spaces did not include features which may support teenage girls. Less than 25% of sites included features which promote use for teenagers girls. Of these, only one site scored 2 for valuing, indicating that there was more notable provision for teenage girls. In all other cases the sites scored 1, representing a limited provision. This may include social seating, but which is not specifically aimed at teenage girls.

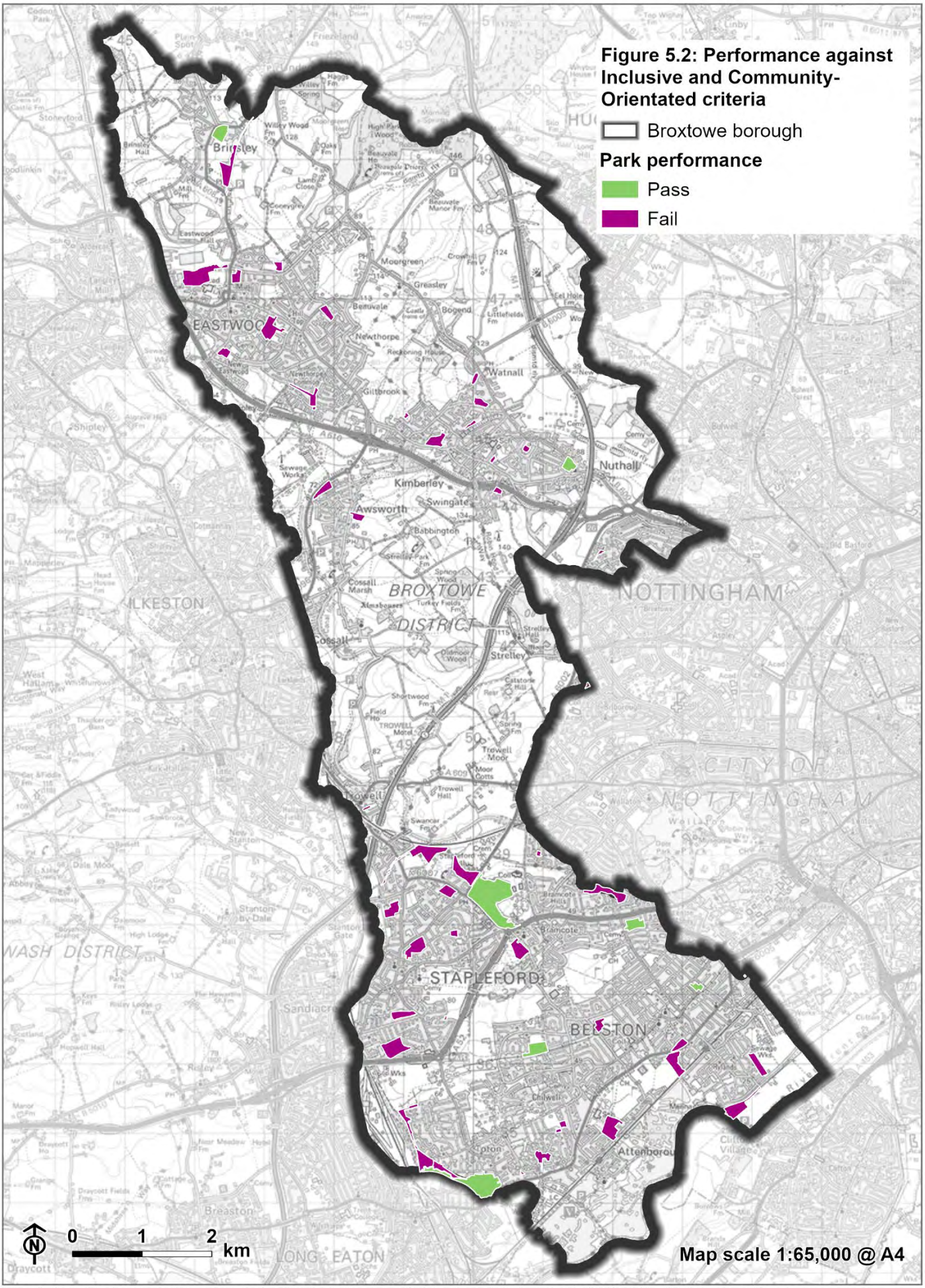
5.18 Based on the analysis of the scores, a benchmark score of 50 was applied to indicate excellent performance for the inclusive and community-orientated theme. Broadly this was applicable to having equipment and access for disabled users, as well as catering to a range of ages.

5.19 Figure 5.2 below shows which sites meet these criteria. Seven of the 56 sites met this benchmark. All of the sites which meet this benchmark include NEAP and youth provision.

Theme 2: Active and healthy

5.20 Indicators for the inclusive and community orientated theme formed sections 3, 4 and 5 of the audit form. Examples of the criteria included comprise:

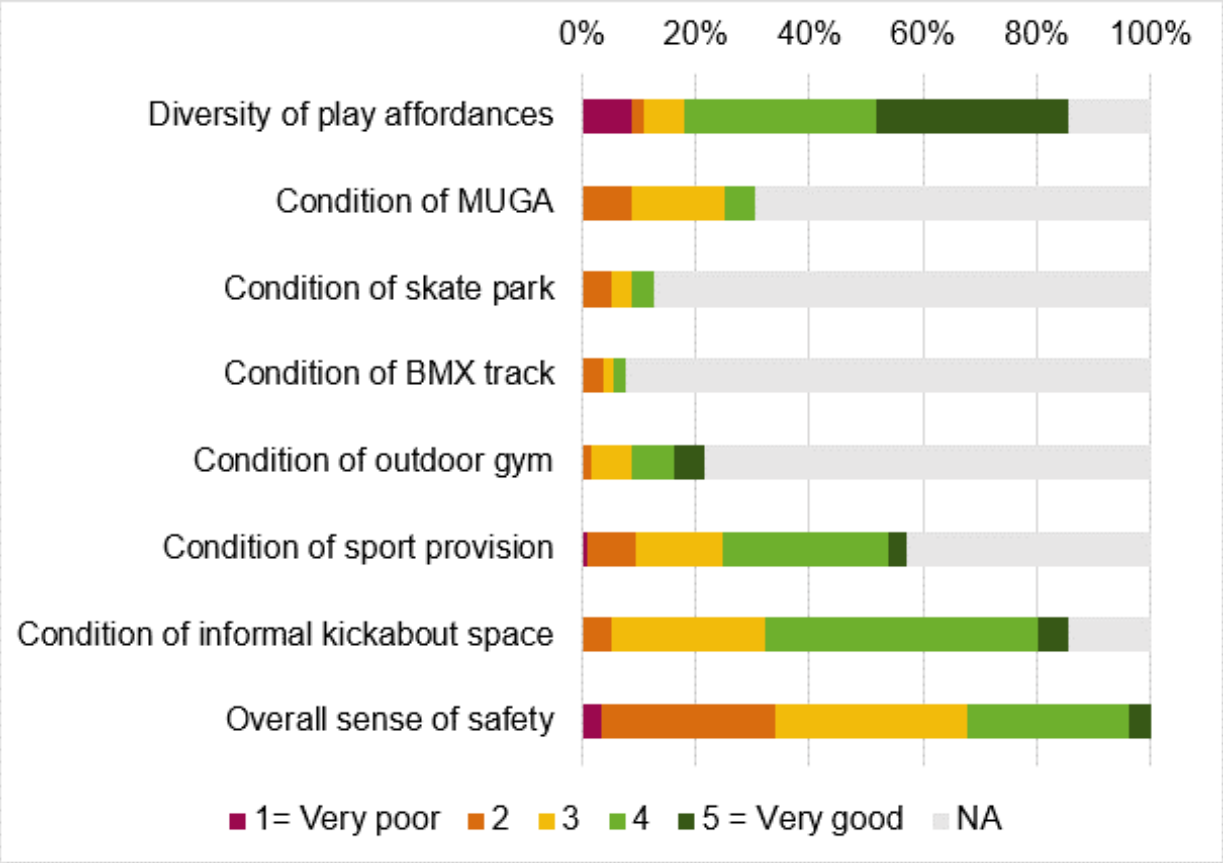
- Types of play affordances available (e.g. climbing, swinging, balancing, rotating, jumping etc.);
- Provision and condition of different types of physical activity-based youth spaces such as skate parks, basketball hoops and Multi-Use Games Areas (MUGAs);
- Provision and condition of different sport, offerings including grass pitches, artificial pitches and tennis courts; and
- Health and safety elements.



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5.21 The spread of results for some of the key criteria are shown in **Figure 5.3**. Not applicable (NA) indicates the features being scored on its condition is not present within the site.

Figure 5.3: Overview of active and healthy scores



5.22 Equipped play areas generally offered a variety of play affordances, with around a third offering 8 or 9 of the 12 play affordances (Score 4 – Good) and around a third offering 10 or more play affordances (Score 5 – Very good). All sites with a NEAP equipped play had at least 8 play affordances on offer.

5.23 The majority of spaces did not include youth spaces which offered physical activity for older children. The most common provision for this was Multi-Use Games Areas (MUGAs). This was recorded in just over 30% of sites. Many of these were smaller than the standard MUGA, offering a single basketball post on one in the centre of the MUGA and a single goal post on the reverse. Outdoor gym equipment, offering physical activity for older children and adults were recorded in just over 20% of sites. Generally this type of provision was of higher quality than other youth provision.

5.24 Around 55% of sites included some form of sports provision. The most common sports provision was grass football pitches, which were present in around 42% sites. Erosion under goal posts was noted and, in many cases, contributed to lower condition scores.

5.25 The majority of spaces included space for informal kickabout, offering space for informal physical activity. Where this was present, the majority of informal kickabout areas scored 4 (Good) or 5 (Very good). This indicates these spaces are generally flat, of an appropriate size and the grass coverage is well maintained.

5.26 A third of sites scored 4 (Good) or 5 (Very good) for the overall sense of safety. However, there was a notable number of sites (30%) that scores 2 (Poor). This included many of the more natural spaces, including woodland which restricts sightlines in and out of the space.

5.27 Overall, the majority of sites included safety signage including with an emergency contact and reinforcing that dogs should not be within play spaces. No smoking signs were generally not included for signs in Broxtowe.

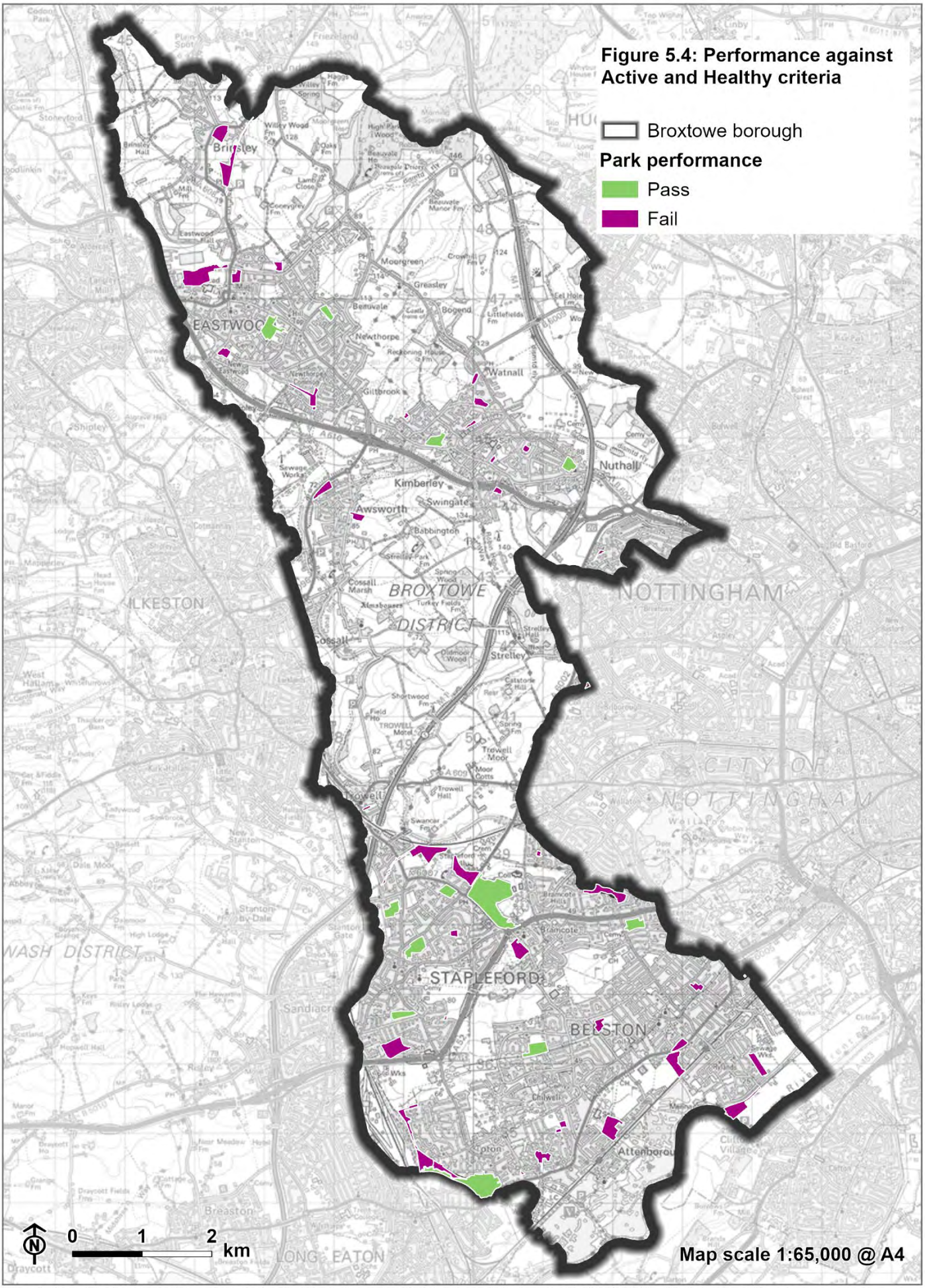
5.28 Based on the analysis of the scores, a benchmark score of 36 was applied to indicate excellent performance for the active and healthy theme. Broadly this was applicable to having a good variety of active play and sport provision for differing ages, as well as being a safe space to play.

5.29 Figure 5.4 shows the spread of scores for the inclusive and community-oriented theme. Twelve of the 56 sites met this benchmark. All twelve of these were spaces with NEAP and youth provision.

Theme 3: Supporting well-being and development

5.30 Indicators for the inclusive and community orientated theme formed section 7 of the audit form. Examples of the criteria included comprise:

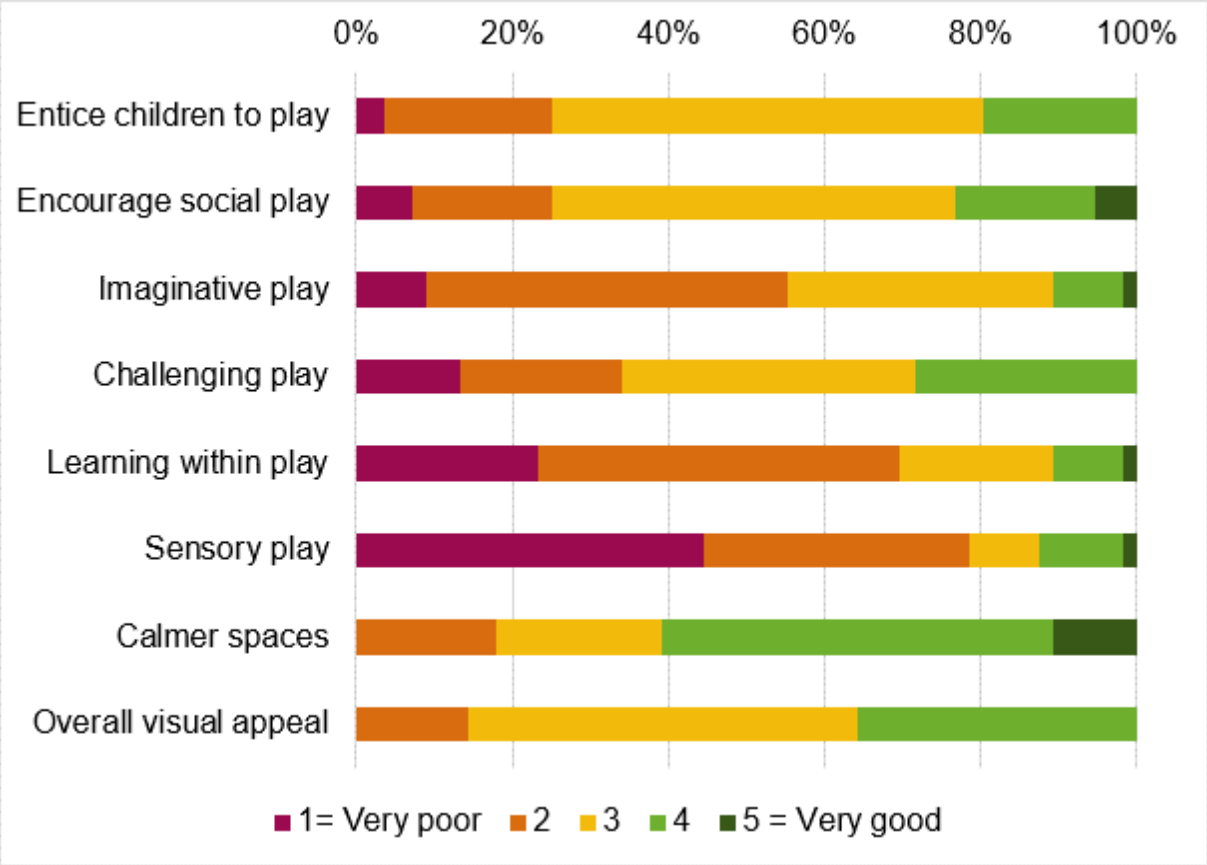
- Spaces which entice children to play, including through welcoming and encouraging signage, visual interest and incorporating calmer as well as busier spaces.
- Additional play value, encouraging social and imaginative play for all children.
- Play spaces which are designed to maximise and support learning within play.
- Inclusion of sensory play such as sand, water and musical play.



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5.31 The spread of results for some of the key criteria are shown in **Figure 5.5**.

Figure 5.5: Overview of supporting well-being and development scores



5.32 Scores for the supporting well-being and development theme were lower than scores for other themes. More sites received a score of 1 (Very poor) for criteria within this theme.

5.33 Most signage for play spaces in Broxtowe is informative and rules based. However, few play spaces included more imaginative signage encouraging play for all and enticing children to play. No play spaces in Broxtowe scored 5 (Very good) for this criterion and only 20%scored 4 (Good).

5.34 Overall, most of the equipped play spaces in Broxtowe included standard equipment. Whilst this equipment was in generally good condition, there were fewer examples of added play value, supporting social, imaginative, challenging or educational play. The majority of spaces scored either 3 (Fair) or 2 (Poor) for these criteria.

5.35 Sensory was scored as a separate category, but can also support social, imaginative and educational play and be accessible for a range of users. Overall,

there was limited sensory play within Broxtowe, with 45% of sites scoring 1 (Very poor) for this. Sensory play included sounding items, such as musical equipment, and sand play stations.

5.36 Sites generally scored better for having calm spaces and offering visual appear combined to other criteria within the supporting well-being and development theme. However, for overall visual appeal, the most common score was 3 (Fair) and no spaces scored 5 (Very good).

5.37 Based on the analysis of the scores, a benchmark score of 28 was applied to indicate good performance for the supporting well-being and development. Broadly this was applicable to having elements which support a number of additional play needs, such as supporting imaginative, social, challenging or educational play. As overall performance against this theme was lower in Broxtowe, even sites which scored above this benchmark could include enhancements against this theme.

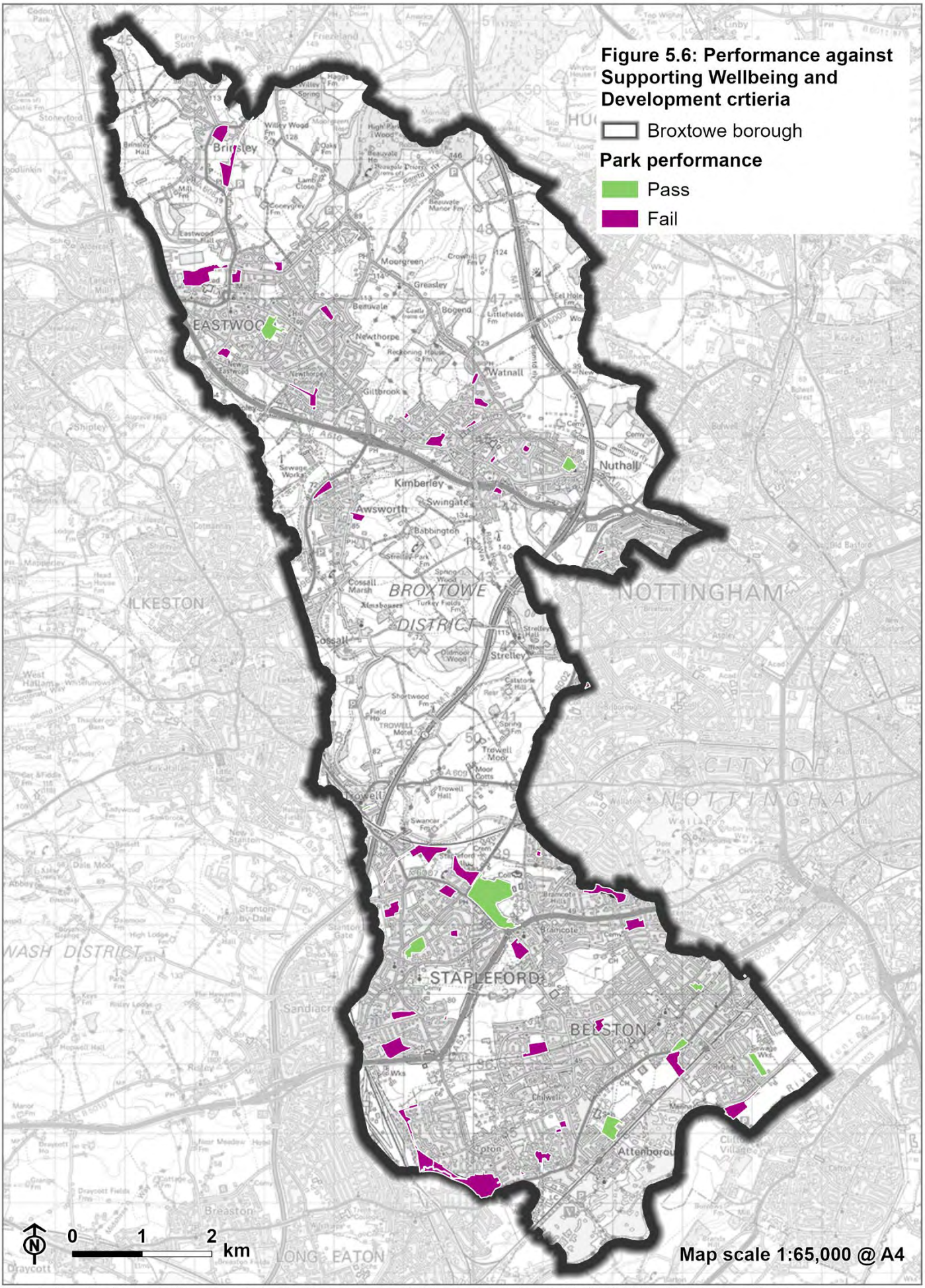
5.38 Figure 5.6 below shows which sites meet this benchmark.

5.39 Nine of the 56 sites met the supporting learning and development benchmark. All of these were spaces with NEAP provision and seven of these also had youth provision.

Theme 4: Nature and climate positive

5.40 Indicators for the inclusive and community orientated theme formed section 8 of the audit form. Examples of the criteria included comprise:

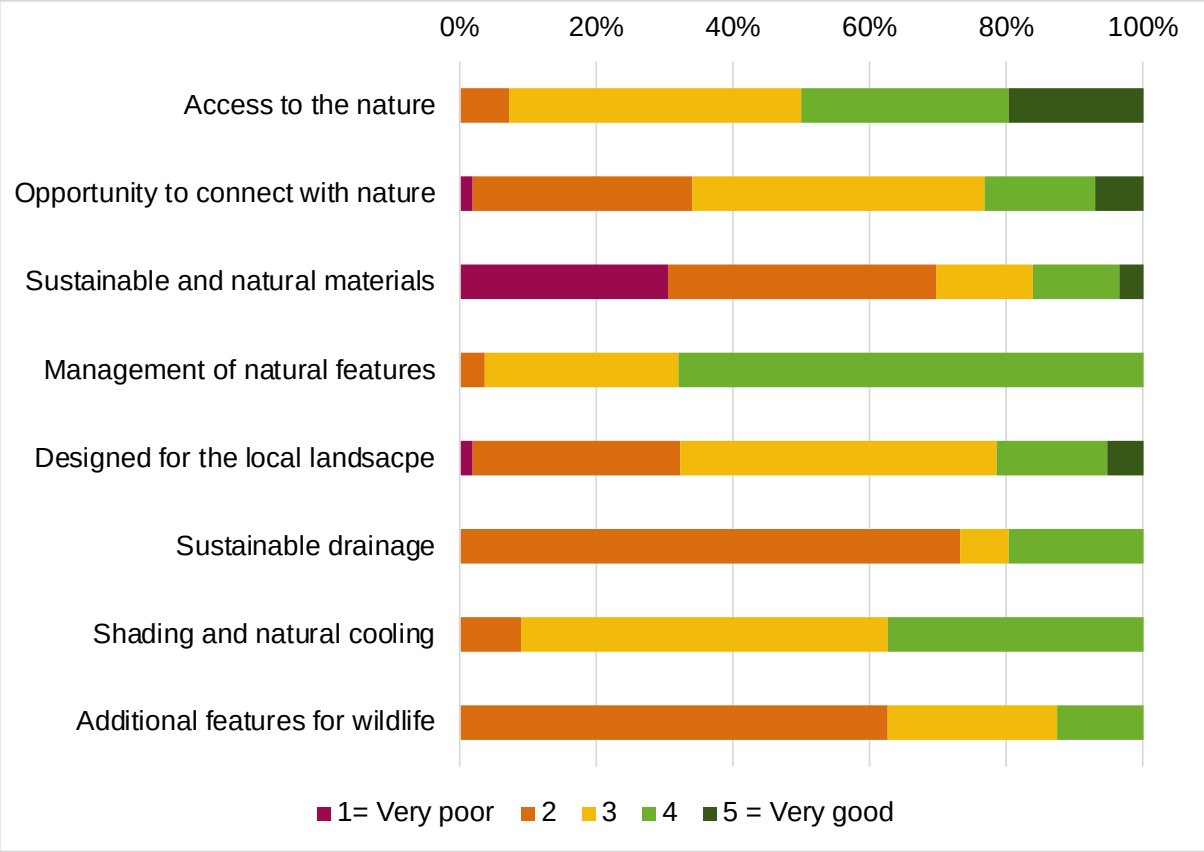
- Access and connection to the natural environment;
- Use of sustainable and natural materials within play equipment and safety surfaces;
- Spaces which are designed for the local landscape;
- Inclusion of Nature-based Solutions, such as water storage and cooling; and
- Provision of habitats and support for wildlife.



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5.41 The spread of results for some of the key criteria are shown in **Figure 5.7**.

Figure 5.7: Overview of nature and climate-postitive scores



5.42 Generally sites provided access to the natural environment. 50% of sites scored 4 (Good) or 5 (Very good) for this criterion and only 7% (4 sites) scored below 3 (Fair). However, scores for offering opportunities to connect with nature were generally lower. For this criterion only 23% of sites scored 4 or 5 and 34% scored less than 3. Generally, sites without formal play equipment had better access and connection to nature.

5.43 The sustainable and natural equipment and surfaces question focussed mostly on timber equipment and bark chippings. Some sites in Broxtowe have safety surfacing composed of recycled material although this was not readily identifiable during the site visit. Most sites include some examples of natural materials within equipment or surfacing (score of 2 (Poor) or higher). However, only 14% had both natural equipment and natural surfacing.

5.44 Natural features were generally well managed, with 72% of spaces scoring 4 (Good) for this. In some cases, poorer management included areas of worn grass around play area fencing or around MUGAs. Some spaces included locked areas of

natural vegetation which were not being well managed, and in cases impacting the overall appeal of the site.

5.45 Scores were generally poorer in terms of sites being designed for the local site. Only 21%% scored 4 (Good) or scored 5 (Very good). In most cases, equipped play areas were bordered by a metal fenced and not integrated into the natural topography of open spaces. This was particularly incongruous in more natural and woodland spaces such as Sandy Lane Nature Reserve.

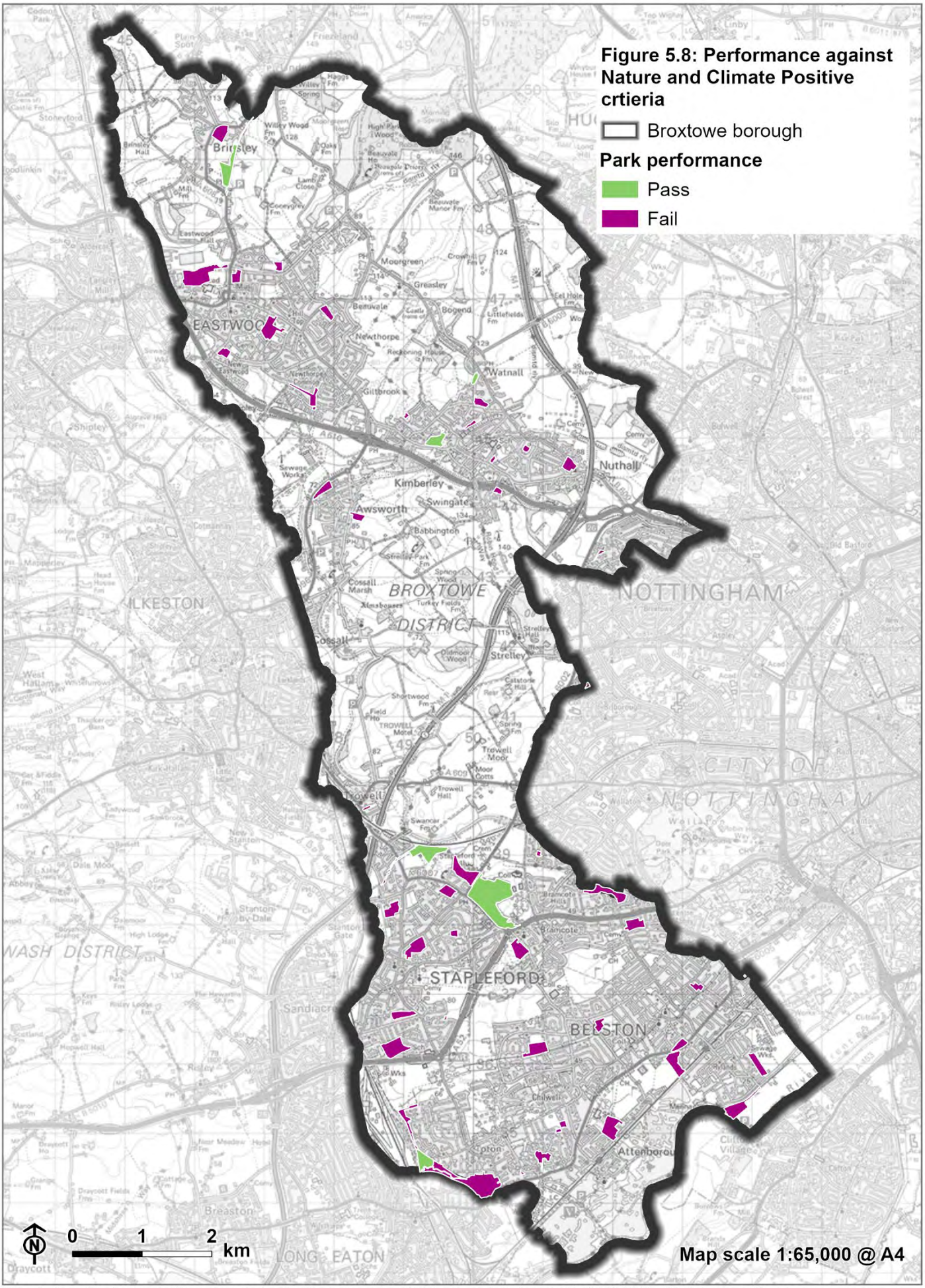
5.46 The final criteria in **Figure 5.7** relate to provision of nature-based solutions creating resilience to climate change and supporting wildlife. These were scored on a scale of 0-2 which have been transformed to scores of 2 – 4 to allow comparison with scores on the scale of 1-5. Overall shading was the most common resilience feature provided on sites, with trees present in most of the spaces. Sustainable drainage features on site mostly included areas of wetland or where parks acted as natural floodplains when located alongside the river (e.g. Weir Fields), rather than the presence of designed SuDS features integrated within spaces.

5.47 Based on the analysis of the scores, a benchmark score of 30 was applied to indicate excellent performance for the nature and climate positive theme. Broadly this was applicable to having some natural features integrated within play, appropriate features which offer some kind of natural play and good management of nature.

5.48 Figure 5.8 shows the performance of sites against this benchmark. Six of the 56 sites met the supporting learning and development benchmark. Four of these were wider informal play areas only and two of these were spaces with NEAP + youth provision.

Developing Quality and Value ‘Benchmark’ Standards

5.49 The purpose of undertaking the site audits is to provide a strategic assessment of the quality and value of sites and gain an understanding of deficiencies in access to high quality / value sites. The scores can then be used as part of a quality and value benchmarking process. The performance of play spaces can be tested against the benchmark scores; highlighting where they sit in relation to an agreed standard that represents what should be considered a good quality / high value site. This process can help to identify current needs for improvement and prioritise investment and enhancement in a strategic way.



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5.50 Separate benchmark scores are proposed for each play typology. This reflects the differing performances of different types of play sites – with large and better equipped neighbourhood sites expected to perform better than smaller doorstep sites. A separate benchmark value is proposed for the 'informal' typology, which includes standalone facilities such as Multi-Use Games Areas (MUGAs), BMX tracks, teen shelters, and skate parks. Again, this reflects differences in the overall scores of such sites which are relatively unequipped compared to other typologies.

5.51 Development of the proposed quality and value standards are based on the calculation of the mean averages of the results of the play space audits. The proposed standards are shown in **Table 5.1**.

Table 5.1: Play space quality and value standards

Play typology	Quality standard	Value standard
Informal wider area	20.5	45
LAP	21	55
LEAP	22	64
NEAP	22	77
NEAP + youth	23	85
Youth	21	58

5.52 The scores take account of what can reasonably be expected from a play space within the area, and the levels of maintenance that should be expected for the type of facilities and features present.

Application of quality and value standards

5.53 Once the sites are tested against the benchmarks, they are assessed against an agreed standard for quality and value. Sites are then identified as falling into one of the four categories, shown below:

- Higher quality, higher value (++)
- Higher quality, lower value (+-)
- Lower quality, higher value (-+)
- Lower quality, lower value (--).

5.54 The categories can provide a broad indication of the type of management approach that may be needed across any given area or site (summarised below).

Higher quality / Higher value (++)

5.55 These sites represent the best play spaces within the borough, offering the greatest value to local communities. Future management should seek to maintain the standards to ensure sites continue to meet the needs of the communities they serve.

5.56 These sites would likely not be considered a priority in terms of future enhancement, however, improvements and enhancement to these sites may still be appropriate in a changing context. Ongoing management of the spaces to maintain the quality and value standards is important.

High Quality / Lower Value (+-)

5.57 The audit found these sites to be achieving a sufficient standard for quality, most likely with sufficient levels of maintenance. Features and facilities are likely to be in good condition, or a good state of repair. Value for these sites fall short of what should be expected. For instance, through a lack of suitable features, facilities, and opportunities for informal recreation.

5.58 These sites should be prioritised for future works to enhance the sites value, for instance through the provision of appropriate features and facilities and implementing appropriate design interventions.

Lower Quality / Higher Value (-+)

5.59 These spaces meet or exceed the proposed standard for value but fall short on the proposed quality standard. These sites will most likely contain the features and attributes that is expected of a play space, but their condition may be poor, and the site may be failing to achieve the expected standards of management and maintenance. Play features may be tired, broken, or beyond their useful life.

5.60 These sites provide most opportunity for ‘quick wins’ of improving play provision through enhanced management and maintenance and repair of equipment. A lack of good management and maintenance can also impact perceptions of safety; therefore, work should also be undertaken to ensure play spaces are welcoming and feel safe for use by the local community.

Lower Quality / Lower Value (--)

5.61 Enhancing both the quality and value of these sites should be considered a priority, particularly in areas which suffer from a deficiency in access to, or quantity of, publicly accessible play space.

Summary of results

5.62 An overview of the number of Broxtowe play spaces, per typology, that fall under each quality / value performance standard is provided in **Table 5.2** below.

Table 5.2: Overview of quality / value performance across typologies

Typology	Higher quality and value (++)	Higher quality, lower value (+-)	Lower quality, higher value (-+)	Lower quality, lower value (--)
Informal wider area	3	2	2	0
LAP	1	1	0	0
LEAP	3	3	3	2
NEAP	4	1	1	3
NEAP + youth	5	6	7	4
Youth	1	2	2	0
Total	**17**	**15**	**15**	**9**

5.63 In Broxtowe, 30% of play areas are higher quality and higher value (++), meaning they offer the greatest value to local communities and are maintained to a high standard. These play spaces represent the play spaces that are performing well for their size and type. Overall, informal NEAPs and LAPs were more likely to score in ++ category (although the very small low number of LAPs audited reduces the applicability of this conclusion overall).

5.64 Approximately 27% of Broxtowe play spaces fall within the higher quality and lower value (+-) category. This means they are managed and maintained to a high standard, but may be limited in what they offer or how they are designed for community needs. Another 27% of Broxtowe play spaces are lower quality and higher value (-+). This means that they meet or exceed the value standard in terms of their features and facilities, value to the community, location and standard of design. However, these sites fall short on quality, namely aspects relating to management

and the condition of features and facilities. The split between +- and -+ sites is relatively consistent across all play typologies. The exception is for LAPs where no sites scored -+. The caveat relating to the limited number of LAP sites still applies.

5.65 In Broxtowe, approximately 16% of play spaces are lower quality / lower value, meaning that they lack the presence of various features and facilities, value to the community, location and standard of design and also do not meet the standards relating to management and the condition of features and facilities. All sites which fall in this category are LEAP, NEAP or NEAP + youth spaces. In particular there is a higher proportion of NEAPs which fall into this category compared to other play typologies.

Spatial distribution of quality and value scores

5.66 A colour coding system has been applied as part of strategic mapping exercises to understand any spatial patterns of the performance of sites and to identify priority areas for enhancement.

Table 5.3: Symbology for quality and value performance

Symbol and colour coding	Description
+/+	Higher quality / higher value
+/-	Higher quality / lower value
-/+	Lower quality / higher value
-/-	Lower quality / lower value

5.67 The pattern of differing sites scores across the Analysis Areas is shown in **Table 5.4.** The spatial pattern of these scores is also shown in **Figures 5.5.** This figure provides a detailed overview of the performance of play provision against the benchmark standard.

Table 5.4: Quality and value of parks and play spaces in Broxtowe by analysis area

Analysis Area	Higher quality and value (++)	Higher quality, lower value (+-)	Lower quality, higher value (-+)	Lower quality, lower value (--)
Central	2	3	0	2
North	3	6	7	2
Southeast	7	2	1	2
Southwest	5	4	7	3
Broxtowe (total)	**17**	**15**	**15**	**9**

Central analysis area

5.68 There is a strong spatial pattern associated with the distribution of scores within the central analysis area.

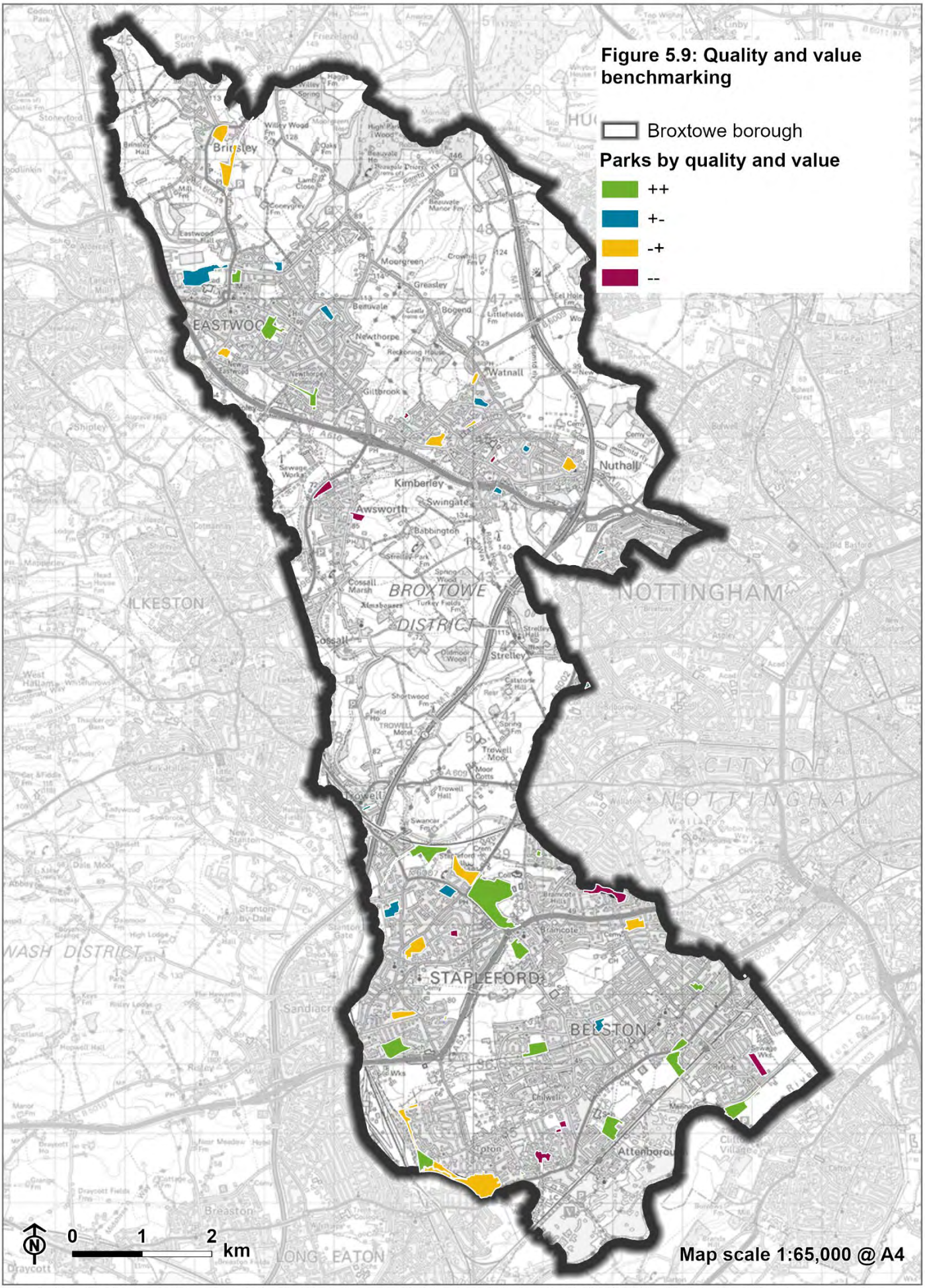
5.69 Two of the seven play spaces in the central area are within the ++ category. These are both located in the south of the analysis area around Trowell. Additionally, this includes an informal play space and LAP. Of the play typologies with more dedicated play provision for a range of ages, no spaces score ++ within this analysis area.

5.70 In the northeast, around Awsworth, the two play spaces both scored --. This included a NEAP and NEAP + youth space. Additionally, three sites scored +-. One of these is also located in the south, around Trowell. The remaining two are located in the east of the analysis area, within the urban edge of Nottingham.

North analysis area

5.71 The north analysis area had the smallest proportion of sites which scored ++. Only 3 of the 18 sites received this score. Those that did score well are located around the urban area of Eastwood and Giltbrook.

5.72 Other settlements within this analysis area do not include high quality and value sites. Both sites in Brinsley scored-+. Around the urban areas of Kimberley, Watnall and Nuthall four sites scored -+, three +- and two --.



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Southeast analysis area

5.73 The southeast analysis area has the highest proportion of ++ parks and play spaces. Seven of the 12 parks and play spaces in the southeast are within this category. This analysis area includes Bramcote Hills Park, which scores the highest for both quality and value totals, and is the only site to reach the 'pass' benchmark for all four of the themes.

5.74 The remaining spaces include two +- sites, one -+ site and 2 – sites. These are located along the eastern edge of the analysis area. The three sites that do not mee the value standard are all spaces with NEAP + youth provision, which should provide dedicated play space for the children of all ages.

Southwest analysis area

5.75 Along with the north, the southwest analysis area had the highest share of -+ sites, which made up seven of the 19 sites in this area. Sites which received this score included several larger sites, including Manor Farm Recreation Ground, Banks Road Open Space and Hickings Lane Recreation Ground.

5.76 Five sites scored ++, this included a range of play typologies. Although these were mostly located in the south of the analysis area, highly scoring sites such as Bramcote Hills park and Pitt Lane Recreation are adjacent to the southwest analysis area in the north.

5.77 Additionally, four sites scored +- and three scored --. More than half of the sites which scored within this lower value were NEAP + youth sites, which are the sites which included dedicated play provision for the widest range of ages.

Chapter 6
Quantity and accessibility assessment

Quantity overview

Approach

6.1 Quantity analysis compares the amount (in hectares) of play provision compared to the population. Calculation have been made using the 2024 mid-year estimate of population for Broxtowe produced by the Office for National Statistics. Three different scenarios have been considered:

- Calculations using the whole area of the parks and play spaces compared to the whole population;
- Calculations using the just the areas with equipped play compared to the whole population and the population under 18; and
- Calculation using just areas identified as designated informal play and youth space compared to the whole population and the population under 18.

6.2 These calculations give an idea of the quantity of play provision within Broxtowe. This study has not included a review of other play spaces which may be available in Broxtowe but owned and managed privately.

6.3 Quantities have been provided per analysis area. Six parks were located crossing the boundary of analysis areas these have been counted within the analysis area where the majority of the site falls. In all cases, no more than 0.1 hectares was located within another analysis area.

6.4 The number of sites for equipped play and informal or youth space is different here to the provision listed in Chapter 4. This is because where there are two or more distinct equipped play or youth spaces in different parts of the site these have been calculated separately.

Existing quantity of parks and play

All play and informal parks

6.5 Fields in Trust recommends a provision of 0.8 hectares of parks and gardens per 1,000 people. Across Broxtowe, the Council and parish councils manage 1.67 hectares of parks for every 1,000 people. Whilst this is more than double the Fields in Trust Standard, the parks and play spaces contributing to this include some spaces that within the Fields in Trust model may be categorised under the natural and semi-natural greenspace or amenity greenspace category. Therefore, exceeding this standard does not mean there are excess parks which could be removed.

6.6 These results are shown in **Table 6.1**.

Table 6.1: Quantity of parks in Broxtowe by analysis area

Area	Number of sites	Total area (hectares - ha)	Area (in ha) per 1,000 population
Central	7	13.68	1.12
North	18	49.20	1.57
Southeast	11	57.86	1.84
Southwest	20	70.36	1.78
Broxtowe (total)	**56**	**191.10**	**1.67**

6.7 Overall, the provision of parks is higher in the south, with the Southeast and Southwest analysis areas providing a higher per population quantity of parks. The smallest provision is in the central area, which is mostly rural. Even accounting for the lower population however, there is still a lower quantity per 1,000 people. The central analysis area has just 1.12 hectares of park and play space for every 1,000 people, compared to 1.84 hectares for every 1,000 people in the southeast analysis area.

Equipped play provision

6.8 Fields in Trust recommend a provision of 0.25 hectares of equipped play space for every 1,000 people. In Broxtowe, there is a provision of 0.03 hectares per 1,000 people. This is around 10 times less than the recommended provision. Given this low provision, and in order to prioritise increasing play spaces where there is a higher proportion of children and young people within the population. The quantity of

equipped play has also been calculated based on the population under 18. These results are shown in **Table 6.2**.

Table 6.2: Quantity of parks and play spaces in Broxtowe by analysis area

Area	Number of sites	Total area (hectares - ha)	Area (in ha) per 1,000 population	Area (in ha) per 1,000 child population
Central	6	0.44	0.04	0.18
North	14	1.20	0.04	0.19
Southeast	11	0.76	0.02	0.13
Southwest	14	0.71	0.02	0.08
Broxtowe (total)	**45**	**3.11**	**0.03**	**0.14**

6.9 The provision of equipped play areas per 1,000 population shows a different pattern to the provision of wider parks and play spaces. When comparing the quantity to the entire population, the southeast and southwest analysis areas have half the provision of the central and north analysis areas (0.02 hectares per 1,000, compared to 0.04 hectares per 1,000).

6.10 Comparing the provision of equipped play to the population under 18, the average provision across the borough is 0.14 hectares per 1,000 children. This is still lower than the Fields in Trust standard of 0.25 hectares per 1,000 children. Even in the north analysis area where there is highest provision of equipped play, this is still below the Fields in Trust recommended standard, (0.19 hectares per 1,000 children). The southwest analysis area has notably lower provision of 0.08 hectares per 1,000 children. This is compared to an average of 0.14 hectares per 1,000 children across the whole borough.

Designated informal play and youth space

6.11 Fields in Trust recommends a quantity standard of 0.3 hectares of informal play space, including Multi Use Games Areas, pump / BMX tracks and other informal play elements. **Table 6.3** shows the quantity of designated informal play and youth spaces, compared to total and child population. There is a significantly lower provision of informal play spaces compared to the Fields in Trust standard.

Table 6.3: Quantity of parks in Broxtowe by analysis area

Area	Number of sites	Total area (hectares - ha)	Area (in ha) per 1,000 population	Area (in ha) per 1,000 child population
Central	1	0.05	<0.00	0.02
North	11	0.69	0.02	0.11
Southeast	7	0.16	0.01	0.03
Southwest	12	3.55	0.09	0.42
Broxtowe (total)	**31**	**4.34**	**0.04**	**0.20**

6.12 There is a wide variety in the provision of designated informal play and youth spaces across the borough. Over three quarters of the provision is located in the southwest analysis area. Much of this is contributed by the BMX track area at Hemlockstone. Compared to the population, this equates to a quantity of informal play and youth spaces of 0.09 hectares per 1,000 people and 0.42 hectares per 1,000 children in the southeast analysis area. Whilst this is four times higher than any of the other analysis areas, it is still lower than the Fields in Trust Standard compared to the full population.

6.13 However, there may be other informal play and youth spaces which have not been included within this quantity analysis. This includes those spaces that

Accessibility analysis

Approach

6.14 Accessibility catchments have been set for each type of play provision identified in Broxtowe. These are expressed as straight line ‘walk-time’ distances, recognising the likely distance people are willing to travel to reach different types of play facility. These are informed by Fields in Trust standards as well as Broxtowe Council's ambition for everyone to be within a 10-minute walk of a park or play space. These access catchments are shown in **Table 6.4**.

Table 6.4: Play space hierarchy and corresponding access buffer distances

Typology	Access buffer distance
Local Areas of Play (LAPs)	100 metres
Locally Equipped Areas for Play (LEAPs)	400 metres and 100 metres
Neighbourhood Equipped Areas for Play (NEAPs)	1000 metres, 400 metres and 100 metres
Youth spaces	700 metres
Sport provision	1200 metres
All parks and play spaces	800 metres (equivalent to a 10-minute walk)

6.15 The estimated population within each buffer has been calculated by multiplying the percentage area of each Lower Super Output Area (LSOA) covered the buffer by the total child population in that LSOA. This estimates the child population with access for each LSOA (in a scenario where child population was spread evenly across the LSOA). The estimated child population with access for all the LSOAs within each analysis area is divided by the total child population for all the LSOAs in that analysis area.

Existing access to parks and play

6.16 The estimated population covered by buffers if shown in **Table 6.5**. This sets out the estimated percentage of children with access to a LAP, LEAP or NEAP in 100 metres, a LEAP or NEAP within 400 metres, or a NEAP within 1,000 metres.

Table 6.5: Estimated percentage of child population within access to equipped play

Area	Access within 100 metres	Access within 400 metres	Access within 1000 metres
Central	5%	31%	71%
North	13%	60%	80%
Southeast	17%	70%	100%
Southwest	18%	70%	100%
Broxtowe	**15%**	**63%**	**91%**

6.17 Only an estimated 15% of children have access to any play spaces (LAP, LEAP or NEAP) within 100 metres. The majority of residents throughout all analysis areas do not have access to equipped play at this distance.

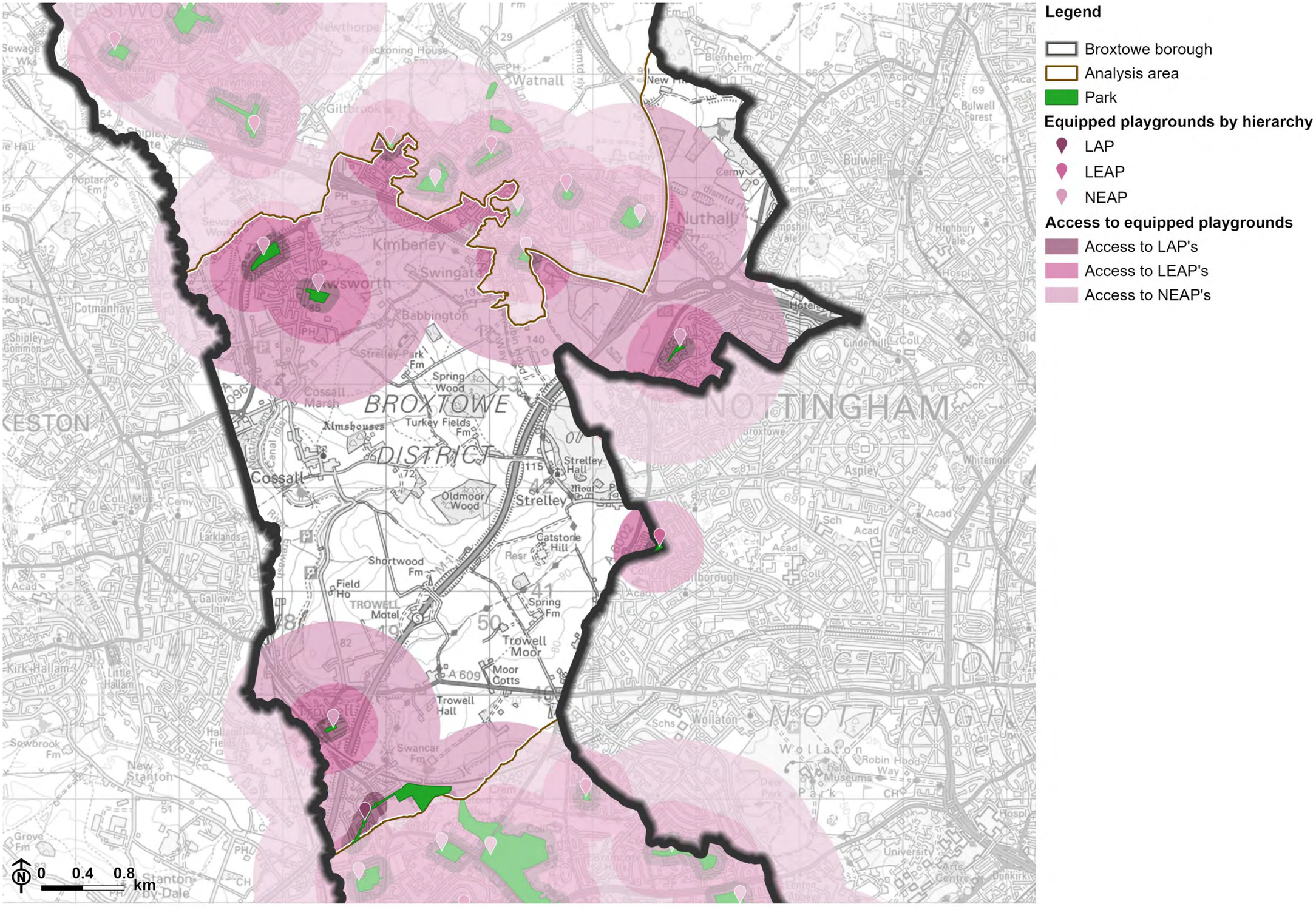
6.18 Access to NEAP and LEAP within 400 metres varies throughout Broxtowe. Overall, an estimated 63% of residents have access to this. There is lower provision in the central analysis area where only an estimated 31% of residents have access. Gaps in access include around Trowell Park, the northern edge of Trowell, Cossall and parts of Awsworth. Additionally, smaller villages such as Strelley and Trowell Moor. In the north analysis area, gaps in access are generally along the edges of settlements and within villages. This includes the west of Brinsley, northern and southern edges of Eastwood, east of Giltbrook and north of Watnall. Additionally there is gaps in access within the villages of Moorgreen, Greasley, and Bogend. In the southeast there are gaps in access to equipped play at 400 metres are more scattered throughout the analysis area, including larger gaps northwest of Beeston centre, in the centre of Bramcote Hills and in the west of Beeston Rylands. A similar pattern emerges in the southwest analysis area, with gaps in parts of Chilwell and northeast Toton.

6.19 The best access to equipped play in Broxtowe is to NEAPs. It is estimated that 91% of children within Broxtowe have access to this type of play space within 1,000 metres. This includes all children in the southeast and southwest analysis areas. There are some residential areas without gaps to this provision. In the central analysis area this includes Cossall, Strelley and parts of the urban edge of Nottingham. In the north analysis area this includes a gap in access around Giltbrook as well as the northern edge of Watnall.

6.20 For all equipped play hierarchies, there is better access within the southeast and southwest analysis areas. These are more urban with higher population densities. In rural areas, residents may have lower access to the range of play spaces. Where residences are highly dispersed and greater than 100 metres or 400 metres from other properties it is not feasible to provide the range of equipped play facilities for all residences.

6.21 Maps showing these access catchments for each analysis area are provided in **Figure 6.1** to **6.4**.

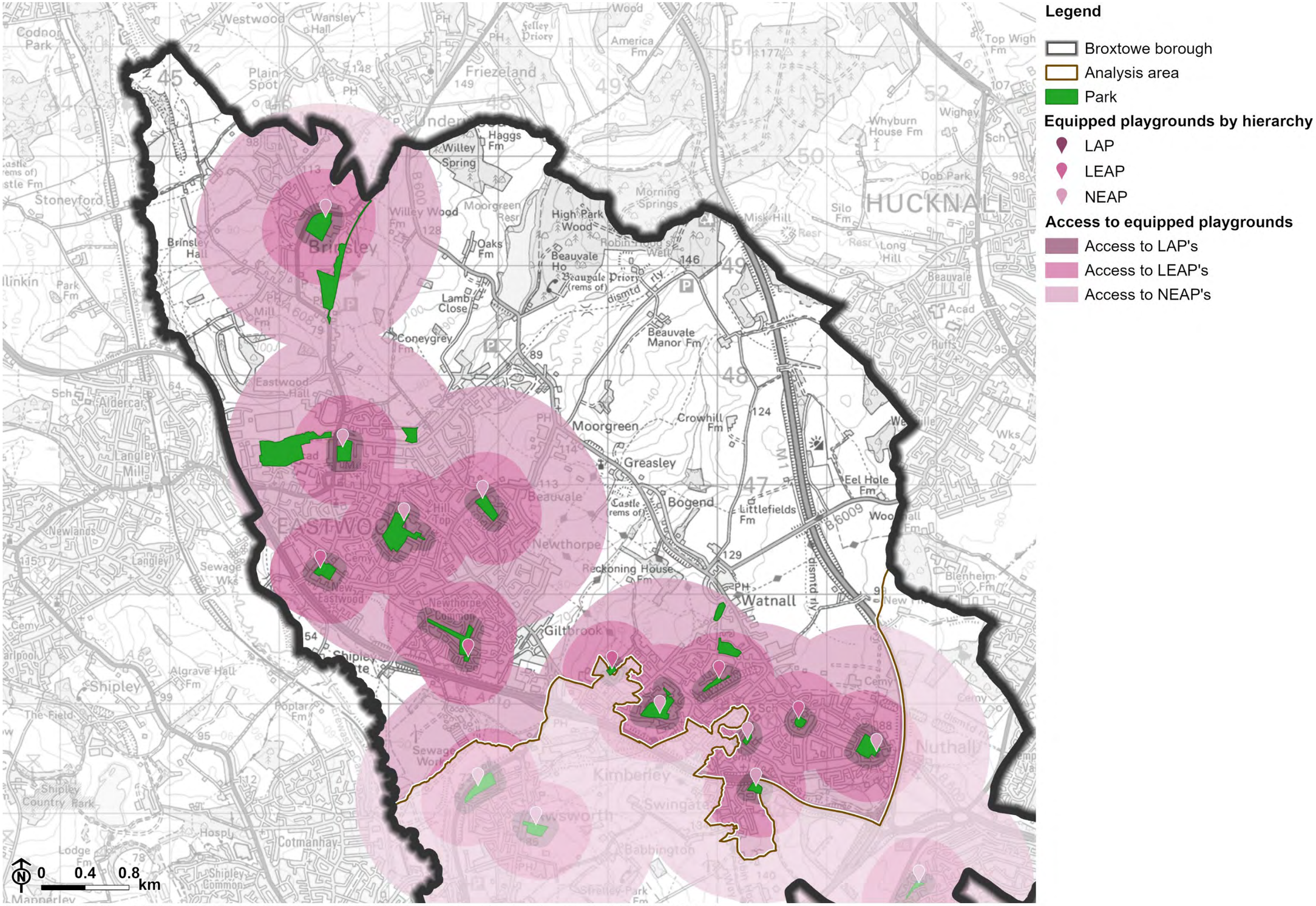
Figure 6.1: Access to equipped play in the central analysis area



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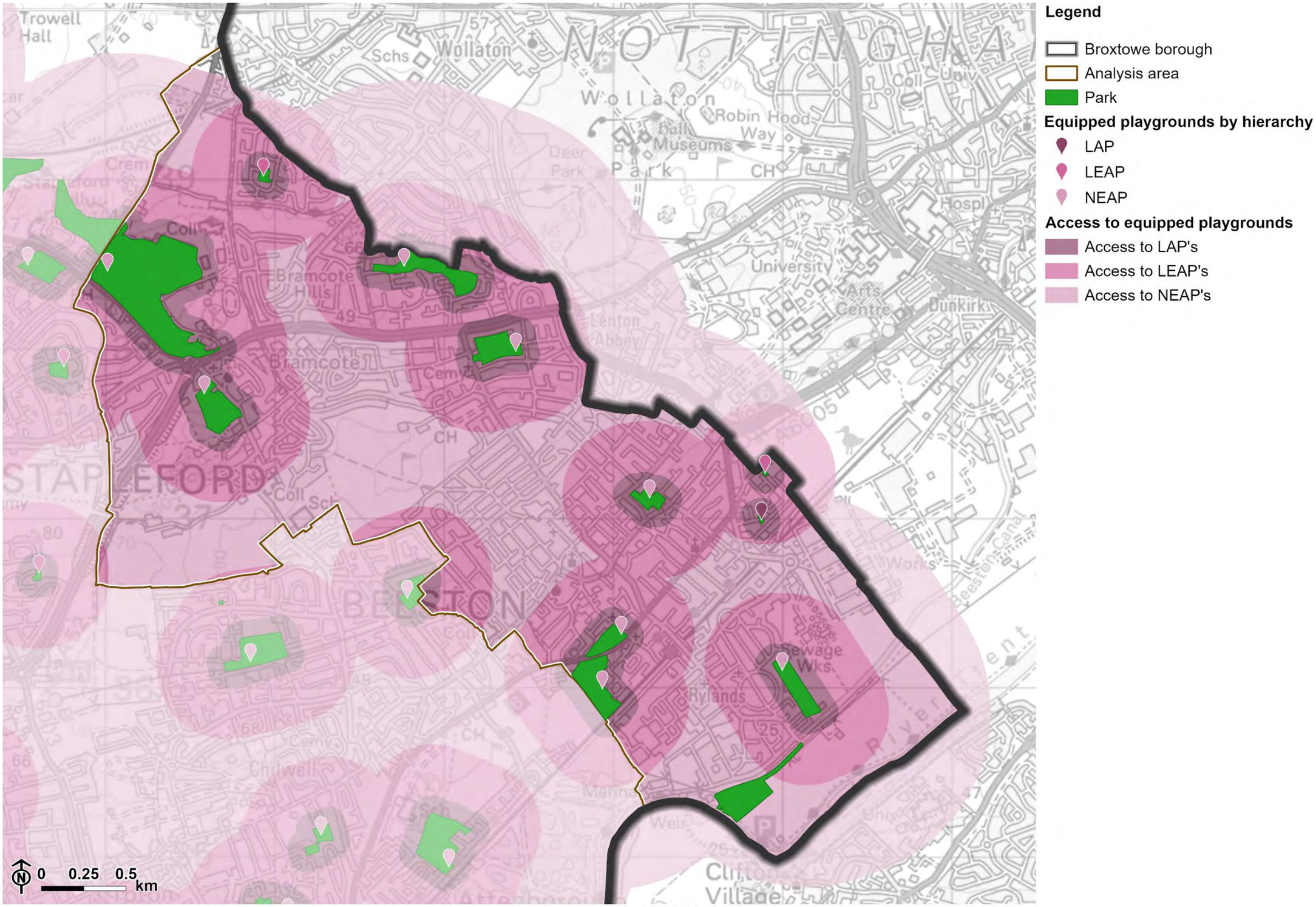
Figure 6.2: Access to equipped play in the north analysis area



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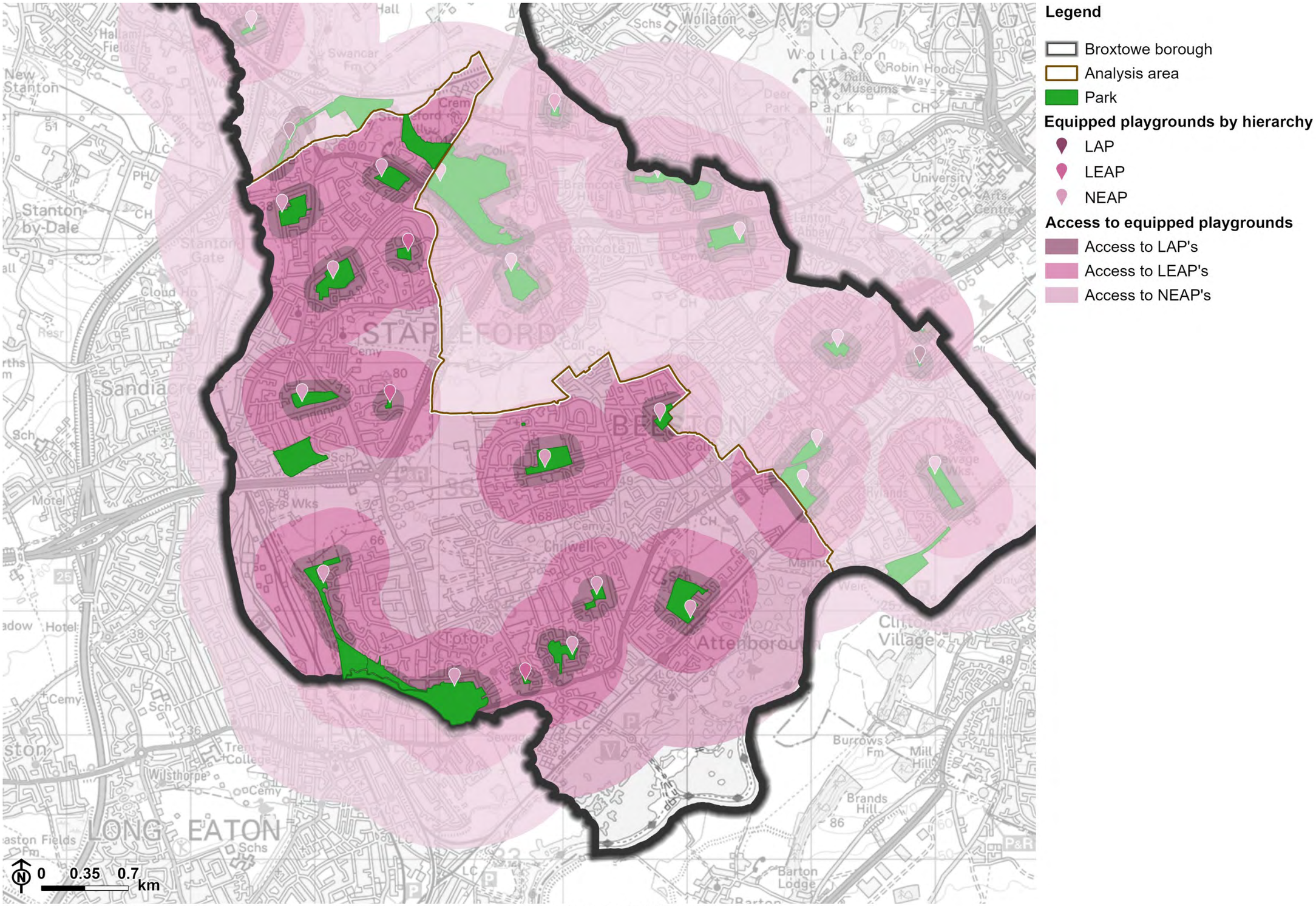
Figure 6.3: Access to equipped play in the southeast analysis area



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Figure 6.4: Access to equipped play in the southwest analysis area



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6.22 The estimated percentage of child population with access to designated informal play / youth spaces, sports and all parks and play spaces is shown in **Table 6.6**.

Table 6.6: Estimated percentage of child population with access to other play spaces

Area	Access to informal / youth spaces	Access to sport provision	Access to park or play space
Central	33%	74%	64%
North	62%	90%	87%
Southeast	90%	100%	100%
Southwest	90%	100%	99%
Broxtowe	**76%**	**94%**	**92%**

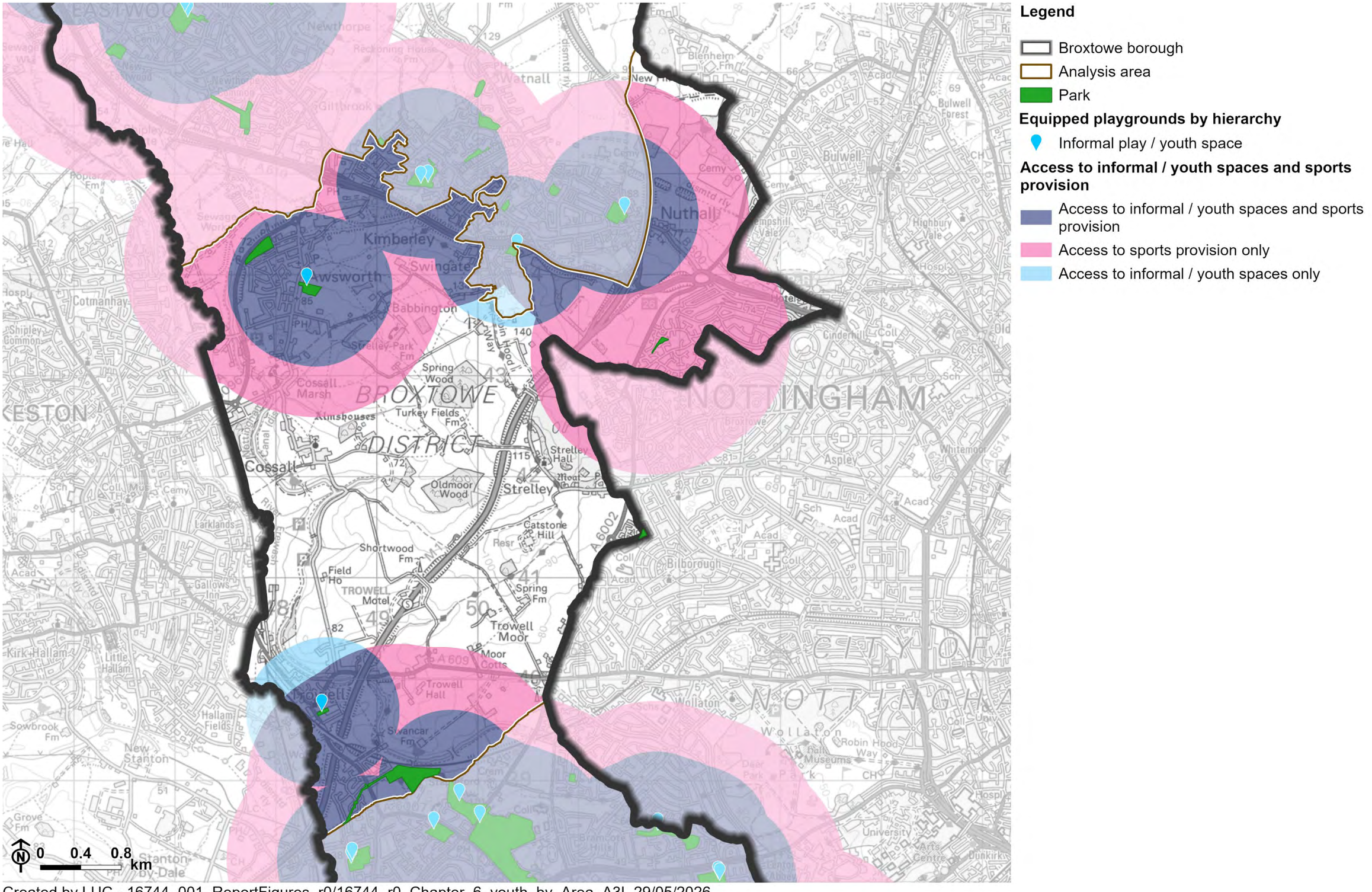
6.23 Overall, 76% of children in Broxtowe have access to informal play / youth. Compared to other play typologies, there is a strong divide between the analysis areas (from 90% access in the southeast and southwest to 33% access in the central analysis area). Key residential areas without access to informal / youth spaces include Giltbrook, Watnall and villages of Bogend, Greasley and Moorgreen. In the central area key gaps in access include Cossall and the eastern edge of the analysis area which incorporates the urban edge of Nottingham. Additionally, rural properties around Trowell Moor do not have access to these types of play.

6.24 Access to sport is high across the analysis areas. 94% of children are estimated to have access to sport provision within 1200 metres. The main gaps in provision to this access include rural villages within the central analysis area, including Strelley and Cossall, as well as the northern part of Trowell. In the north there are some gaps in access to sport, including in the very north of Watnall and properties around Bogend and Colliers Wood.

6.25 Maps of the informal / youth space and sport access catchments are shown in **Figures 6.5** to **6.8**.

6.26 Overall, the majority (92%) of residents in Broxtowe have access to parks and play spaces within a 10-minute walk (800 metres). Access is lowest in the central analysis area, including within Cossall, as well as rural properties around Trowell Moor. In the north, the villages of Bogend, Greasley and parts of Moorgreen do not have access within a 10-minute walk. These access catchments have been explored more in **Chapter 7**, combining access catchments with quality and value scores.

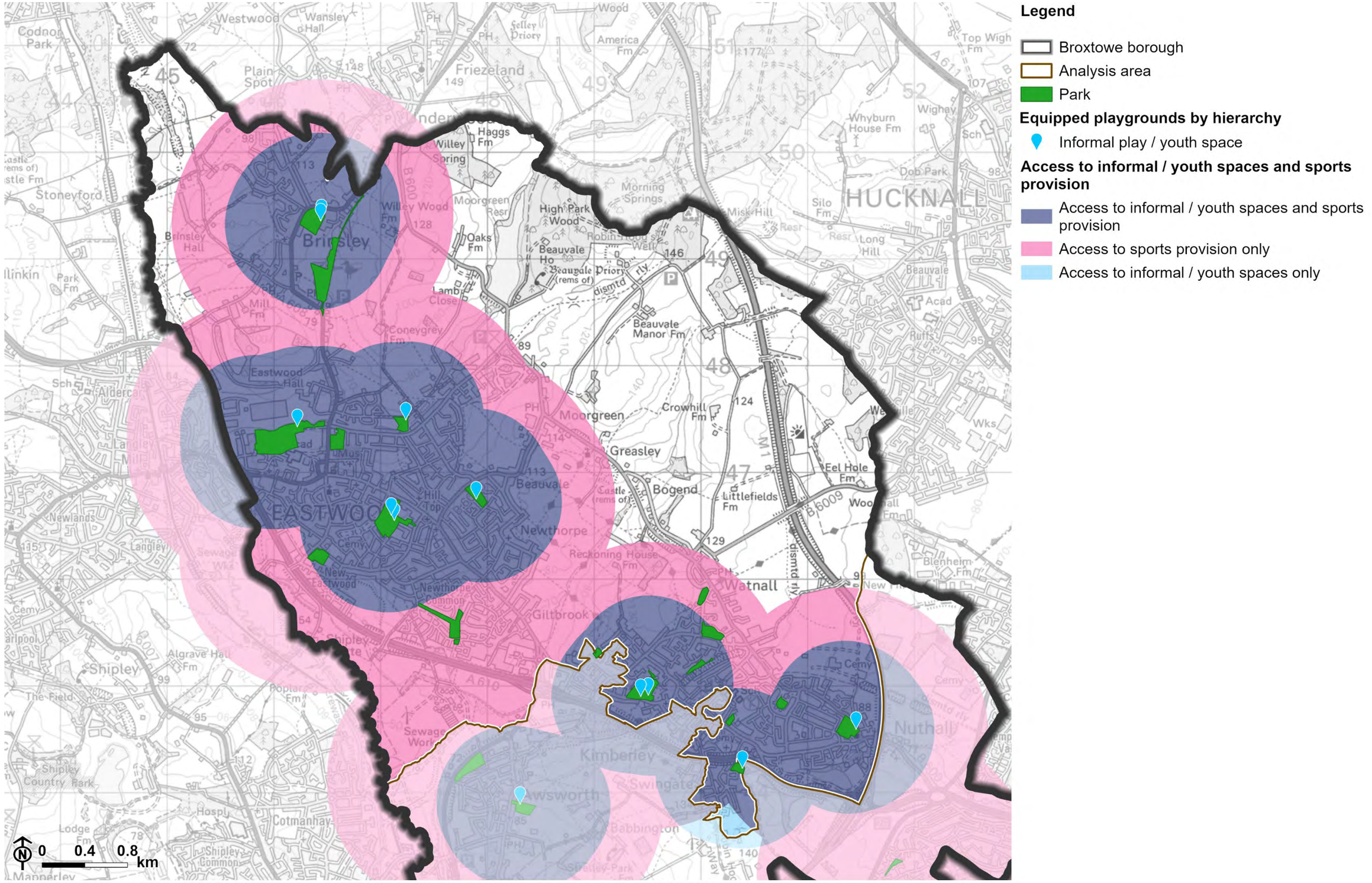
Figure 6.5: Access to informal / youth and sports provision in the central analysis area



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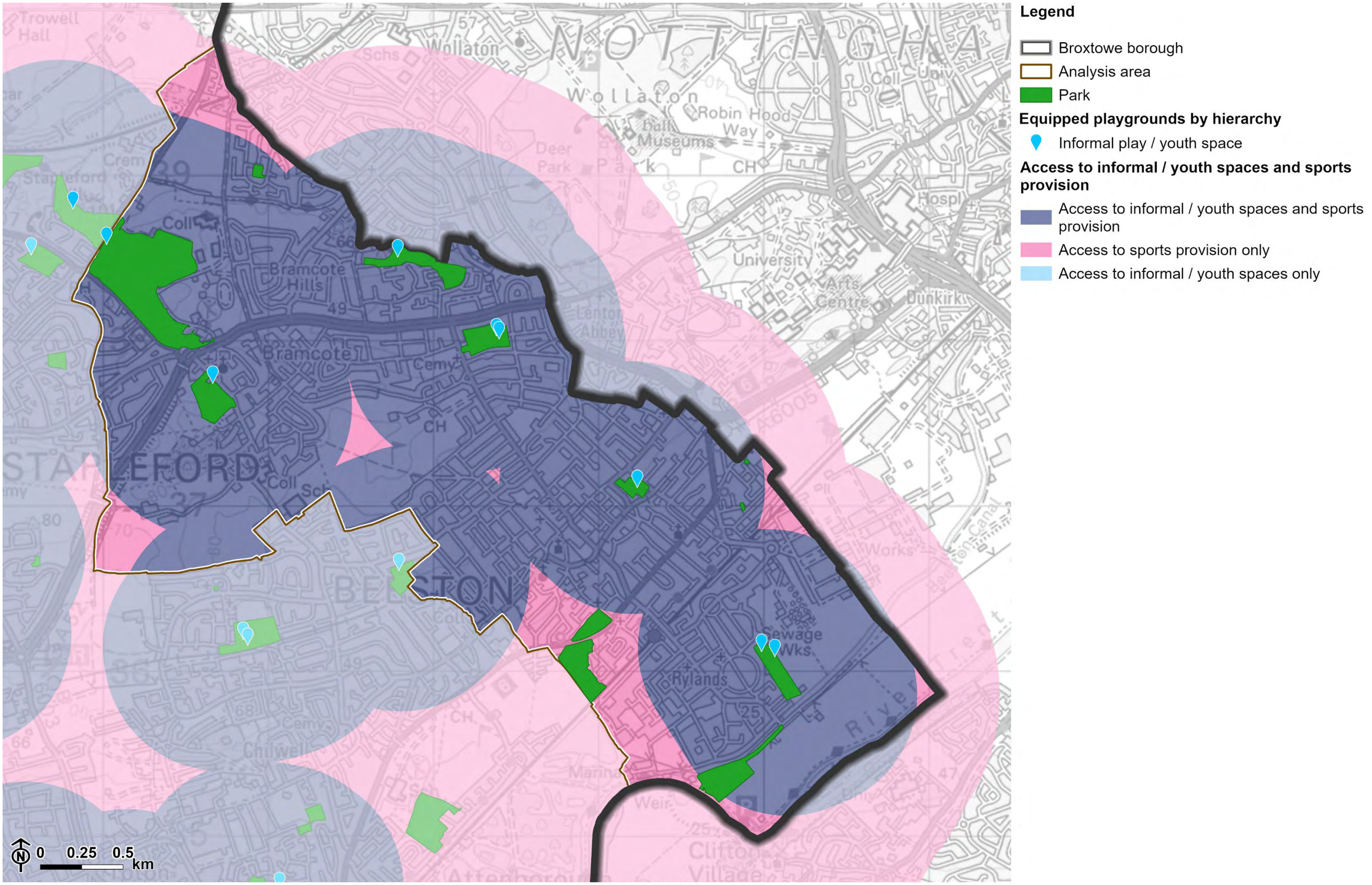
Figure 6.6: Access to informal / youth and sport provision in the north analysis area



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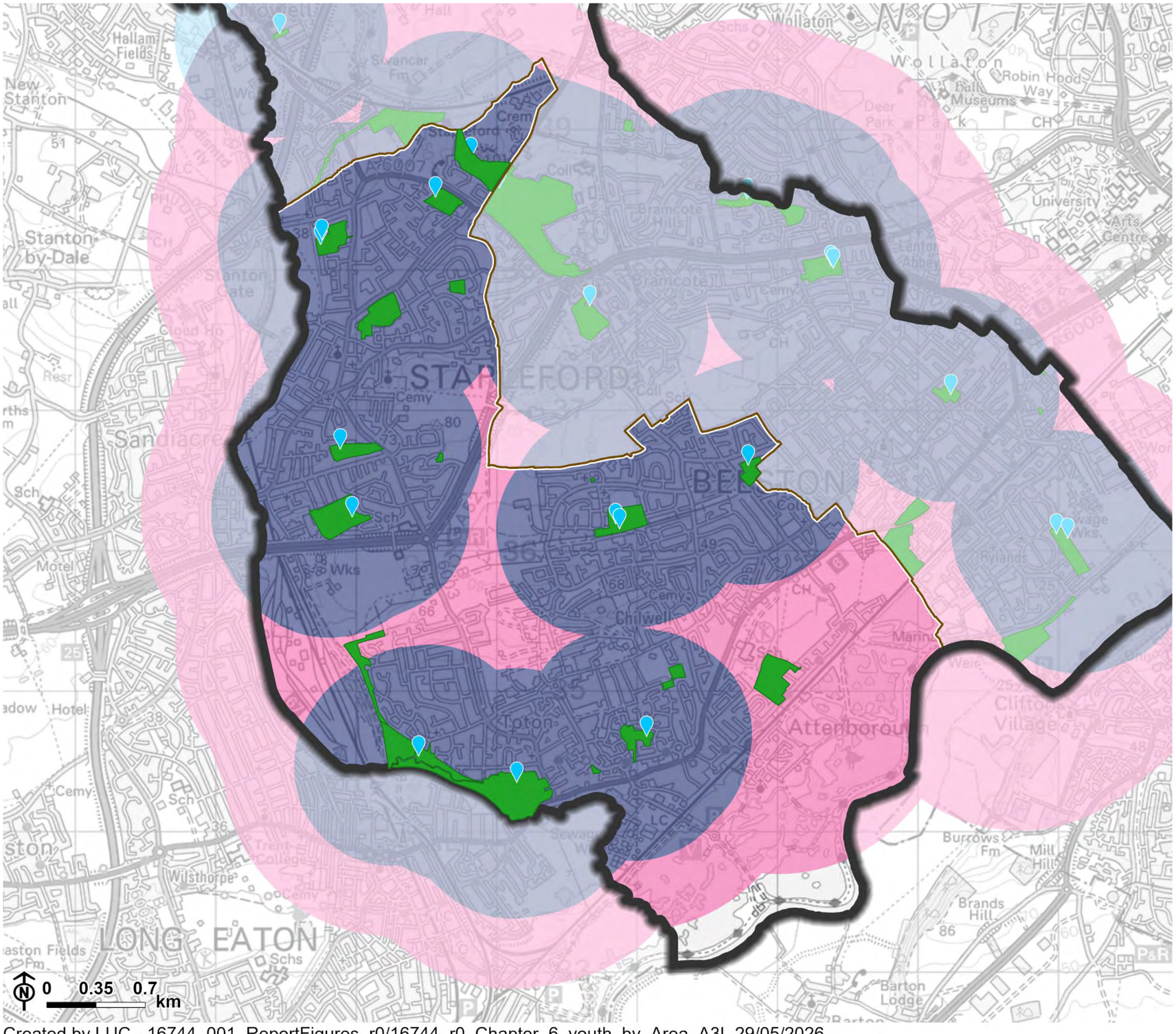
Figure 6.7: Access to informal / youth space and sport provision in the southeast analysis area



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Figure 6.8: Access to informal /youth and sports provisionin the southwest analysis area



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Chapter 7
Priorities and recommendations

7.1 Based on the analysis in Chapters 5 and 6, this section identifies the priority recommendations to enhance play provision within Broxtowe. Broad recommendations have been set per theme and then the overall access catchments, provision and need have been assessed to identify priority areas and parks for investment.

Priority themes for improvement

Theme 1: Inclusive and community orientated

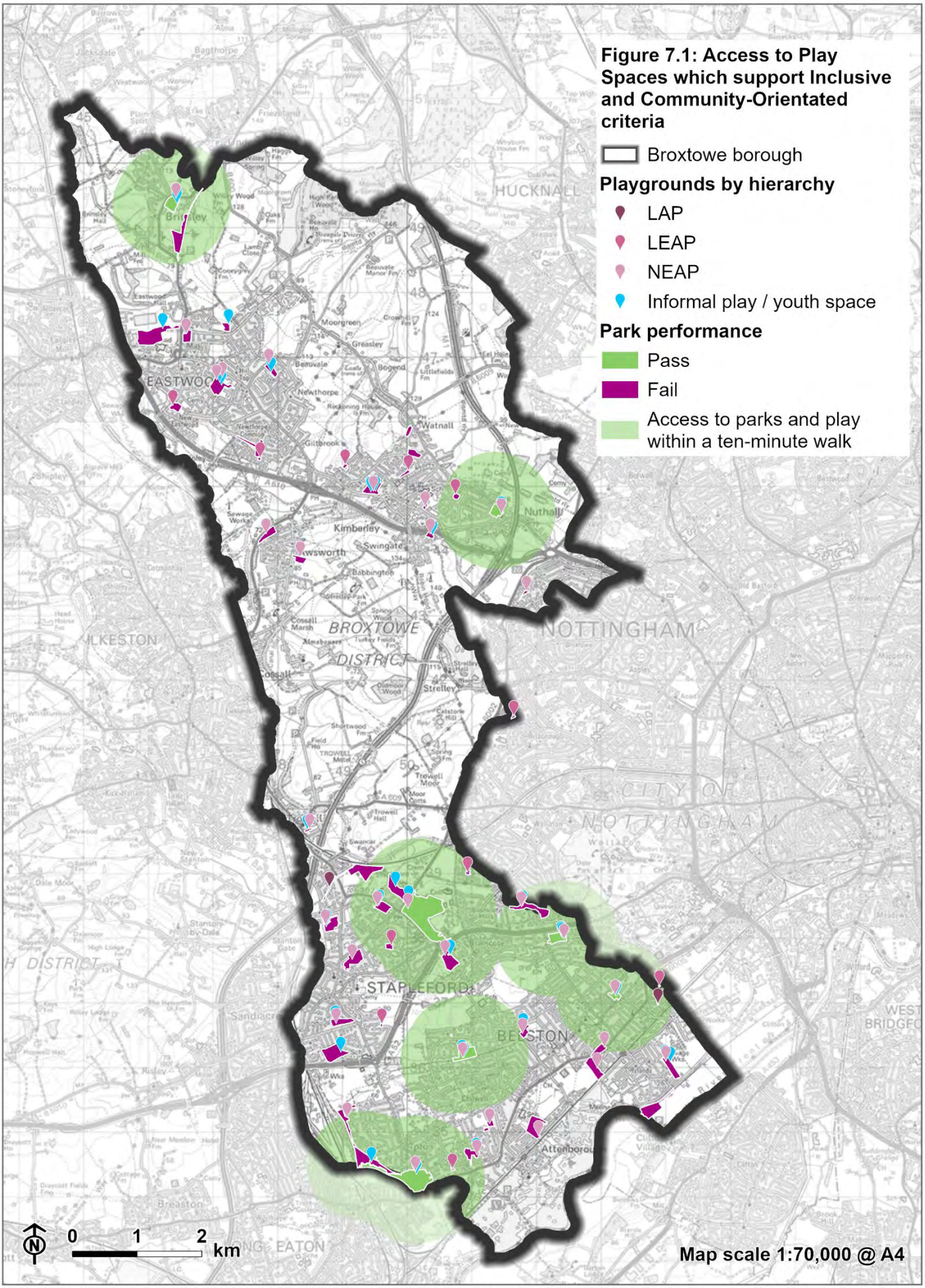
7.2 Figure 7.1 shows the 10-minute access catchments for all parks and play spaces which meet the inclusive and community orientated theme benchmark (as set out in **paragraph 5.18**). There are gaps in access to these spaces through all of Eastwood and Kimberley, Awsworth, Trowell, most of Stapleford, Attenborough, Beeston Rylands and parts of Beeston.

7.3 In order to reduce these gaps, enhancements to improve features promoting inclusion and community orientation should be prioritised in Coronation Park, Hall-Om-Wong Open Space, Shilo Recreation Ground, Hetley Pearson Recreation Ground and Hickings Lane Recreation Ground.

7.4 Suggested actions to enhance the inclusive and community-orientated value of parks and play spaces have focussed particularly on inclusive play equipment for disabled users. Whilst this theme is about access for all users, this was a key issue for many during consultation.

7.5 Improvements to support this theme include the following 'quick wins':

- Ensure spaces with accessible play equipment are signed and marketed as such, allowing disabled users to easily find and access these spaces. This information should also include distance to nearest parking and information on parking (e.g. open hours, inclusion of disabled parking bays).
- Where accessible play equipment is not accessed directly from a surfaced path, explore the need for this.
- Avoid locating accessible play equipment within large areas of bark chipping which are harder to navigate for wheelchair users.



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- As benches need replacing, prioritise installing inclusive benches, such as picnic benches for spaces with wheelchair users and ensure these are on a level surface with access paths.

7.6 As part of larger investment projects, there is the opportunity to expand the range of inclusive equipment available for disabled children in addition to existing provision of roundabouts and swings. For example, ramped climbing areas which allow children of all abilities to get into the centre of the play action.



7.7 Where play spaces are located close to community facilities, schools or sports clubs there may the opportunity to explore more supervised play sessions or events which may support children who are less confident playing in outdoor settings to get involved.

7.8 Other opportunities to engage with local communities for strategic enhancements should also be explored.

- There is the opportunity to work with local communities to design new welcoming signage for spaces which encourage all children to play together and have fun, as well as providing important safety information.

- There is the opportunity to invest in an online 'reporting tool' through QR codes in play spaces, allowing users to report any management or maintenance issues on site.

7.9 Work with local communities to enhance provision for older children, particularly teenage girls. Projects to improve provision for these ages can include lower investment projects, such as social seating which is signed as being part of a youth zone or stepping stone platforms with seating facing each other. Larger may include large areas of netting or hammocks, performance areas, large swings with a specific teenage zone or large ground trampolines. Use of these spaces for disabled young people should also be accommodated.



7.10 A lack of toilets presents a barrier for some users, however provision of toilets at all play spaces is not feasible to manage and maintain. A number of larger, centrally located play sites in communities across Broxtowe should be identified as 'destination play spaces'. These should ensure the best provision for all users. Investment in toilet facilities within these spaces should be prioritised. Communications to inform users about these investments will ensure all users are aware of their nearest space with this offer.

Theme 2: Active and healthy

7.11 Figure 7.2 shows the 10-minute access catchments for all parks and play spaces which meet the active and healthy theme benchmark (as set out in **paragraph 5.28**). There are gaps in access to these spaces in Brinsley, Giltbrook, Awsworth, Trowell, Attenborough, Beeston and Beeston Rylands.

7.12 Smithurst Road Open Space, Shilo Recreation Ground, Hetley Pearson Recreation Ground are priority spaces for improvements to active and healthy features to reduce these gaps.

7.13 Contributions to scores for the active and healthy theme include provision for sports, which often takes up space and may not be appropriate to add into all spaces. Additionally, research has found that sport-based play provision for teenagers is mostly used by teenage boys.

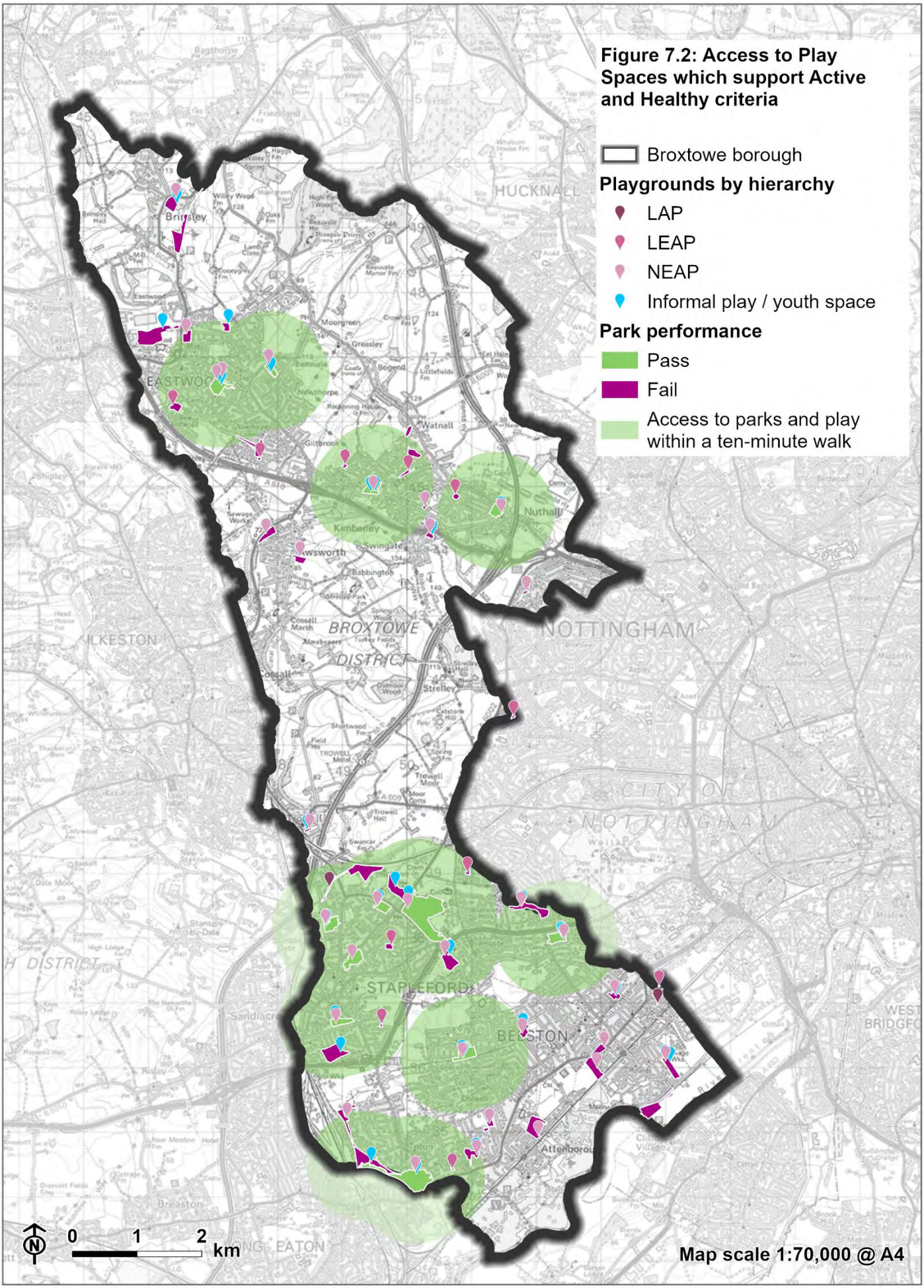
7.14 However, there are other enhancements which can further promote active and healthy lifestyles for children and take up less space. For example, active routes to sites can be promoted, including signage along existing off-road long-distance trails. Cycling parking, including space for accessible cycle parking within larger parks can also encourage this.

7.15 Additionally, BMX and mountain biking are pursuits undertaken in Broxtowe. In places these are threatening habitats within Local Wildlife Sites, including at Watnall Spinney, Watnall Green and Hemlockstone. Provision of new dedicated spaces for this can create safer opportunities for BMX and help protect nature.

7.16 Where space is limited, ground graphics or signage can still encourage physical activity, for example as present within Dovecote Lane Recreation Ground. This can also set challenges, e.g. encouraging activities to be completed in the quickest time.

7.17 Compared with other play affordances, crawling and hiding, and jumping were recorded less frequently in Broxtowe. Equipment to support these affordances could be incorporated into spaces. This could include ground trampolines which are also accessible for wheelchair users.

7.18 Additionally, all play spaces should be managed and maintained to ensure they are safe for all users. This includes ensuring safety surfacing is present and in good condition. All play spaces should include signage which informs users of the age ranges of children that the space is aimed for, states that the play area should be dog free (where appropriate) and provides an emergency contact.



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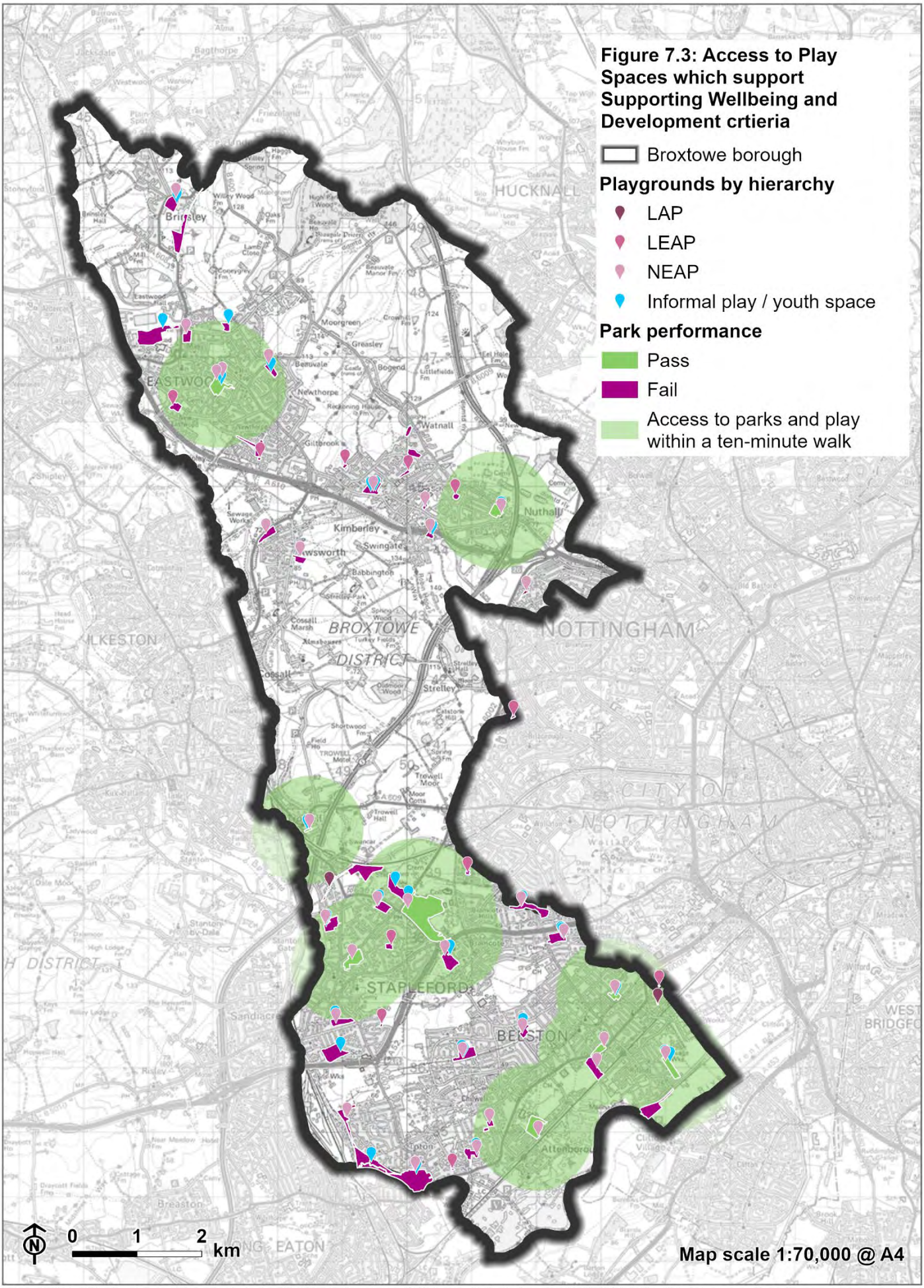
Theme 3: Supporting well-being and development

7.19 Figure 7.3 shows the 10-minute access catchments for all parks and play spaces which meet the supporting well-being and development theme benchmark (as set out in **paragraph 5.37**). There are gaps in access to these spaces in Brinsley, Giltbrook, Kimberley and Watnall, Awsworth, Toton, Chilwell and north Beeston. Compared to other themes, this theme generally included lower scores within the audit and should be a priority for enhancement across Broxtowe.

7.20 In order to reduce these gaps, priority enhancements to improve features supporting well-being and development should be considered at Brinsley Headstocks, Beeston Fields Recreation Ground, Inham Nook Recreation Ground, Manor Farm Recreation Ground and Hickings Lane Recreation Ground.

7.21 Enhancements to this theme can include relatively low-investment and low space interventions, which can also be included within nature-sensitive sites with damaging wildlife. For example, child-friendly, playful signage which encourages imaginative, social or nature-based play and provide education on local heritage or nature. Sculptures and other artwork could also be considered to fulfil this purpose. The use of QR codes to keep these updated may also be suitable for older children.





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7.22 On unused tarmac or other hard surfacing, inclusion of ground graphics can create play opportunities, particularly for younger children. For example, hopscotch or snakes and ladders. In addition to integrating these into parks, this could also increase the play value of other infrastructure within Broxtowe, including pedestrianised areas within town or village centres.

7.23 Similarly, on bare walls, murals can create a more visually appealing, playful space which could encourage imaginative informal play for children. Creation of murals could be done with local artists and communities, offering children and young people a creative outlet and an element of ownership over the space.

7.24 Small sensory play elements, such as musical equipment can be included within spaces which are spatially constricted. These can be designed for the site, for example timber equipment within more natural spaces including woodland. In larger sites, areas of sand and water play can be incorporated. Raised sandpits with ledges for disabled children to sit at and access sensory play areas can offer a more inclusive option for sensory play.

7.25 Where more substantial investments are taking place, opportunities for challenging and large-scale imaginative play structures can be considered. This should be prioritised in larger, destination spaces which can attract users from several communities within Broxtowe. This may include large structures allowing children to climb higher than standard play equipment offers.



7.26 Additionally whole playgrounds could be themed around features of local interest such as the windmill ruins at Millfield Road Open Space. Inclusion of large scale projects such as these would need to ensure there is resource for the ongoing management and maintenance of such structures.

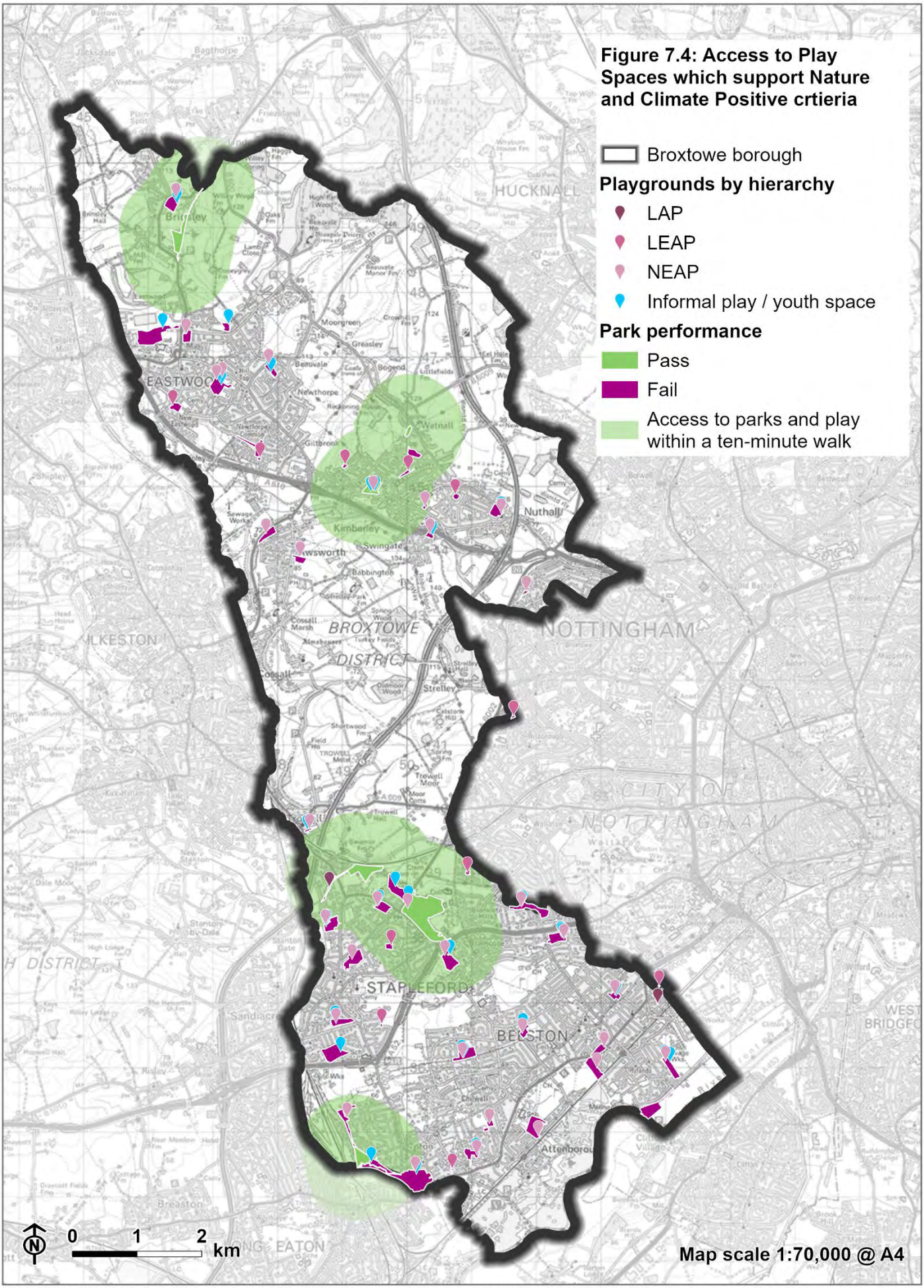
Theme 4: Nature and climate positive

7.27 Figure 7.4 shows the 10-minute access catchments for all parks and play spaces which meet the nature and climate positive theme benchmark (as set out in **paragraph 5.47**). There are gaps in access to these spaces in Eastwood and Giltbrook, Nuthall, Awsworth, Trowell, Stapleford, Attenborough, Chilwell, Beeston and Beeston Rylands.

7.28 In order to reduce these gaps, enhancements to improve features promoting nature and climate positive spaces should be prioritised in Coronation Park, Hall-Om-Wong Open Space, Shilo Recreation Ground, Hetley Pearson Recreation Ground and Hickings Lane Recreation Ground.

7.29 Enhancements for this theme could include introducing herbaceous and shrub planting along fenced boundaries to equipped play. This could offer a more visually attractive boundary and help integrate the play area into the wider natural environment. Additionally, this reduces the need for frequent grass cutting / control adjacent the equipped area.





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7.30 In woodland areas, including nature reserves, there are opportunities for natural play, including informal play opportunities. This could include interventions which also promote the supporting well-being and development theme, such as educational signage, nature trails and timber sculptures. Additionally, areas for den building should be considered in woodland areas.

7.31 Setting equipped play within areas of vegetation can create more adventurous play opportunities and encourage children who may be more nervous interacting with nature into more natural spaces. Within natural spaces, timber equipment may be more appropriate to further integrate into the settings.



7.32 Investments in new play areas should consider how these can be designed to be more resilient to a changing climate. For example, what the drainage on site is like and whether inclusion of sustainable drainage features is required. Additionally, shading within or close to play areas will allow play areas to remain useable in a warming climate. This could be through natural shading from trees. Where management resource or safety concerns for trees are an issue, built sheltered areas within play areas may also be considered.

Priority locations for improvement

7.33 In addition to applying the 10-minute access catchment based on performance per theme, these have also been applied based on the quality and value scores.

Central analysis area

7.34 In the central analysis area, the only residents with access to high quality parks and play spaces are those in the southern part of Trowell. Elsewhere, access is restricted to spaces which do not meet both the quality and value benchmarks. This is shown in **Figure 7.5**.

7.35 In the eastern edge of the analysis area and in the north of Trowell, parks and play spaces do not meet the value benchmark. This suggests that improvements would more likely include capital investments to increase play provision within the site. However, these spaces are relatively small and scope to improve these spaces may be limited.

7.36 In Awsworth all the access is to spaces which do not meet either quality or value benchmark. Improvements to play spaces in Awsworth is a priority. Shilo Recreation Ground currently includes provision of a NEAP and youth areas and is the priority for enhancement to accommodate all ages.

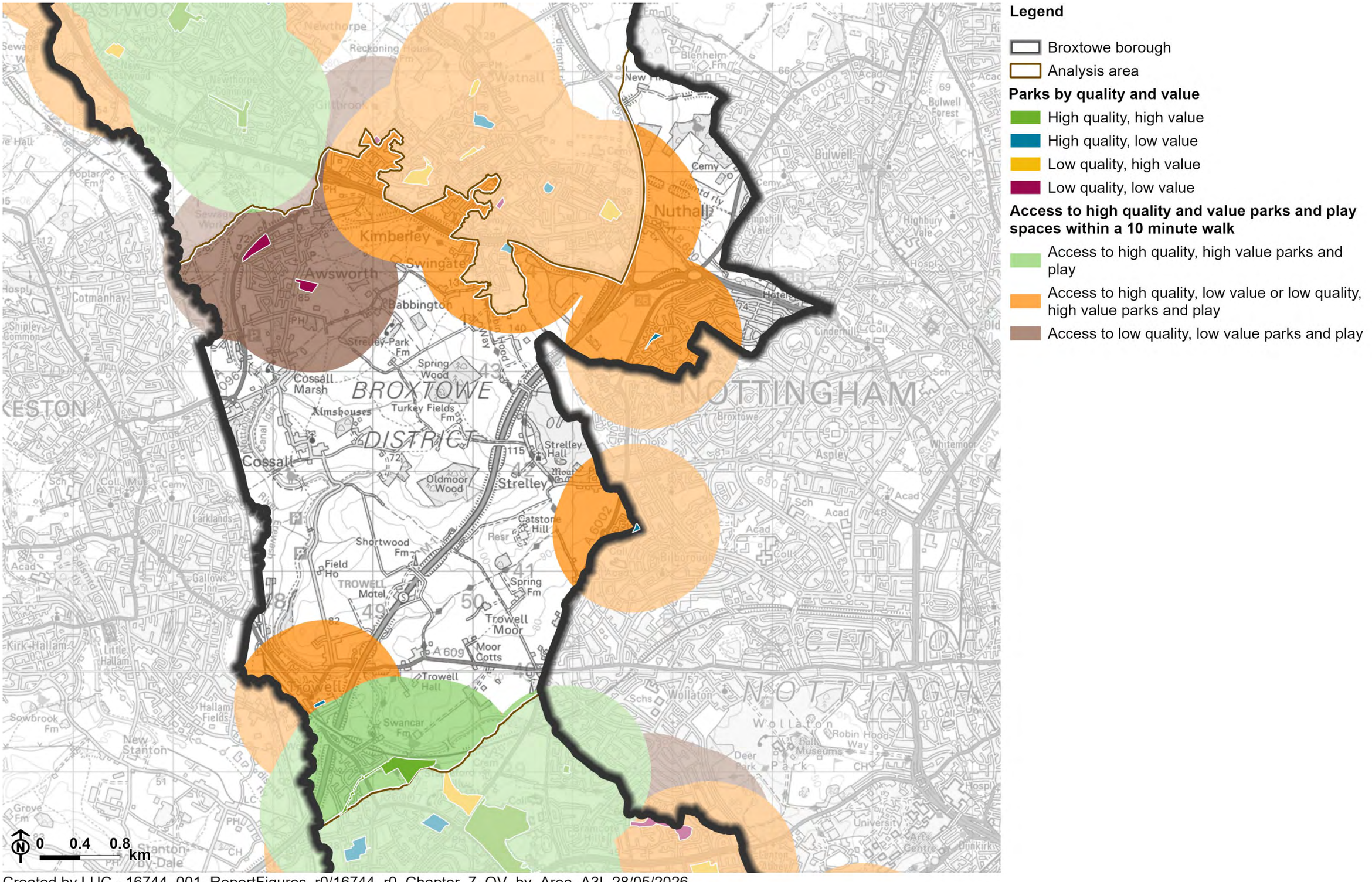
7.37 Additionally, there is a priority for introducing provision within Cossall, where there is currently no access to parks and play.

North analysis area

7.38 In the north analysis area, access to high quality parks and play areas is available within Eastwood, as shown in **Figure 7.6**. This access is provided by Mansfield Park Recreation Ground, Coronation Park and Smithurst Road Open Space.

7.39 In Brinsley, access is to spaces which do not meet the quality benchmark. Replacing worn infrastructure and ensuring management of natural features creates some safe spaces to play may help improve the quality of these spaces. The priority space should be Brinsley Recreation Ground which currently offers equipped and informal play. Brinsley Headstocks is also a local nature reserve and play investments should ensure that these do not compromise management for nature within this space.

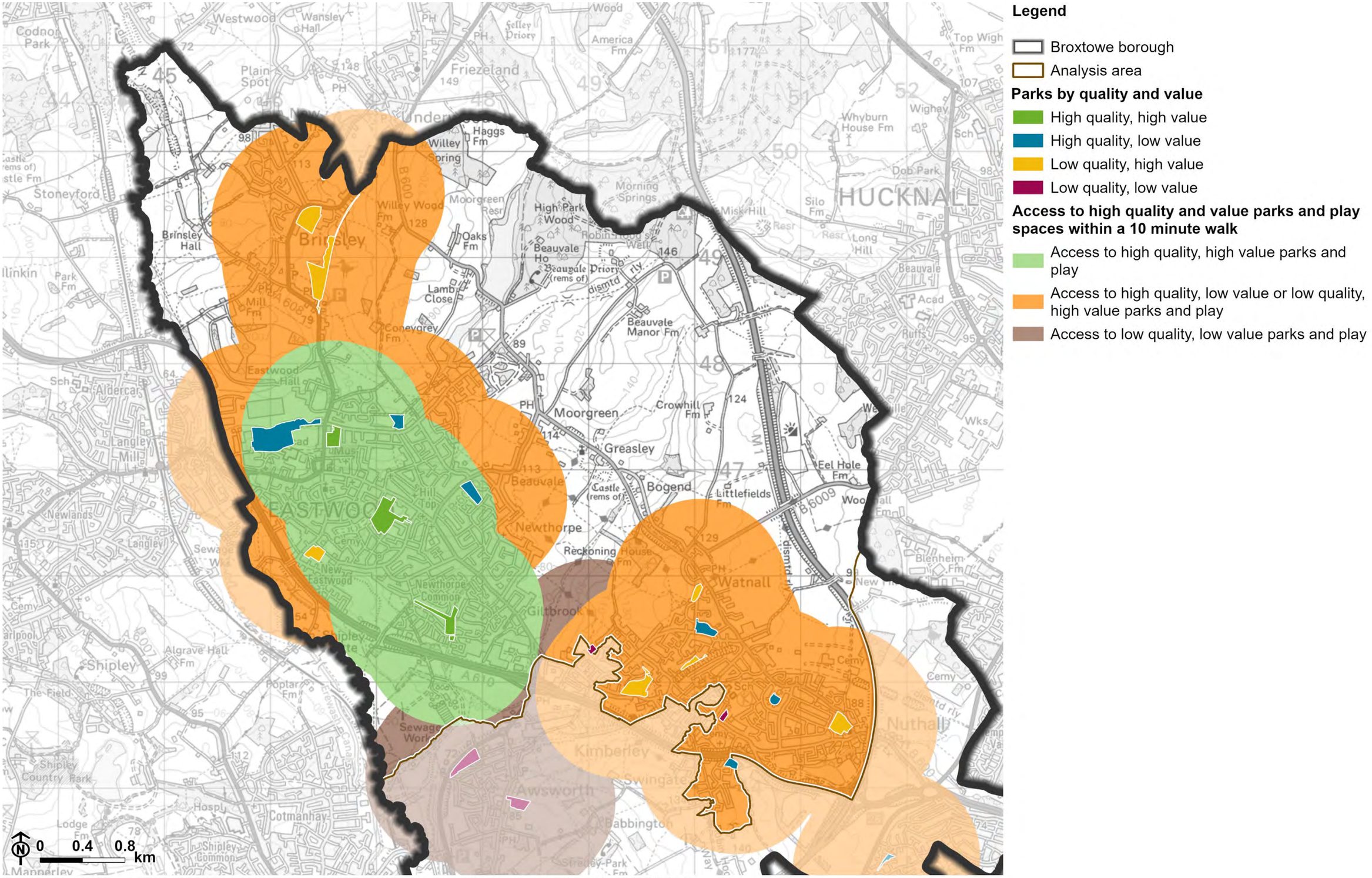
Figure 7.1: Access to high qualilty high value parks and play spaces in the central analysis area



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Figure 7.2: Access to high qualilty high value parks and play spaces in the north analysis area



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7.40 In Kimberley, Watnall and Nuthall there is good access to parks and play spaces, but none of these meet both the quality and value benchmarks. Improvements to centrally located spaces with provision for a range of ages, such as Hall-om-Wong, should be prioritised to ensure there is access to high quality and high value spaces in these areas.

7.41 Additionally, in Watnall both spaces are located within Local Nature Reserves. There was evidence in both Watnall Spinney and Watnall Green of bike use impacting the sites. Opportunities to create a dedicated BMX track in a space less sensitive for nature should be a priority to reduce this damage.

7.42 Access to parks and play is limited for villages within the north analysis area. Opportunities for creating a wider country-park space around Greasley, as set out in Blue and Green Infrastructure Study **[See reference** 91**]** could include natural play elements to improve provision to these more rural parts of the analysis area.

Southeast analysis area

7.43 There is good access to parks and play spaces within a 10-minute walk in the southeast analysis area. This is shown in **Figure 7.7**. There is access to high quality and high value spaces in the south and north of the analysis area.

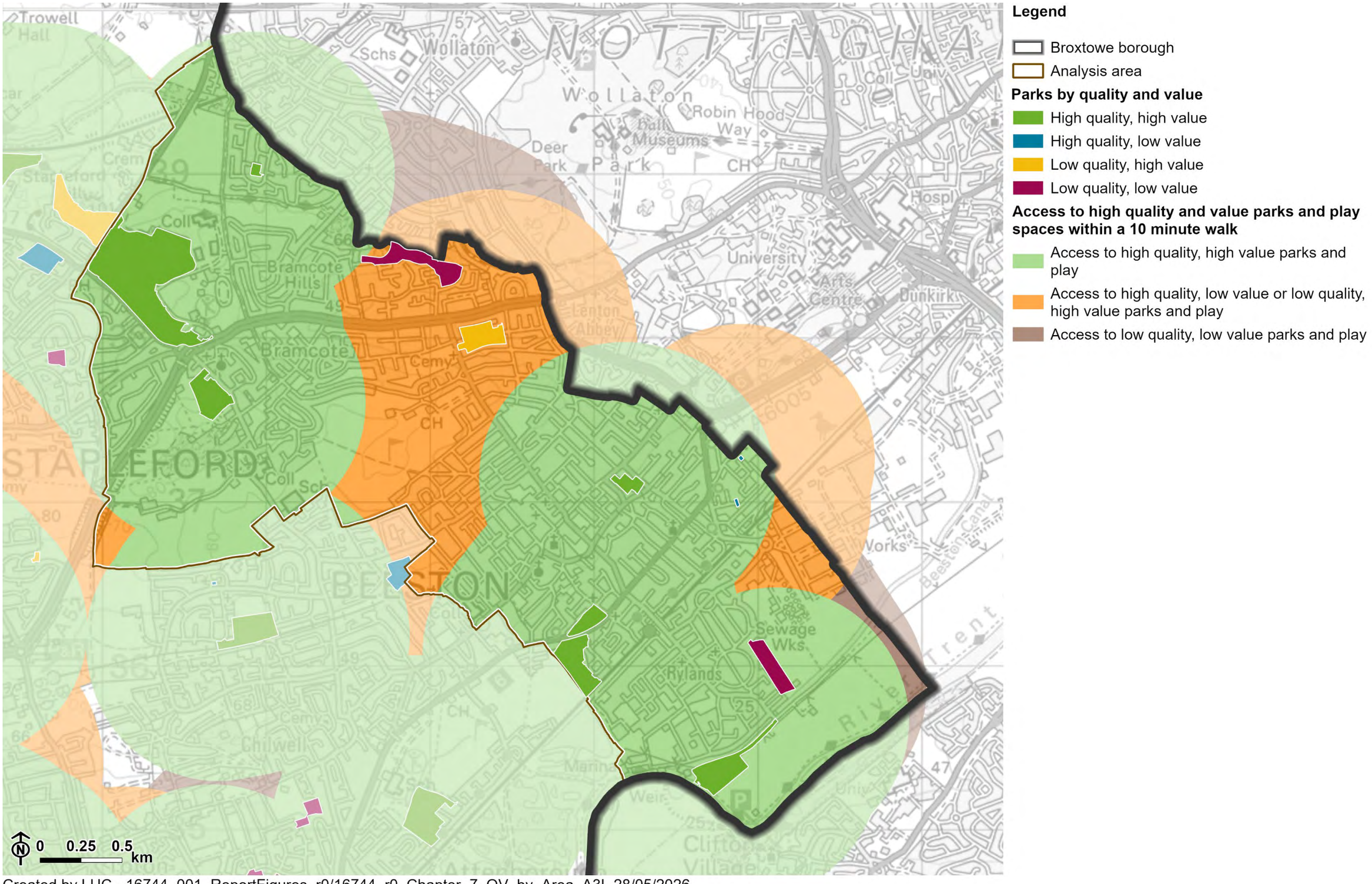
7.44 There is a notable gap in provision to high quality and low value spaces within the central part of the southeast analysis area. Most of this area is served by Beeston Recreation Ground and Sandy Lane Nature Reserve.

Southwest analysis area

7.45 Figure 7.8 shows that the majority of places within the southwest analysis have access to high quality and high value parks and play spaces. This includes Chilwell and Attenborough.

7.46 In Toton, access to high quality and high value parks and play is provided by Toton Fields Local Nature Reserve. This offers wider informal play opportunities, but does not include any equipped play or designated informal or youth spaces. Additionally, due to the importance of the site for wildlife, there is limited scope to enhance the play offer at this site. Therefore, improvements to additional sites within Toton to ensure these meet the quality and value standards for the relevant equipped play spaces should be a priority. Manor Farm Recreation Ground includes both equipped play and youth provision, as well as sports, offering play provision for a wider group of age ranges.

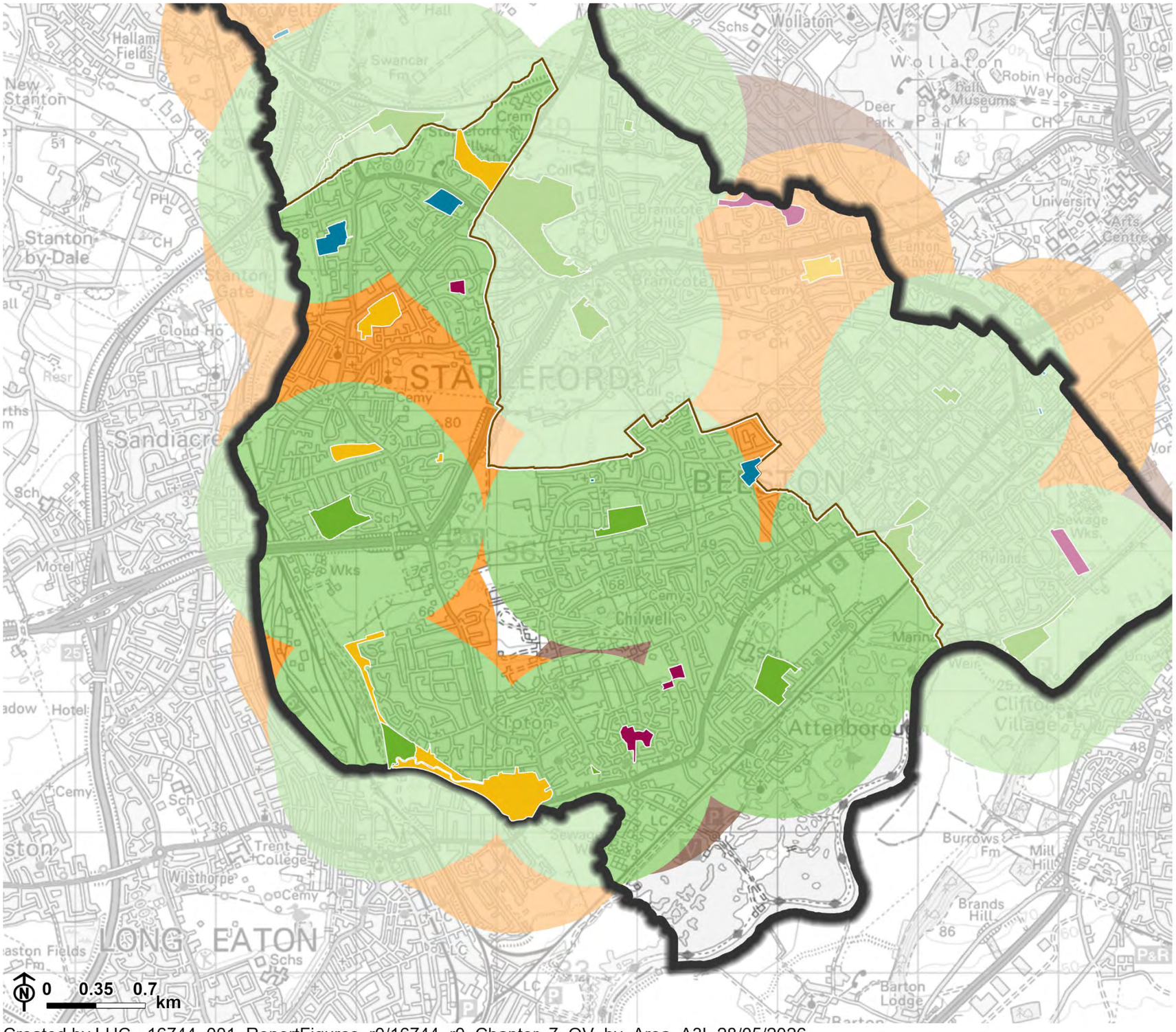
Figure 7.3: Access to high qualilty high value parks and play spaces in the southeast analysis area



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Figure 7.4: Access to high qualilty high value parks and play spaces in the southwest analysis area



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7.47 In the central part of Stapleford, access is to play and parks which do not meet the quality and value benchmarks. The access catchment around Hickings Lane Recreation Ground covers most of the residential areas within this gap. This space currently has a low quality and high value score. Improvements to the quality of this site can help address this gap in access.

Combined provision and combined needs

7.48 The final consideration to inform priorities for recommendations is understanding the overall need for play and current provision of play across Broxtowe. Two combined maps have been created to understand this.

7.49 The Play Needs Index has been prepared to highlight the overall need for play across Broxtowe. This tool combines:

- IMD Income Deprivation Affecting Children Index (IDACI);
- IMD Education, Skills and Training Deprivation Doman (Children and Young people sub-domain);
- Sport England Actives lives data for children and young people; and
- Child population (the % of population age 0 to 15).

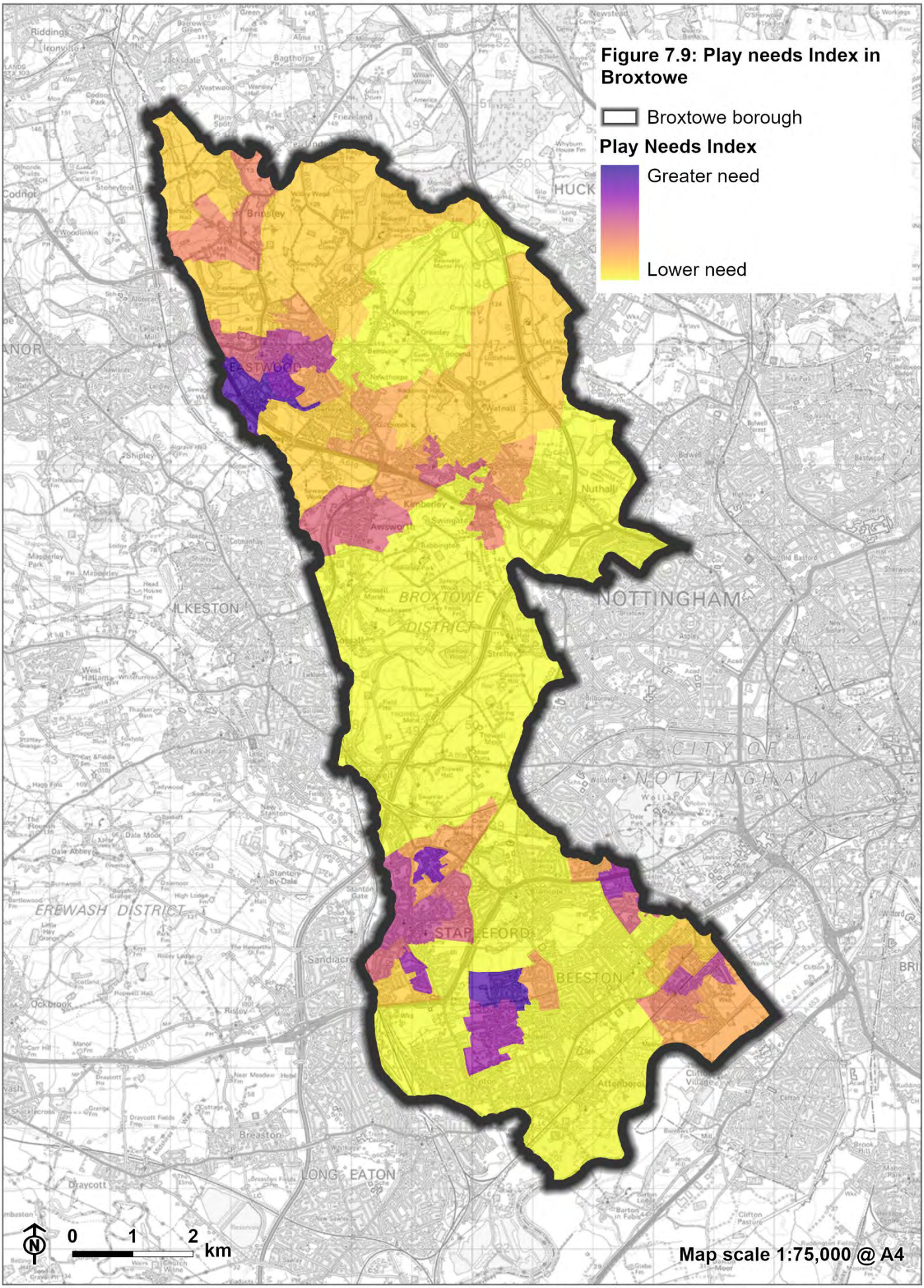
7.50 The findings of the Play Needs Index are shown in **Figure 7.9**. LSOAs demonstrating the highest need for play are located in Eastwood and Beeston Rylands. Other locations exhibiting relatively high play need include Stapleford and the northern part of Chilwell.

7.51 The Play Provision Index has been prepared to understand the overall provision of existing play across Broxtowe. This combines:

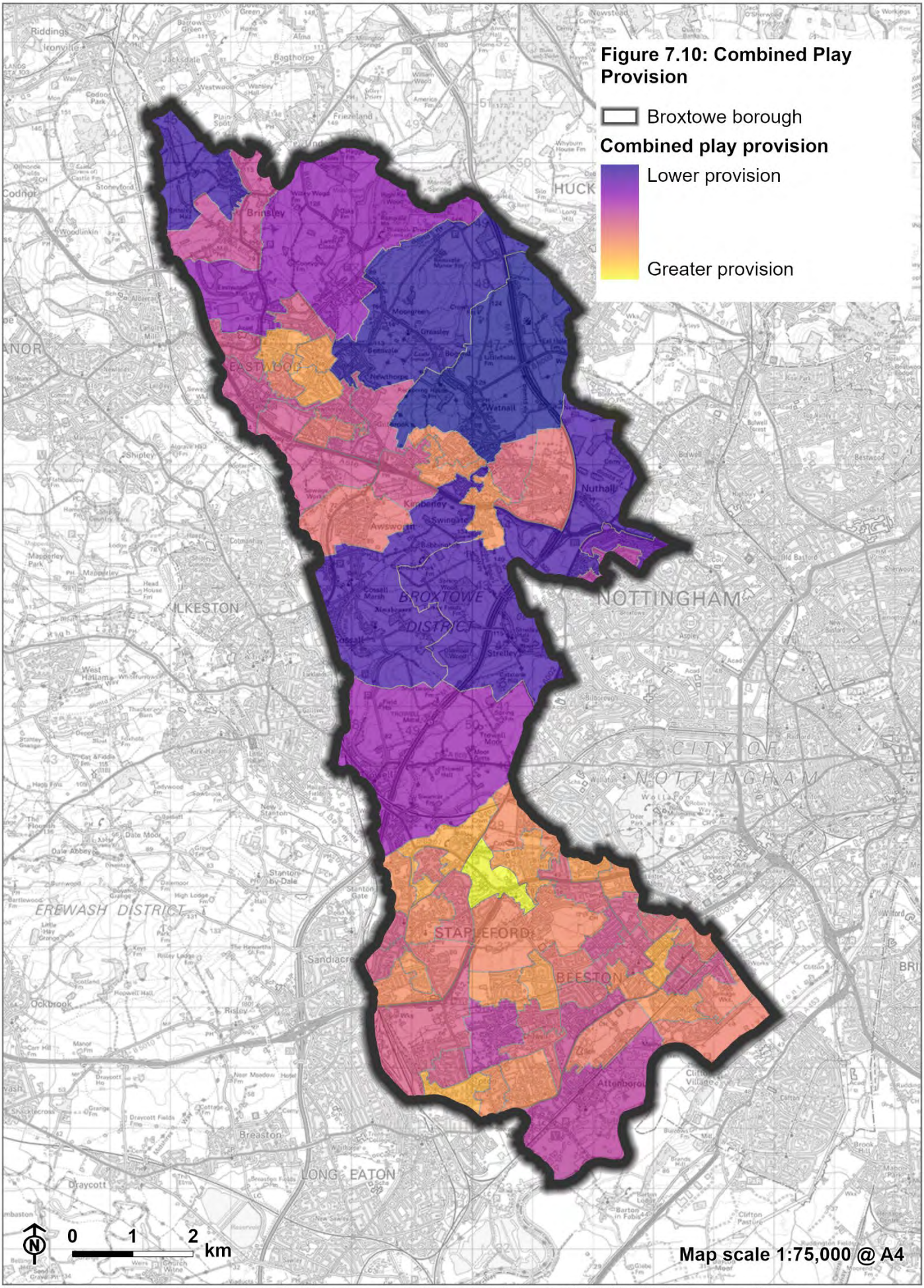
- The percentage area covered by each of the access buffers;
- The percentage of parks and play spaces within the local area (group of LSOAs which best fit current ward boundaries) which meet the quality and value scores; and
- Total quantity of parks and play spaces per 1,000 population within the local area.

7.52 The findings for the Play Provision Index are shown in **Figure 7.10**. LSOAs demonstrating the lowest current provision are mostly found in the more rural areas in the north of Broxtowe. This includes the north of Watnall and Awsworth. There is

also medium-high need in parts of Toton and Attenborough, Giltbrook and eastern Kimberly. The highest provision is around Bramcote.



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Priority parks to enhance

7.53 This section summarises the findings from this chapter and highlights priority sites to enhance. Where several spaces would help meet gaps to combined provision, access or combined needs, those which have greater play provision for all ages (i.e. spaces with NEAP and youth provision) have been prioritised. Additionally, spaces where there is the existing physical space to incorporate enhancements have been prioritised. These sites, along with Site 29 Bramcote Hills Park can also form candidate 'destination spaces' to introduce more challenging play, as well as additional features such as toilets. In the longer term, once investments are undertaken, these 'destination spaces' could expect to have a larger access catchment as people would likely be willing to travel further to reach these spaces.

7.54 A full list of potential recommendations for all play spaces is provided in **Appendix B**.

Site 1 Basil Russell Playing Fields

This site is located in Nuthall and has the opportunity to improve access to high quality and high value place space, where there is currently no access to this. In addition to overall quality improvements, enhancements should focus on the inclusive and community value of this space.

Site 3 Brinsley Recreation Ground

This is located in an area of low current provision and where there is currently no access to high quality and value play spaces. Priorities for enhancement include those that enhance the promote activity, as well as well-being and development.

Site 4 Coronation Park

Coronation Park is centrally located in Eastwood, an area of high play need and medium-high provision. This site has the potential to form a destination play space. Particular themes for enhancement include inclusive and community orientated and nature and climate positive.

Site 11 Smithurst Road Open Space

This space is located in an area that currently has no access to NEAPs or youth spaces. Increasing the play value of the wider Giltbrook Green area north of

Smithurst Road by introducing youth features and more equipped play could provide access within this gap.

Site 24 Shilo Recreation Ground

This space is located where there is currently only access to low quality and low value play spaces. Additionally, this is an area of medium-high play need. Enhancements for space should improve the quality and value, as well as improving value across all four themes.

Site 28 Beeston Fields Recreation Ground

This space is located in an area of relatively high play need and medium play provision. Currently, access around Beeston Fields Recreation Ground does not include access to high quality and high value spaces. Enhancements should focus on improving the overall quality, as well as helping to support well-being and development and improve provision for nature and climate resilience.

Site 37 Hetley Pearson Recreation Ground

The access catchment for this site covers areas of higher play need in Beeston Rylands. Additionally, this space is centrally located in areas where there is currently no access to parks and play spaces which meet the inclusive and community orientated, active and healthy and nature and climate positive themes. Enhancements should focus on these themes, as well as improving overall quality.

43 Hickings Lane Recreation Ground

This space is located in an area of medium-high play need and where there is currently no access to high quality and high value spaces. Enhancements should focus on improving inclusion and community orientation, creating active and healthy space, supporting nature and climate resilience, as well as improving overall quality.

44 Inham Nook Recreation Ground

This space provides equipped play and informal youth access to areas of high play need in the northwest of Chilwell. Enhancements should focus on promoting provision which supports well-being and development, as well as enhancing nature and climate-resilient features.

47 Manor Farm Recreation Ground

This space is located where the only access to high value and high quality space is to wider parks, with no dedicated play provision. This area is also close to areas of medium-low combined play provision. Additionally, it is located in areas which do not have access to parks which meet the benchmark for supporting well-being and development or nature and climate positive. Enhancements should focus on these themes as well as improving overall quality.

Additional play spaces

The need for additional play spaces is greatest within Cossall (for all ages). There is also a need for dedicated BMX areas around Watnall.

Chapter 8
Play infrastructure policies

A vision for play in Broxtowe

8.1 The following section sets out details of a potential play policy that could be adopted by Broxtowe Borough Council. The play policy comprises the following elements:

- A **vision** setting out what play provision in Broxtowe could look like in the future.
- A set of **delivery principles** which set the overarching approach to implementing play enhancements.
- A set of **design principles** which set out the priorities for play park design and what good play could look like.

Vision

8.2 Everyone in Broxtowe will have access to a variety of play experiences within a 10 minute walk (800 m) of their home. Play spaces will be managed and maintained to a high standard to ensure a consistency of provision for residents across Broxtowe.

Delivery Principles

8.3 The delivery principles focus on the key steps that will ensure successful delivery of new play spaces or enhancement projects.

- New play sites or enhancements should be planned at the neighbourhood scale, taking into account existing play provision and play need to ensure the appropriate play interventions are delivered in the right places.
  - Combined access mapping, play needs and play provision indexes should be considered to understand what new spaces or enhancements would be most appropriate.
  - Where play provision cannot be maintained to a high quality, it may be appropriate to consolidate play provision within a local area.
- All new play spaces and significant play enhancements should involve the local community, including children and young people.

- Consultation should focus on the wider play experience, rather than purely the type of fixed play equipment.
- Consultation should include innovative methods of activity to engage people early in the design process.
- Consultation should involve a wide-cross section of the community. This may include working with existing officers and groups with contacts across the community.
- Engagement should be cost effective by co-ordinating consultation with other community events or consultation.

- Cross team communication across Broxtowe Borough Council should be prioritised to allow an opportunistic approach to delivering play enhancements.
  - For example, where highways work is taking place on busy roads near parks, opportunities for introducing traffic calming measures and/or road crossings should be explored.
  - Design of new active travel should consider locations of parks and play spaces to promote active travel links to and between these spaces.
  - Works to parking areas within or adjacent to play and parks should incorporate additional disabled parking bays near play spaces.
  - Essential tree works within or adjacent to play and parks may provide material for natural play features which can be retained on site.

Design Principles

8.4 The design principles are intended to guide and inform the future design and layout of play and enhancements to existing sites. They could be used as part of a brief to a play equipment supplier or landscape designer. The principles could also act as a framework for reviewing design proposals for sites, to determine to what extent they meet the requirements set out in the policy.

Theme 1: Inclusive and community orientated

- Play spaces should cater for a wide range of needs and interests. Where there is capacity, play spaces should include provision for all ages, from 0 to 18.
- Equipment should be inclusive rather exclusive, offering opportunities for children of all abilities to play together.

- All new play spaces or significant play space enhancements should be delivered in consultation with local communities, including children and young people.
- All play spaces for children under 11 should also include provision for accompanying adults, including seating.
- Play spaces should be located to maximise accessibility for residents, including for wheelchairs and pushchairs.
- Play spaces should be free to use and welcoming for all, and not restricted to residents within a single housing development.

Theme 2: Active and healthy

- Where additional space for run-about or informal sport is not available, informal physical activity can be encouraged e.g. through signage or ground graphics e.g. hopscotch.
- Play spaces should be designed to maximise a variety of physical activities and movements, including climbing, balancing, strength building.
- Play spaces should be well sign-posted and connected to cycle and walking routes to promote active travel to the space.
- Where applicable, play spaces should include challenging equipment that allows children to experience age-appropriate risk.
- As far as possible, sports provision within parks should be free to use for informal play when not in formal use, with welcoming signage allowing this use.
- Provision of non-sport related physical activity for older children should be considered, including
- Play spaces should be located in safe environments, free from the impacts of noise or air pollution.

Theme 3: Supporting well-being and development

- Play should incorporate sensory play e.g. sand and waterplay or musical play alongside traditional play equipment.
- Parks should incorporate quiet contemplation spaces, including sensory gardens to support well-being and mental health.

- Local points of interest (including historical and natural features) should be interpreted through child-friendly signage, with suggestions for imaginative or discovery games.
- The use of playful signage and artwork should be incorporated into all spaces to offer self-led free play opportunities.

Theme 4: Nature and climate positive

- Recycled or durable natural materials should be the default material prioritised for play equipment and all safety surfacing.
- Design of all new play areas should ensure that there are shaded areas of play, either through tree planting or other sheltered areas.
- Design of all new play areas should explore whether there is the potential for Sustainable Drainage Systems (SuDS) to be integrated to prevent flooding or drainage issues on site.
- Within natural areas, signage, artwork and other informal structures should be introduced to encourage natural play.
- Natural play elements including falling logs and boulders should be incorporated in and around play spaces.

Additional considerations: Overall safety and management

- Play spaces should be signposted with welcoming and enticing signage, which include a no-dogs sign, contact number and QR code for reporting issues with the site.
- All play equipment must be compliant with EN1176/EN1177.
- Design for new play spaces should consider how spaces can be managed in the long-term.

Play standards for new development

Quantity standards

8.5 Current quantity of equipped and informal play is below the standard set by Fields in Trust. It is recommended that new development should ensure that the following standards are met. This will increase the overall provision of play spaces

within Broxtowe and ensure that play provision is focused close to where children live.

Residential development should provide the equivalent of 0.25 hectares of equipped play and 0.30 hectares of informal play space for every estimated 1,000 population anticipated to reside within the development. Exceptions may be made on a case-by-case basis where the new development is not expected to increase in child population. For example, student accommodation or dedicated residences for older residents.

Provision can be secured on-site or off-site. Where development is located close to strategic priorities, part of the contribution for play provision can be provided as an alternative to new play space. Where play provision is being delivered through enhancement to existing spaces, this should be sought through S106, at an amount equivalent to the cost of providing that amount of new space (based on up-to-date costing provided in the IDP).

Accessibility standards

8.6 With the exception of the 100 metres access buffer for equipped play (including LAPs), there is good access to play spaces in Broxtowe. This suggests the Fields in Trust play catchment standards, and 800 metres parks and play catchments are appropriate for the Broxtowe context. New development should plan play spaces with consideration of these catchment areas.

Any off-site provision of play spaces delivered through development should be located within the appropriate access catchment of the new development.

All development should be located within the access catchment area for at least one level of equipped play space and be within a 10-minute walking distance of a park of play space.

Development should also include some form of informal play on-site. This could include playful signage, sculptures or ground graphics.

Quality and value standards

8.7 It is important that new play spaces meet the expected quality and value standards expected in Broxtowe, and include provision that meets the Design

Principles for each of the four themes. This should be secured through the design of the play space and ongoing management and maintenance.

New play provision should be designed in consultation with local communities. A design statement for new play spaces should set out how space meets all the Design Principles.

Funding should be secured for the ongoing management and maintenance for the lifetime of the development. This could include contributions for the space to be managed by Broxtowe Borough Council. Where management and maintenance of the play space is being undertaken by another party, a management plan should be provided setting out how the space will be managed to ensure the quality and value of the space are secured long term.

Where provision of play space is through contributions to play enhancements or strategic off-site play spaces delivered by Broxtowe Borough Council, additional contributions should be provided to contribute to additional management requirements for these spaces.

Decision making tool

8.8 The following tool sets out considerations for deciding what play provision should be included within development. It can form a guidance tool for developers and Development Management planners.

Areas of higher need and lower provision

8.9 Developments in areas of high play need and low play provision are priority areas for new play spaces. Developments in these areas should provide new open spaces rather than offer enhancements to existing play spaces.

8.10 The following prioritisation list applies.

1. Where development is within the existing access catchments for some but not all play types, priority should be given to deliver play types that are not currently provided for.

2. Where development is within the existing access catchments for all play types, but only has some high quality and high value play types, priority should be given to deliver play types for which access is currently to lower quality and/or value spaces.

3. Where the development is not within any access catchments, priority should be given to provide multifunctional play spaces which offer a range of play functions for all ages. New spaces should prioritise play located so that it can also serve existing communities with limited access to play.

Areas of higher need and higher provision

8.11 Developments in areas of high need but high existing provision should ensure that existing play spaces are maximising their potential.

8.12 The following prioritisation list applies.

1. Where the development is within access catchments to informal wider spaces or LAP spaces only, provision for new LEAP, NEAP or youth spaces should be prioritised.

2. Where development is within existing access catchments to some play spaces with lower quality and value scores, enhancements to these spaces should be prioritised.

3. Where development is within access catchments which are all high quality and high value spaces, enhancements to off-site provision should focus on enhancements to meet any theme benchmarks which are not currently met.

4. Where the development is not within any access catchments, priority should be given to provide multifunctional play spaces which offer a range of play functions for all ages. New spaces should prioritise play located so that it can also serve existing communities with limited access to play.

Areas of lower need and lower provision

8.13 Developments in areas of low play need and low existing provision should prioritise provision of new play spaces.

8.14 The following prioritisation list applies.

1. Where development is within the existing access catchments for some but not all play types, priority should be given to deliver play types that are not currently provided for.

2. Where development is within the existing access catchments for all play types, but only has some high quality and high value play types, priority should be given

to deliver play types for which access is currently to lower quality and/or value spaces.

3. Where the development is not within any access catchments, priority should be given to provide multifunctional play spaces on site.

Areas of lower need and higher provision

8.15 Areas of low need but high existing provision have a lower priority for play. Developments in these areas should be planned to help increase provision and access to play in other areas.

8.16 The following prioritisation list applies.

1. Where development is within existing access catchments to some play spaces with lower quality and value scores, enhancements to these spaces should be prioritised.

2. Where development is within access catchments which are all high quality and high value spaces, enhancements to off-site provision should focus on enhancements to meet any theme benchmarks which are not currently met.

3. In some cases, off-site provision or enhancement to play could be provided outside of relevant access catchments to the new development, if it can be evidenced that there existing provision has the capacity to serve the development.

Developer checklist

- Has an estimation of population associated with the development been calculated to understand the quantity of play provision required?
- Have the play needs and play provision for the local area been understood and used to prioritise the play needs provided as part of the development?
- Where play contribution is being made through contributions to existing play enhancement or towards strategic off-site provision of play, has this been set out within a S106 agreement?
- Where play contribution is being designed and delivered as part of the development, has adequate consultation with communities been evidenced?

- Has a play design statement been set out which demonstrates how play provision will meet the Design Principles set out in this strategy?
- Have appropriate resourcing and financial contributions for ongoing management and maintenance of the play space been secured, including the need for replacement equipment when it reaches the end of its expected lifespan? .

Appendix A

Audit form

Open Space Audit - Play strategy

Site based assessment

Site ID:
Site Name:
Category of play:
Audit date and time:
Time spent surveying:
Survey site access (e.g. access to whole site/ access to part of site/ no access to site):
Is the site still a play space? If not, please describe below:

Value scores are highlighted in yellow

Quality scores are highlighted in green

1. Basic information

1.1	Which best describes the setting (Pick one)		
	Stand along playground (formal / equipped play)	☐	
	Playground within wider park / open space (formal / equipped play)	☐	
	Informal play within wider setting	☐	
1.2	What type of space are included? (multiple choice)		
	Local Area of Play (LAP)	☐	
	Local Equipped Area of Play (LEAP)	☐	
	Neighbourhood Equipped Area of Play (NEAP)	☐	
	Designated youth / informal play space e.g. MUGA	☐	
	Other informal play space	☐	
1.3	Which age groups are provided for? (multiple choice)		
	0 - 5	☐	0 or +1
	5 - 8	☐	0 or +1
	8 - 11	☐	0 or +1
	11+	☐	0 or +1

2. Inclusive and community orientated I: Arrival and location

2.1	Informal oversight	☐	+1-5
2.2	Well used by children	☐	+1-5
2.3	Getting there (access to the site/barriers etc.)	☐	+1-5
2.4	Getting there for those with impairments or with buggies and pushchairs (including appropriate parking / drop-off)	☐	+1-5
2.5	Meeting other children	☐	+1-5
2.6	Is the space fenced?	☐	
2.7	Seating for adults	☐	0 or +1-2
2.7a	Condition	☐	NA or +1-5
2.8	Seating for children	☐	0 or +1-2
2.8a	Condition	☐	NA or +1-5
2.9	Seating for teenagers / teen shelter	☐	0 or +1-2
2.9a	Condition	☐	NA or +1-5
2.10	Toilets/changing facilities	☐	0 or +1-2
2.10a	Condition	☐	NA or +1-5
2.11	Any other features for supervisory adults on site	☐	0 or +1
2.12	Any evidence of provision for staffing or organised play activity on site	☐	0 or +1

3. Active and healthy I: Specific play affordances

3.1	How many separate items of equipment	☐	
3.2	Balancing	☐	0 or +1
3.3	Rocking	☐	0 or +1
3.4	Sliding	☐	0 or +1
3.5	Climbing	☐	0 or +1
3.6	Rotating	☐	0 or +1
3.7	Jumping	☐	0 or +1
3.8	Viewing	☐	0 or +1
3.9	Loose parts	☐	0 or +1
3.10	Crawling / hiding	☐	0 or +1

3.11	Swinging	☐	0 or +1
3.12	Agility	☐	0 or +1
3.13	Strength	☐	0 or +1

4. Active and healthy II: Other opportunities for activity

4.1	Playground	☐	0 or +1-2
4.1a	Condition	☐	NA or +1-5
4.2	MUGA	☐	0 or +1-2
4.2b	Condition	☐	NA or +1-5
4.3	Wheels park	☐	0 or +1-2
4.3a	Condition	☐	NA or +1-5
4.4	BMX track	☐	0 or +1-2
4.4a	Condition	☐	NA or +1-5
4.5	Outdoor gym	☐	0 or +1-2
4.5a	Condition	☐	NA or +1-5
4.6	Informal play elements	☐	0 or +1-2
4.6a	Condition	☐	NA or +1-5
4.7	Grass pitches	☐	0 or +1-2
4.7a	Condition	☐	NA or +1-5
4.8b	Informal kickabout	☐	0 or +1-2
4.8a	Condition	☐	NA or +1-5
4.9	Artificial pitches	☐	0 or +1-2
4.9a	Condition	☐	NA or +1-5
4.10	Tennis courts	☐	0 or +1-2
4.10a	Condition	☐	NA or +1-5
4.11	Promoted / measured walking / jogging routes	☐	0 or +1-2
4.11a	Condition	☐	NA or +1-5
4.12	Water activities (outside play areas)	☐	0 or +1-2
4.12a	Condition	☐	NA or +1-5
4.13	Bowls	☐	0 or +1-2
4.13a	Condition	☐	NA or +1-5
4.14	Connected to an active travel roues	☐	0 or +1-2
4.14a	Condition	☐	NA or +1-5
4.15	Other	☐	0 or +1-2
4.15a	Condition	☐	NA or +1-5

5. Active and healthy III: Safety, care and maintenance

5.1	Well maintained (overall condition of play equipment, litter)	☐	+1-5
5.2	Sense of safety and security (lighting etc.)	☐	+1-5
5.3	Impact absorbing surfacing	☐	0 or +1
5.3a	Condition	☐	NA or +1-5
5.4	Litter bins	☐	0 or +1
5.4a	Condition	☐	NA or +1-5
5.5	Play area notice stating dog free, children only, emergency contacts	☐	0 or +1-2
5.6	No smoking sign	☐	0 or +1
5.7	Cycle/scooter parking	☐	0 or +1
5.7a	Condition	☐	NA +1-5
5.8	Car parking	☐	
5.9	Are any pedestrian gates self closing	☐	0 or +1

6. Inclusion and community-orientated II: Added play value

6.1	Is arrival at the play space easy for wheelchairs and pushchairs?	☐	0 or +1 - 2
6.2	Is moving through the play space accessible for all, including wheelchairs and pushchairs?	☐	0 or +1 - 2
6.3a	Is there inclusion of play opportunities for children with disabilities	☐	0 or +1 - 2

6.3b	Do these allow for children of all abilities to play together?	☐	+1-5
6.3c	Condition of disabled play equipment?	☐	NA or +1-5
6.4	Are there any other features which encourage play for diverse groups, including neurodiversity and special needs	☐	0 or +1 - 2
6.4a	Condition	☐	NA or +1-5
6.5	To what extent are play needs of different ages met?	☐	+1-5
6.6	To what extent does the park encourage social play?	☐	+1-5
6.7	To what extent does the park encouragi~~ng~~ teenage play?	☐	0 or +1-2
6.8	Are there any features / equipment which are aimed at teenage girls?	☐	0 or +1-2
6.8a	Condition	☐	NA or +1-5
6.9	Is there a teen shelter?	☐	0 or +1
6.9a	Condition	☐	NA or +1-5

7. Wellbeing and development: Added play value

7.1	To what extent does the space entice children to play?	☐	+1-5
7.2	To what extent does the space encourage social play?	☐	+1-5
7.3	To what extent does the space allow for imaginative play?	☐	+1-5
7.4	To what extent does the space offer challenging/exciting play (overall added play value)?	☐	+1-5
7.5	To what extent are there opportunities for learning within play	☐	+1-5
7.6	To what extent are there opportunities for sensory play e.g. sand or water play	☐	+1-5
7.7	Inclusion of sounding items	☐	
7.8	Inclusion of ground graphics	☐	0 or +1-2
7.9	Overall condition of additional play features (e.g.sounding items, ground graphics, sensoryplay features, educational play features?	☐	NA or +1-5
7.10	Overall visual appeal	☐	+1-5
7.11	To what extent does the overall layout provide a clutter free space, including offering calmer / quieter spaces?	☐	+1-5

8. Climate and nature-positive: Added play value

8.1	To what extent does the space provide access to the natural environment?	☐	+1-5
8.2	To what extent does play allow children to connect with nature?	☐	+1-5
8.3a	Does play incorporate sustainable or natural materials?	☐	0 or +1-2
8.3b	Do safety surfaces include natural materials?	☐	0 or +1
8.4	Overall condition and management of natural play features?	☐	NA or +1-5
8.5	Are there any sustainable drainage features or other materials which provide resilience in times of flooding / high rainfall?	☐	0 or +1-2
8.6	Is there shading and natural surfaces which create resilience to heatwaves?	☐	0 or +1-2
8.7	To what extent does ground contouring create a natural and playful landscape?	☐	+1-5
8.8	Is play equipment designed for the site and suitable for the local landscape?	☐	+1-5
8.9	Are there any additional features which create space for nature e.g. bug hotel, bird box, bat box?	☐	0 or +1-2
8.10	Overall condition and management of natural features?	☐	NA or +1-5

Appendix B
Recommended actions per site

1. Basil Russell Playing Fields

Quick facts:

- Located in north analysis area (Nuthall)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for themes 1 – 3
- Strategic priority to enhance

Recommended actions:

- Introduce additional entry points into fenced play area and, in line with community consultation, replace high fences with lower barriers.
- Reseeding of grass under play equipment
- Remove old and worn benches and replace where required.
- Widen the path from the car park to the play area, with adequate rest spaces and passing points between the carpark and disabled play provision.

2. Beauvale Recreation Ground

Quick facts:

- Located in the north analysis area (Eastwood)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and lower value score
- Meets the benchmark score for theme 2

Recommended actions:

- Introduce a surfaced path and possible new entry point from the car park directly to the play space and inclusive-use basket swing.
- Repaint chipped paint on play equipment.
- Install welcoming signage for playground, recommending the space is dog free, proving and emergency contact and encouraging children to play.
- Consider incorporating spaces to encourage teen play, including teenage girls, such as social seating located close to the trim trail to create a youth zone.

3. Brinsley Park Recreation Ground

Quick facts

- Located in the north analysis area (Brinsley)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for theme 1
- Strategic priority to enhance

Recommended actions:

- Refresh paint on the MUGA and repaint chipped paint within outdoor gym equipment and benches
- Install inclusive picnic bench within picnic table area, connected to the pathway.
- Widen footpath to ensure width is appropriate for wheelchair users between car park and picnic area (and past play provision).
- Repair broken timber dragonfly and encourage use of this and other timber animals for imaginative play and seating through signage.
- Consider utilising (flat built platform) as a performance area or social area for teenagers (designed with community consultation).
- Over time, as disabled swing reaches the end of its life replace with more inclusive equipment.
- Introduce new welcoming signage for the playground.

- Explore opportunities for allowing toilets on site to be open to the public.

4. Coronation Park

Quick facts:

- Located in north analysis area (Eastwood)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and higher value score
- Meets the benchmark score for themes 2 and 3
- Strategic priority to enhance

Recommended actions:

- Consider upgrading sand play area to a raised sandpit with a ledge, increasing use for wheelchair users and reducing risk of sand spilling over into the rest of the play site.
- Introduce social seating around the skate park to increase social use of this space.
- Consider introducing features for nature such as bug hotel or bird boxes within treed areas, with child-friendly, playful signage educating children about the flora and fauna on site.

5. Flixton Road open space

Quick facts:

- Located in north analysis area (Kimberley)
- Space includes LEAP equipped play
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Introduce welcoming signage at entrances to the site, including from Chilton Drive and Flixton Road.
- Clean graffiti from existing signage and introduce child-friendly playful educational signage about the Old Kimberley Train Bridge and wildlife within Kimberley Railway Cutting SSSI to promote imaginative play.
- Repainting fencing around play area and faded timber equipment.
- Consider opportunities for social seating or sculptures which reflect railway heritage and encourage social and imaginative play.
- Explore the opportunity of opening part of nature reserve (now locked) and providing playful educational opportunities to engage children with natural value of the site, ensuring the impact of this on wildlife and status of adjoining SSSI is assessed and managed.

6. Hall-Om-Wong Open Space

Quick facts:

- Located in north analysis area (Kimberley)
- Space includes NEAP equipped play and informal / youth space.
- Lower quality and higher value score
- Meets the benchmark score for themes 2 and 4

Recommended actions:

- Upgrade bins within the site
- Consider opportunity to engage young people in creating a mural within the skate park areas and resurface minor area within skate park where the surface is damaged.
- Introduce playful scavenger hunt or trail signage and mini sculptures within woodland area, educating children on local flora and fauna.

7. Jubilee Park

Quick facts:

- Located in north analysis area (Eastwood)
- Space includes LEAP equipped play
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Remove graffiti from children's seating area and remove litter from fenced-off treed area and work with communities and explore opportunities for signage or CCTV to prevent littering and graffiti on-site.
- Introduce surfaced path to inclusive picnic table and basketball swing to promote use for all users.
- Introduce additional seating under shaded areas.

8. Knowle Park Open Space

Quick facts:

- Located in north analysis area (Kimberley)
- Space includes NEAP equipped play and informal / youth space.
- Higher quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Ensure that where equipment has been removed this has been safely done and remaining infrastructure does not create a trip hazard, including for visually impaired users.
- Clean graffiti present on benches and play equipment.
- Introduce surfaced path to disabled play equipment.

- Introduce more extensive signage and seating around small bmx track and repair missing sign posts.
- Explore opportunities to introduce signage and structures within treed areas to encourage informal nature play within these areas, whilst ensuring adequate safety measures are in place.

9. Mansfield Road Recreation Ground

Quick facts:

- Located in north analysis area (Eastwood)
- Space includes NEAP equipped play.
- Higher quality and higher value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Introduce herbaceous planting and low shrubs adjoining fenced play area to avoid area of bare ground where grass area meets playground.
- Reseed of grass areas around trees and introduce perennial wildflower bulbs.
- Introduce seating around Covid-10 Tree rainbows or flower bed of remembrance to create a calm space for children and adults for quiet contemplation.
- Explore opportunities for larger more challenging equipment, in keeping with setting close to memorial garden to improve offering for older children.

10. Millfield Road Open Space

Quick facts:

- Located in north analysis area (Kimberley)
- Space includes LEAP equipped play
- Lower quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Repair and maintain windmill themed artwork.
- Safeguard integrity of windmill ruin and explore opportunities to restore this to create a safe space for children to explore and engage in informal imaginative play (without threatening heritage value of this).
- Repaint entry posts from adjoining Millfield Road and upgrade welcoming signage at all entrances.
- Explore opportunities for establishing a signed, accessible entry route from Eastwood Road, with blue badge parking or drop off point. Seating along this route should be provided to provide rest stops.
- Consider moving goal post to reduce conflict with Windmill ruins and reduce visual impact on the heritage feature.
- Ensure management of natural vegetation within fenced area.

11. Smithurst Road Open Space

Quick facts:

- Located in north analysis area (Giltbrook)
- Space includes LEAP equipped play
- Higher quality and higher value score
- Does not meet the benchmark score for any theme
- Strategic priority to enhance

Recommended actions:

- Introduce wayfinding signage to reinforce connection between play space and wider natural area to the north of Smithurst Road.
- In the long term, explore opportunities for restoration of the brook, including vegetation for filtering. In line with appropriate safe conditions of the brook, explore opportunities for signage and informal play elements to connect children to this natural asset.
- Replace benches with social seating, encouraging use for older children.

- Explore opportunities for introducing a wider range of equipped play and youth provision for older children north of Smithurst Road, designed for the local landscape.

12. Nuthall Spinney

Quick facts:

- Located in north analysis area (Nuthall)
- Space includes LEAP equipped play
- Higher quality and lower value score
- Does not meet the benchmark score for any theme.

Recommended actions:

- Introduced a ramped, surfaced entry path to provide access from the road up into the space.
- There is the potential to introduce play in the nature area on the wooded hill, maximising the natural contouring. Assessment of safety issues associated with the slope and impact on wildlife would need to be assessed.
- Explore the opportunity to introduce a picnic or seating area in the east of the site, to offer a quieter space away from the equipped play area.

13. Watnall Spinney Open Space

Quick facts:

- Located in north analysis area (Watnall)
- Wider informal play space
- Lower quality and higher value score
- Meets the benchmark score for theme 1

Recommended actions:

- Explore opportunity to establish a smaller official bmx track within a less sensitive (for wildlife) part of Watnall and manage access of bikes to this site.

- Repair perimeter fencing around the wider park area.
- Ensure management of vegetation within locked area does not encroach into the site.
- Introduce ramped entry to site to improve accessibility for wheelchairs and pushchairs to the southern part of the site and include benches within this area.
- Introduce a trail or signage challenging children to find the playful timber statues throughout the site and consider introducing playful and educational signage in collaboration with local children to connect them to the natural areas within the site.

14. Watnall Green

Quick facts:

- Located in north analysis area (Watnall)
- Wider informal play space
- Higher quality and lower value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Explore opportunity to establish a smaller official bmx track within a less sensitive (for wildlife) part of Watnall and manage access of bikes to this site.
- Restore eroded banks damaged by bike access.
- Introduce signage, including playful, child friendly signage, helping to connect children with the wildlife and plant species on site.
- Explore introduction of informal bouldering or deadwood logs for balancing and scrambling, as well as natural seating.
- Assess which gates can be accessible and if any gates need to be locked include wayfinding signage directing users to the nearest useable entrance.

15. The Stag Recreation Ground

Quick facts:

- Located in north analysis area (Kimberley)
- Space includes NEAP equipped play
- Lower quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Remove graffiti from play equipment and work with communities and explore opportunities for signage or CCTV to prevent littering and graffiti on-site.
- Replace pedestrian gates to play site to ensure these are self closing.
- Introduce welcoming signage along Noel Street and Nottingham Road to welcome users to the site.
- Introduced a surfaced path

16. Hall Park

Quick facts:

- Located in north analysis area (Eastwood)
- Space includes informal / youth space.
- Higher quality and lower value score
- Does not meet the benchmark scores for any theme.

Recommended actions:

- Introduce inclusive equipment suitable for disabled children, such as an accessible climbing frame
- Introduce signage within path network through wooded area to inform wheelchair and pushchair users which routes have steps.
- Replace damaged artificial surfacing on car racing track to be a more resilient surface, including opportunities for permeable paving.

- In consultation with the community, explore interest in re-purposing one of the model car racing tracks into a BMX track or similar.

17. Brinsley Headstocks

Quick facts:

- Located in north analysis area (Brinsley)
- Wider informal play space
- Lower quality and higher value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Introduce signage within path network through wooded area to inform wheelchair and pushchair users which routes have steps.
- Explore opportunities for child-friendly signage offering a trail through the space with natural features for children to identify.
- Explore opportunities for additional timber or other natural sculptures to add interest for children within the site.
- Explore opportunities to reinstate fenced off areas e.g. around the well.

18. Greasley Recreation Ground

Quick facts:

- Located in north analysis area (Eastwood)
- Space includes informal / youth space.
- Higher quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Improve condition of grass pitches, including reseeding grass areas by goal posts (and putting in more durable artificial grass surface if required), removing net and repainting goal posts.
- Explore opportunities for additional youth provision alongside the trim trail to create a space for teenage girls. This may include performance space or large social swings.
- Explore need for and possibility of introducing a crossing point along Lower Beauvale Road to increase access from residential roads to the south.
- Explore opportunities to introduce trails along the brook and in woodland areas to prevent erosion.
- Where this can be done safely, explore opportunities for gravel banked areas offering safe access to shallow parts of the brook for paddling.

19. College Way Open Space

Quick facts:

- Located in central analysis area (Nottingham edge)
- Space includes LEAP equipped play
- Higher quality and lower value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Repair pedestrian gate to ensure self-closing mechanism works.
- Explore opportunities to introduce seating away from the playground to offer a quieter space for children and adults.
- Introduce herbaceous and scrub planting to add visual appeal and improve connectivity to nature.
- For any locked gates, include wayfinding signage directing users to the nearest useable entrance.

20.The Lane Recreation Ground

Quick facts:

- Located in central analysis area (Awsworth)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and lower value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Replace the teen shelter with social hang out space designed with local young people, including teenage girls.
- Explore opportunities for tree planting on the boundary between the equipped play area and the cricket pitch to offer shading.

21. Redbridge Drive Open Space

Quick facts:

- Located in central analysis area (Nottingham edge)
- Space includes NEAP equipped play
- Higher quality and lower value score
- Does not meet the benchmark scores for any theme

Recommended actions

- Explore opportunities to replace grass pitch with an artificial surfacing which is more resilient to frequent use.
- Repaint worn benches.
- Introduce welcoming signage from Perivale Close, Redbridge Drive and Coxley Gardens.
- Introduce an additional entry gate into the play area.
- Introduce seating such as picnic tables or benches away from the play area as a quieter alternative space for hanging out or resting.

22. Festival Hall

Quick facts:

- Located in central analysis area (Trowell)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and lower value score
- Meets the benchmark scores for theme 3

Recommended actions:

- Explore opportunities for expanding provision of equipment for disabled equipment.
- In the longer term, seek opportunities to redesign the space to reduce clutter and create quieter areas and zones of play equipment.

23. Trowell Park Open Space

Quick facts:

- Located in central analysis area (Trowell
- Space includes LAP equipped play
- Higher quality and higher value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Introduce benches to provide rest spaces along the active travel routes which pass through the space.
- Introduce welcoming and enticing signage for the play space, and redirect users to nearest space for football (as this is not allowed in the play space).

24. Shilo Recreation Ground

Quick facts:

- Located in central analysis area (Awsworth)
- Space includes NEAP equipped play
- Lower quality and lower value score
- Does not meet the benchmark scores for any theme
- Strategic priority to enhance

Recommended actions:

- Introduce new safety surfacing around play equipment such as bark chipping where grass is currently worn away.
- Introduce sustainable drainage solutions around play equipment to ensure play space remains usable during wetter periods.
- Explore potential for introducing a surfaced, permeable path and introduce signage so users know which routes include steps and are not accessible for wheelchairs or pushchairs.
- Introduce playful signage and sculptures to create trails within the woodland area and encourage social and imaginative play.
- Remove remains of old house and explore options for safe natural play opportunities within woodland e.g. den building.
- Introduce welcoming signage within the play space, including providing an emergency contact for the site and stating that dogs should not be in the play area.

25. Pitt Lane

Quick facts:

- Located in central analysis area (Trowell)
- Wider informal play space
- Higher quality and higher value score

- Meets the benchmark score for theme 4

Recommend actions:

- Introduce inclusive picnic tables adjacent to surfaced pathways.
- Explore opportunities for designated and/or surfaced safe entry points to paddle in the stream or view the river to minimise erosion along the banks.
- introduce signage so users know which routes include steps and are not accessible for wheelchairs or pushchairs.

28. Beeston Fields Recreation Ground

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for themes 1 and 2
- Strategic priority to enhance

Recommended actions:

- Repaint equipment with chipped pain and explore opportunities to replace old equipment.
- Repair pedestrian gates to play area to ensure all self-closing mechanisms are working.
- Replace the surfacing on the football goal portion of the MUGA.
- Replace welcoming signage into the play space, including providing safety information and encouraging children to play.
- Explore opportunity for space for a wall mural, allowing children and young people a creative outlet within an appropriate and supervised space.
- Consider introducing a ramp at the northern access gate to the equipped play area to ensure there is accessible entry to the space from close to accessible parking bays.

29. Bramcote Hills Park Woodland

Quick facts:

- Located in southeast analysis area (Bramcote Hills)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and higher value score
- Meets the benchmark score for all themes

Recommended actions:

- Move accessible parking bays to the eastern edge of the carpark so they are located close to the equipped play area.
- Replace worn trim trail equipment.

30. Broadgate Park

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and higher value score
- Meets the benchmark score for themes 1 and 3

Recommended actions:

- Repaint cricket stumps and markings within MUGA
- Consider upgrading sand play area to a raised sandpit with a ledge, increasing use for wheelchair users and reducing risk of sand spilling over into the rest of the play site.
- Explore opportunity to create playful nature area within disused bowling green.
- In consultation with the local community, explore opportunity for signage to enhance use of pavilion as a performance area or hang-out space for teenage girls.

31. Dovecote Park

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes NEAP equipped play
- Higher quality and higher value score
- Meets the benchmark score for theme 3

Recommended actions:

- In consultation with the local community, explore the opportunity for including social seating within the bandstand to create a quieter space to socialise.
- Introduce infrastructure to support e-bike hire area and make this a more coherent use within the space.
- Explore opportunities for introducing shading around the play area.
- Explore the need for Blue Badge parking bays on Dovecote Lane to increase access for all to the site.

32. Eastcote Avenue Open Space

Quick facts:

- Located in southeast analysis area (Bramcote Hills)
- Space includes LEAP equipped play
- Higher quality and higher value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Install welcoming signage stating that the play area is dog free and providing an emergency contact number.
- In consultation with the local community, install local artwork or other features to encourage imaginative play.

33. King George's Park

Quick facts:

- Located in southeast analysis area (Bramcote)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Does not meet the benchmark scores for any theme

Recommended actions:

- Extend surfaced path to link to the inclusive picnic bench.
- Upgrade of benches in the south of the site.
- Explore the opportunity for herbaceous planting and scrub borders around equipped play areas.
- Introduce social seating next to the outdoor gym equipment to create a youth space.
- Introduce playful signage encouraging use of woodland areas for informal and natural play.

34. Leyton Crescent Recreation Ground

Quick facts:

- Located in southeast analysis area (Beeston-Rylands)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and lower value score
- Meets the benchmark score for theme 3

Recommended actions:

- Refresh paint on MUGA surface and replace basketball posts.
- Explore opportunities for alternative safety surface to sand, or preventative interventions which stop sand being spread across the play site.

- Re-seed grass under goalposts and consider introducing alternative surfaces that can withstand frequent use.
- Introduce seating in the south of the site to create a quiet space.

35. Sandy Lane Nature Reserve

Quick facts:

- Located in southeast analysis area (Bramcote Hills)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and lwoer value score
- Does not meet the benchmark score for any theme

Recommended actions

- Improve surfacing of path to access the play space from Markham Road.
- In the long term, seek to replace play equipment with timber play which is more in keeping with the natural setting of the nature reserve.
- Explore opportunities for trails for all ages to learn about and explore the nature reserve, including with adventure trim trail equipment.
- Introduce additional seating, including inclusive picnic tables.

36. Weirfield Recreation Ground

Quick facts:

- Located in southeast analysis area (Beeston Rylands)
- Wider informal play space
- Higher quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Introduce child-friendly educational signage about the natural and cultural heritage of the adjoining River Trent and Canal.

Explore the opportunity to install informal play or trim trail equipment on the perimeter of grass pitches, including utilising natural ground contouring to enhance this.

37. Hetley Pearson Recreation Ground

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes NEAP equipped play
- Higher quality and higher value score
- Does not mee the benchmark score for any theme
- Strategic priority to enhance
- Strategic priority to enhance

Recommended actions:

- Replace signage to the play equipment, including introducing welcoming signage.
- Explore opportunities to increase the provision of accessible and inclusive play equipment.
- Seek opportunities to increase runoff into the SuDS area to raise river level.
- Introduce additional benches to create rest stops on the path from the car park area to the equipment play and picnic benches.
- Liaise with local football clubs to explore the options of allowing informal football on some of the grass pitches.

38. Templar Road

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes LAP equipped play
- Higher quality and lower value score

- Does not meet the benchmark score for any theme

Recommended actions:

- In consultation with local residents, establish whether this is a suitable play space to offer opportunities for all local children (given close proximity to neighbouring residences).
- Introduce a ramp to improve access over the curb.
- Introduce welcoming signage encouraging children to play.
- Explore opportunity for additional play equipment.

39. Archers Fields Recreation Ground

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes informal / youth space
- Higher quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Refresh surface painting for the MUGA and to cover graffiti within the teen shelter.
- Explore opportunities for wider access points which do not limit use for wheelchairs and pushchairs, whilst still restricting access to motorbikes.
- Opportunity to introduce informal play elements which make use of natural contouring within the site.
- Opportunity to include playful signage woodland area.

40. Cator Lane Park

Quick facts:

- Located in southwest analysis area (Chilwell)

- Space includes NEAP equipped play and informal / youth space
- Higher quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Replace MUGA, with new grass pitch and teenage provision (in consultation with the local community).
- Introduce herbaceous planting and shrubs around border of equipped play.
- Reseed grass areas and create areas of wildflower.
- Replace or repaint worn benches.

41. Central Avenue

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes LEAP equipped play
- Lower quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Explore opportunities for introducing more play equipment for 5 – 8 year olds.
- Reseed grass area under goal post and consider installing an artificial surface resilient to high frequency of use.
- Clear weeds and introduce herbaceous planting and shrub along park borders to improve visual appeal.
- Consider need for lighting to increase sense of safety in the site.

42. Chetwynd Road

Quick facts:

- Located in southwest analysis area (Chilwell)
- Space includes NEAP equipped play
- Lower quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Ensure all lighting within the park is working.
- Refresh peeling and chipped paint on play equipment.
- Introduce picnic area

43. Hickings Lane Recreation Ground

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for themes 2 and 3
- Strategic priority to enhance

Recommended actions:

- Replace rusting picnic benches and incorporate additional inclusive picnic bench accessed by a path.
- Reseed grass areas around the equipped play area.
- Introduce additional natural informal play elements such as bouldering rocks or timber sculptures within treed picnic area.
- Explore opportunities for additional youth provision to complement existing outdoor gym equipment.

44. Inham Nook Recreation Ground

Quick facts:

- Located in southwest analysis area (Chilwell)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and higher value score
- Meets the benchmark score for themes 1 and 2
- Strategic priority to enhance

Recommended actions

- Refresh paint on MUGA surface.
- Introduce playful signage to encourage imaginative play based on the 'old ghost house' local folklore and timber sculpture.
- Explore opportunities to increase inclusive play opportunities.
- Introduce cycle track within site to improve safety for pedestrians.
- Explore opportunities for a BMX track within the disused bowling green, creating a dedicated space for riding.

45. Judson Avenue Open Space

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes LEAP equipped play
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Refresh bark chippings to ensure appropriate safety surfacing is in place.
- Remove old benches and replace as required.

- Consider opening the locked nature area and explore interest for community management of this space.

46. Long Lane Recreation Ground

Quick facts:

- Located in southwest analysis area (Attenborough)
- Space includes NEAP equipped play
- Higher quality and higher value score
- Meets the benchmark score for theme 3

Recommended actions:

- In consultation with on site Park Bistro, seek opportunities for formalising use of car park for all visitors to the open space (or offer Blue Badge parking to provide accessible parking spaces).
- Seek opportunities to expand park are and improve provision for older children, including large basket swings.

47. Manor Farm Recreation Ground

Quick facts:

- Located in southwest analysis area (Toton)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for themes 1 and 2
- Strategic priority to enhance

Recommended actions:

- Refresh bark chippings to ensure appropriate safety surfacing is in place within fenced equipped play area.
- Introduce safety surfacing under stand-alone climbing net.

- Upgrade MUGA, working in consultation with local young people to understand if alternative youth provision would be preferred.
- Consider introducing a new inclusive sensory play space within part of the disused bowling green to create an accessible play are close to on-site parking.
- Replace old seating adjacent the river banks.

48. Pasture Road Recreation Ground

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and lower value score
- Meets the benchmark score for them 2

Recommended actions:

- Explore opportunities for keeping the car park open when football is not on to allow use of accessible parking bays for accessing the play space at all times.
- Explore the need for passing spaces on raised surfaced path to allow wheelchairs or pushchairs to pass each other.
- Explore opportunities for resilient, permeable surfaces alongside the skate ramp where grass is worn away.
- Introduce social seating adjacent to skate park or outdoor gym area.

49. Queen Elizabeth II Park

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and higher value score
- Meets the benchmark score for theme 3

Recommended actions:

- Clean offensive graffiti within park.
- Replace broken basket swing, or remove pole and surfacing associated with this.
- Ensure adequate cover of bark chipping to form appropriate safety surfacing.
- Refresh paint on MUGA surface.
- Introduce social seating adjacent to outdoor gym area to create a youth zone.
- Re-seed grass under goalposts and consider introducing alternative surfaces that can withstand frequent use.

50. Sherman Drive Open Space

Quick facts:

- Located in southwest analysis area (Attenborough)
- Space includes NEAP equipped play and informal / youth space
- Lower quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Replace old and worn equipment.
- Repaint peeling and chipped paint on fencing around equipped paly area.
- Re-seed grass under goalpost around tree area.
- Introduce areas of planting around treed areas and consider opportunities for bug hotel to engage children in nature.
- In consultation with local communities, consider replacing MUGA in the east of the site and creating a 'youth zone' away from children play equipment.

51. Swinney Way Open Space

Quick facts:

- Located in southwest analysis area (Toton)
- Space includes LEAP equipped play
- Higher quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Introduce features for nature, such as a bug hotel and include playful signage to engage children with the natural environment.
- Introduce seating for children.

52. Ilkeston Road Recreation Ground

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes NEAP equipped play and informal / youth space
- Higher quality and lower value score
- Meets the benchmark score for theme 2

Recommended actions:

- Ensure adequate cover of bark chipping to form appropriate safety surfacing.
- Introduce social seating around outdoor gym equipment
- Repaint lines, reseed grass under goalposts and repaint goal posts within grass pitches.
- Explore opportunities for a picnic area on site.

53. Hemlockstone

Quick facts:

- Located in southwest analysis area (Stapleford)
- Space includes informal / youth space
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Introduce clearer signage to distinguish between mountain bike tracks and pedestrian footpaths.
- Introduce playful signage around local Hemlockstone landmark.
- Undertake assessment to understand impact of mountain biking within the site on local wildlife within the nature reserve and manage if needed.

54. Banks Road Open Space

Quick facts:

- Located in southwest analysis area (Toton)
- Space includes NEAP equipped play
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Clean graffiti from benches and work with communities and explore opportunities for signage or CCTV to prevent graffiti on-site.
- Replace signage and include welcoming signage encouraging play.
- Introduce wayfinding signage within site to signpost to wider area and links into Toton Fields Local Nature Reserve.

55. Chester Green MUGA

Quick facts:

- Located in southwest analysis area (Toton)
- Space includes informal / youth space
- Lower quality and higher value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Replace signage and include welcoming signage encouraging play.
- Repaint and clean graffiti from MUGA and teen shelter.
- Replace worn benches along river bank.
- Ensure safety alongside river bank by introducing fencing or re-routing the path where it runs close to eroded banks.

56. Toton Fields LNR

Quick facts:

- Located in southwest analysis area (Toton)
- Wider informal space
- Higher quality and higher value score
- Meets the benchmark score for theme 4

Recommended actions:

- Explore opportunities to create and exploration trail through the LNR to connect children to natural features.
- Explore opportunities for safe entry point down to the river banks to prevent erosion.

57. Barncroft

Quick facts:

- Located in southwest analysis area (Chilwell)
- Wider informal play space
- Higher quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Improve links between the space and area outside Chilwell Community Centre.
- Explore opportunities for some sensory play musical instrument play within small space.

58. Summer Crescent

Quick facts:

- Located in southeast analysis area (Beeston)
- Space includes LEAP equipped play
- Higher quality and lower value score
- Does not meet the benchmark score for any theme

Recommended actions:

- Explore opportunities for tree planting to increase shading within site.
- Explore opportunities for increasing provision of seating, including social seating for children.

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Appendix 3

Equality Impact Assessment

The Equality Act 2010 replaces the previous anti-discrimination laws with a single Act. It simplifies the law, removing inconsistencies and making it easier for people to understand and comply with it. It also strengthens the law in important ways, to help tackle discrimination and equality. The majority of the Act came into force on 1 October 2010.

Public bodies are required in it to have due regard to the need to:

- eliminate unlawful discrimination, harassment, victimisation and any other conduct prohibited under the Act
- advance equality of opportunity between people who share a protected characteristic and people who do not share it, and
- foster good relations between people who share a protected characteristic and people who do not share it.

The public sector Equality Duty came into force on 5 April 2011. The duty ensures that all public bodies play their part in making society fairer by tackling discrimination and providing equality of opportunity for all. It ensures that public bodies consider the needs of all individuals in their day-to-day work – in shaping policy, delivering services and in relation to their own employees.

The Equality Duty encourages public bodies to understand how different people will be affected by their activities so that policies and services are appropriate and accessible to all and meet different people's needs. By understanding the effect of their activities on different people, and how inclusive public services can support and open up people's opportunities, public bodies are better placed to deliver policies and services that are efficient and effective.

The new equality duty replaces the three previous public sector equality duties, for race, disability and gender. The new equality duty covers the following protected characteristics:

- age
- disability
- gender reassignment
- pregnancy and maternity
- race – this includes ethnic or national origins, colour or nationality
- religion or belief – including lack of belief
- sex
- sexual orientation.

It also applies to marriage and civil partnership, but only in respect of the requirement to have due regard to the need to eliminate discrimination.

The Council has also decided to treat people who have care experience as if they had a protected characteristic under the law.

Having due regard means consciously thinking about the three aims of the equality duty as part of the process of decision-making. This means that consideration of equality issues must influence the decisions reached by public bodies, including how they act as employers, how they develop, evaluate and review policies, how they design, deliver and evaluate services, and how they commission and procure from others.

Having due regard to the need to advance equality of opportunity involves considering the need to:

- remove or minimise disadvantages suffered by people due to their protected characteristics
- meet the needs of people with protected characteristics, and
- encourage people with protected characteristics to participate in public life or in other activities where their participation is low.

Fostering good relations involves tackling prejudice and promoting understanding between people who share a protected characteristic and others.

Complying with the equality duty may involve treating some people better than others, as far as this is allowed by discrimination law. For example, it may involve making use of an exception or the positive action provisions to provide a service in a way which is appropriate for people who share a protected characteristic.

The Equality Duty also explicitly recognises that disabled people's needs may be different from those of non-disabled people. Public bodies should therefore take account of disabled people's impairments when making decisions about policies or services. This might mean making reasonable adjustments or treating disabled people better than non-disabled people to meet their needs.

There is no explicit requirement to refer to the Equality Duty in recording the process of consideration, but it is good practice to do so. Keeping a record of how decisions were reached will help public bodies demonstrate that they considered the aims of the Equality Duty. Keeping a record of how decisions were reached will help public bodies show how they considered the Equality Duty. Producing an Equality Impact Assessment after a decision has been reached will not achieve compliance with the Equality Duty.

It is recommended that assessments are carried out in respect of new or revised policies and that a copy of the assessment is included as an appendix to the report provided to the decision makers at the relevant Cabinet, Committee or Scrutiny meeting.

Where it is clear from initial consideration that a policy will not have any effect on equality for any of the protected characteristics, no further analysis or action is necessary.

Public bodies should take a proportionate approach when complying with the Equality Duty. In practice, this means considering the Equality Duty where a policy or function

has the potential to have a discriminatory effect or impact on equality of opportunity, and less consideration where the potential effect on equality is slight. The Equality Duty requires public bodies to think about people's different needs and how these can be met.

EQUALITY IMPACT ASSESSMENT (EIA)

Directorate:	Director of Environment and Leisure	Title of the Lead Officer responsible for EIA	Interim Director Environment and Leisure
Name of the policy or function to be assessed:		Parks and Play Strategy	
Title of the Officer undertaking the assessment:		Interim Director Environment and Leisure	
Is this a new or an existing policy or function?		This is a refresh of an existing strategy.	

1. What are the aims and objectives of the policy or function?

The Broxtowe Parks and Play Strategy 2026–2035 sets out a long-term framework to guide the planning, enhancement, management and development of parks and play spaces across the Borough. Its primary aim is to ensure that all residents, particularly children and young people, have access to high-quality, safe, inclusive and engaging play opportunities within their local communities. The strategy builds on the previous Play Strategy (2017–2025) and responds to changing demographics, emerging needs, and evolving expectations around accessibility, health, wellbeing and environmental sustainability.

A key objective of the strategy is to provide a robust evidence base through the mapping, auditing and assessment of existing parks and play provision. This includes evaluating the quantity, quality, accessibility and value of spaces across the Borough to identify gaps in provision and areas of inequality. This evidence will support informed decision-making, prioritisation of investment, and future planning decisions, including the effective use of developer contributions such as Section 106 funding.

The strategy is structured around four overarching themes which underpin its objectives:

- Inclusive and community-orientated: Ensuring equitable access to play for all ages, abilities and backgrounds, with a particular focus on reducing barriers for disabled users and underrepresented groups.
- Active and healthy: Promoting physical activity and healthier lifestyles through accessible and well-designed play and park spaces.

- Supporting wellbeing and development: Enhancing opportunities for social, emotional and cognitive development through play, including imaginative and sensory experiences.
- Nature and climate positive: Integrating green infrastructure, biodiversity and climate resilience into parks and play provision, encouraging connection with nature and supporting wider environmental objectives.

Collectively, these aims seek to ensure that parks and play spaces contribute to wider Council priorities, including reducing health inequalities, supporting community cohesion, improving mental and physical wellbeing, and creating sustainable, resilient environments. The strategy also aims to establish clear standards and design principles to guide future provision, ensuring that all new and improved spaces are inclusive, accessible, high quality, and responsive to the needs of Broxtowe's diverse communities.

2. What outcomes do you want to achieve from the policy or function?

The refreshed Parks and Play Strategy aims to deliver a more equitable, high-quality and accessible network of parks and play spaces across the Borough. A key outcome is to ensure that all residents, particularly children and young people, have fair access to safe, welcoming and engaging play opportunities within a reasonable distance of their homes. This includes reducing existing inequalities in provision by identifying gaps in accessibility, quality and value, and directing investment to areas of greatest need.

A further outcome is to improve the overall quality and inclusivity of parks and play spaces so they can be used and enjoyed by people of all ages, abilities and backgrounds. This includes increasing the availability of inclusive play equipment, improving accessibility for disabled users, and creating spaces that better meet the needs of underrepresented groups such as older children, teenagers and girls. The strategy also seeks to foster stronger, more cohesive communities by providing spaces that encourage social interaction, play and community use.

The strategy also aims to contribute to improved health and wellbeing outcomes by promoting more active lifestyles and increasing opportunities for outdoor recreation. By enhancing both formal and informal play provision, the strategy supports physical activity, mental wellbeing, and child development, while helping to address wider health inequalities across the Borough.

In addition, an important outcome is to embed environmental sustainability and climate resilience into the design and management of parks and play spaces. This includes increasing opportunities for nature-based play, supporting biodiversity, and ensuring that spaces are adaptable to the impacts of climate change. By integrating play provision with wider green infrastructure, the strategy will help create more sustainable, nature-rich environments that benefit both people and wildlife.

Finally, the strategy aims to provide a clear and consistent framework to guide future decision-making, investment and delivery. This will ensure that resources are used effectively, improvements are prioritised strategically, and new developments contribute positively to the Borough's overall play and parks provision, supporting long-term planning and sustainable outcomes.

3. Who is intended to benefit from the policy or function?

Everyone who lives or works in the Borough of Broxtowe.

4. Who are the main stakeholders in relation to the policy or function?

- Children and young people (primary users of play provision)
- Parents, carers and families
- Local residents and communities
- Schools, youth organisations and community groups
- Voluntary and community sector organisations
- Disabled people and individuals with mobility or access needs
- Neurodiverse individuals and other protected characteristic groups
- Broxtowe Borough Council services (e.g. Parks, Planning, Asset Management, Community Teams)
- Parish and Town Councils
- Developers and planning stakeholders (including those contributing through Section 106)
- Strategic partners (e.g. health organisations, environmental bodies and local partnerships)

5. What baseline quantitative data do you have about the policy or function relating to the different equality strands?

A range of baseline quantitative data has been used to inform the development of the Parks and Play Strategy. This data helps identify patterns of need, access and inequality across the Borough and is relevant to a number of equality strands:

- **Age**
    - Children and young people (aged under 19) make up just over 20% of the Borough's population.
    - The population of children has seen relatively low growth compared to a significant increase (around 20%) in residents aged 65+, indicating an ageing population.
- **Disability**
    - Approximately 7.3% of residents report being disabled or limited a lot, with a further 11% limited a little.
    - Audit data identified that around 45% of play sites did not include accessible or inclusive equipment, highlighting a gap in provision.

- **Socio-economic disadvantage (linked to equality of access)**
    - Areas within the Borough fall within the 20% most deprived nationally in terms of child income deprivation (IDACI).
    - The strategy uses deprivation and child population data to identify areas of higher play need and lower provision, ensuring investment is targeted appropriately.
- **Health inequalities**
    - Around 53.9% of children and young people are physically active, with variations across the Borough.
    - Levels of childhood obesity and mental wellbeing indicators highlight a need to increase physical activity and outdoor access.
- **Access to provision (geographical equality)**
    - Only 15% of children live within 100 metres of equipped play provision.
    - Around 63% have access within 400 metres, and 91% within 1,000 metres, demonstrating inequalities in local access.
    - 92% of residents live within a 10-minute walk of a park or play space, though quality and type of provision varies.
- **Ethnicity**
    - The Borough population is 88.9% White, with smaller but important minority ethnic communities.
    - National evidence referenced in the strategy highlights that children from minority ethnic groups are less likely to be physically active, indicating potential inequality in access or use.
- **Gender**
    - Evidence shows differences in activity levels and use of space, with girls and young women less likely to feel safe outdoors and less likely to use certain types of provision (e.g. MUGAs).

6. What baseline qualitative data do you have about the policy or function relating to the different equality strands?

Key qualitative findings relating to equality strands include:

- **Disability**
    - Feedback from stakeholders highlighted a lack of accessible and inclusive play equipment in many locations.
    - Barriers identified include poor access routes, unsuitable surfacing, steep gradients and limited supporting facilities (e.g. toilets).
- **Age (children, young people and older users)**

  - Stakeholder feedback identified a lack of provision for older children and teenagers, particularly beyond traditional play equipment.
  - There is also evidence that many green spaces lack engaging or stimulating play opportunities, particularly informal or natural play.
- **Gender**
  - Evidence referenced in the strategy highlights that existing provision, particularly facilities such as MUGAs and skate parks, are often dominated by boys, with girls reporting they have “nowhere to go”.
  - Safety concerns, particularly among girls and young women, can act as a barrier to use of parks and open spaces.
- **Socio-economic disadvantage**
  - Stakeholder engagement identified the importance of free, high-quality play opportunities in more deprived areas, where access to private or paid-for activities may be limited.
  - There is a need to ensure provision is equitable across the Borough, rather than concentrated in certain areas.
- **Ethnicity and cultural inclusion**
  - National evidence referenced in the strategy indicates that parks and play spaces may not always reflect the needs or preferences of minority ethnic groups, including cultural considerations around design and use of space.
  - There is a need to ensure spaces are welcoming and inclusive for diverse communities.
- **Health and wellbeing**
  - Qualitative evidence highlights concerns around low activity levels, mental health, and the importance of outdoor play in supporting wellbeing.
  - Feedback also identified the importance of safe, welcoming environments to encourage use of parks and play spaces.
- **Environment and access**
  - Stakeholders highlighted links between access to parks, active travel (walking and cycling), and wider infrastructure barriers such as parking and connectivity.
  - There is also a desire for more nature-based play and informal spaces, particularly in greener or woodland areas.

7. What has stakeholder consultation, if carried out, revealed about the nature of the impact?

To inform the development of the Parks and Play Strategy, early stakeholder engagement has been undertaken with key internal officers and stakeholders. This included a workshop to help shape the emerging direction and priorities of the strategy. Feedback from this engagement identified a number of important themes, including the need to improve accessibility and inclusivity of play provision, address gaps in provision for older children and teenagers, and ensure a more equitable distribution of high-quality spaces across the Borough. It also highlighted barriers to access, such as poor site accessibility, lack of inclusive equipment, and the need for more varied and engaging play opportunities.

These findings have helped to inform the draft strategy and have influenced the proposed themes and priorities, particularly in relation to inclusivity, health and wellbeing, and improving overall quality and access to play spaces.

A wider public consultation exercise will be undertaken between 22 July and 31 August 2026 to gather feedback from residents, stakeholders and users of parks and play spaces. This consultation will provide further qualitative evidence on the potential impacts of the strategy across different groups and communities. The feedback received will be used to refine the strategy and will help inform this Equality Impact Assessment as it progresses.

8. From the evidence available does the policy or function affect or have the potential to affect different equality groups in different ways? In assessing whether the policy or function adversely affects any particular group or presents an opportunity for promoting equality, consider the questions below in relation to each equality group:

Does the policy or function target or exclude a specific equality groups or community? Does it affect some equality groups or communities differently? If yes, can this be justified?

The Parks and Play Strategy does not intentionally target or exclude any specific equality group or community. The overarching aim of the strategy is to provide accessible, inclusive and high-quality parks and play spaces for all residents across the Borough.

However, the strategy does recognise that different groups experience parks and play spaces in different ways and, as a result, includes targeted actions to address existing inequalities. In this respect, the strategy will have differential impacts, which are intended to be positive and proportionate in addressing identified need. For example:

- There is a greater focus on improving accessibility and inclusive play provision for disabled users, reflecting identified gaps in current provision.
- The strategy seeks to enhance provision for older children and teenagers, who are currently underserved compared to younger age groups.
- It also recognises the need to better support girls and young women, particularly in relation to safety and the design of spaces.
- Investment will be prioritised in areas of higher deprivation or lower existing provision, to reduce inequalities in access and quality across the Borough.

These targeted approaches are justified as they respond directly to evidence gathered through data analysis, site audits and stakeholder engagement, which demonstrate that some groups currently face barriers to access or lower-quality provision.

Overall, the strategy is designed to reduce inequality rather than create it, ensuring that all communities benefit while providing additional support where it is most needed.

Is the policy or function likely to be equally accessed by all equality groups or communities? If no, can this be justified?

The strategy aims to ensure that parks and play spaces are accessible to all residents; however, it is recognised that access and use is not currently equal across all equality groups and communities and may continue to vary.
Evidence within the strategy highlights that certain groups may face barriers to access, including:

- Disabled people, due to physical accessibility issues such as surfacing, gradients and lack of inclusive equipment.
- Older children and teenagers, due to limited age-appropriate provision.
- Girls and young women, who may feel less confident using some spaces due to safety concerns or the type of provision available.
- Residents in more deprived or rural areas, where access to high-quality or nearby provision may be more limited.

As a result, the strategy is unlikely to be equally accessed by all groups in its current form. However, this is recognised and addressed within the strategy, and the proposed approach is designed to reduce these inequalities over time.
The strategy includes targeted actions to:

- Improve physical accessibility and inclusive design
- Increase provision for underrepresented groups, particularly teenagers and girls
- Prioritise investment in areas with lower provision or higher need
- Support safe, welcoming and inclusive environments for all users

This differential approach is justified, as it is based on clear evidence base and is intended to deliver positive outcomes by addressing existing inequalities, rather than reinforcing them.

Overall, while access is not currently equal, the strategy provides a structured and evidence-led approach to improving fairness and inclusivity across all communities over the lifetime of the strategy.

Are there barriers that might make access difficult or stop different equality groups or communities accessing the policy or function?

Yes, there are a number of existing and potential barriers which may affect how different equality groups and communities access and benefit from parks and play spaces across the Borough.

These barriers include:

- **Physical accessibility barriers (Disability)**
  - Uneven or unsuitable surfacing, steep gradients, and limited accessible entrances may restrict access for wheelchair users, people with mobility impairments, and those with pushchairs.

- A lack of inclusive play equipment and supporting facilities (e.g. accessible seating or toilets) can further limit participation.

- **Design and provision barriers (Age and Gender)**
  - Current provision may not adequately meet the needs of **older children and teenagers**, particularly in terms of informal and social spaces.
  - Some facilities are more likely to be used by boys, which can discourage use by **girls and young women**, particularly where spaces feel unwelcoming or dominated by certain groups.
  - Perceptions of safety, especially after dark, can also act as a barrier for some users.
- **Geographical and transport barriers**
  - While overall access is relatively good, there are **variations across the Borough**, with some rural or more deprived areas having lower access to high-quality provision.
  - Limited connectivity, lack of safe walking/cycling routes, or reliance on transport can reduce accessibility for some communities.
- **Socio-economic barriers**
  - Although parks and play spaces are free to access, inequalities in provision mean that some communities have **less access to high-quality or well-equipped spaces**, limiting opportunities for play and recreation.
- **Awareness and communication barriers**
  - Some groups may have **limited awareness of available facilities**, particularly inclusive or accessible provision, if information is not clearly communicated.
  - Engagement methods may not reach all communities equally, particularly those less likely to engage through digital platforms.
- **Cultural and social barriers**
  - Differences in cultural preferences, perceptions of public space, or lack of culturally inclusive design may affect how comfortable some communities feel using parks and play space.

Could the policy or function promote or contribute to equality and good relations between different groups? If so, how?

Yes, the Parks and Play Strategy has the potential to positively promote equality and foster good relations between different groups within the community. By prioritising inclusive design, accessible provision and equitable distribution of parks and play spaces, the strategy seeks to ensure that people of all ages, abilities and backgrounds can share and enjoy these spaces together. This includes improving opportunities for inclusive play, encouraging interaction between children of different abilities, and creating welcoming environments that support social cohesion across communities.

The strategy also supports good relations by encouraging community engagement in the design and development of play spaces, ensuring that different voices are heard and reflected. By creating spaces that are safe, inclusive and responsive to

local needs, particularly for underrepresented groups such as disabled users, teenagers and girls, it helps foster a sense of belonging, mutual understanding and shared ownership of community assets.

What further evidence is needed to understand the impact on equality?

Further evidence will be gathered through the planned public consultation exercise (22 July to 31 August 2026), which will provide additional insight into how different equality groups and communities use parks and play spaces, and any barriers they experience. This will help to strengthen the understanding of impacts across protected characteristics and ensure that a wide range of views are reflected in the final strategy.

In addition, ongoing monitoring and engagement will be important to assess the effectiveness of the strategy over time. This may include collecting feedback from users, reviewing usage patterns of parks and play spaces, and working with stakeholders and community groups to understand emerging needs. This approach will ensure that the Equality Impact Assessment remains informed by up-to-date evidence and that any unintended impacts can be identified and addressed as the strategy is implemented.

9. On the basis of the analysis above what actions, if any, will you need to take in respect of each of the equality strands?

Age: The strategy recognises that different age groups have varying needs and experiences of parks and play spaces, particularly in relation to children, young people and older residents.

To address this, the following actions will be taken:

- Ensure a range of play opportunities are provided across sites, catering for different age groups, including younger children, older children and teenagers.
- Increase provision for older children and teenagers, including informal and social spaces where gaps currently exist.
- Promote intergenerational use of parks and open spaces, ensuring spaces are welcoming for all age groups, including families and older people.
- Continue to engage with children and young people through consultation and future design processes to ensure provision reflects their needs.

These actions aim to ensure that parks and play spaces are inclusive, age-appropriate and accessible to all, while addressing current gaps in provision for certain age groups.

Disability: The strategy recognises that disabled people, including those with physical, sensory and cognitive impairments, may currently face barriers in accessing parks and play spaces.

To address this, the following actions will be taken:

- Improve physical accessibility to and within sites, including pathways, entrances, surfacing and gradients to better support wheelchair users, those with mobility impairments and people with pushchairs.
- Increase the provision of inclusive play equipment, ensuring opportunities for children of all abilities to play together rather than separately.
- Ensure supporting infrastructure such as accessible seating, rest areas and (where appropriate) toilet facilities are considered within larger or 'destination' sites.
- Promote awareness of accessible provision through clear signage and communication, so users are able to identify suitable locations.
- Continue to engage with disabled users, carers and representative groups through consultation to better understand needs and inform future improvements.

These actions aim to reduce existing barriers, improve inclusivity and ensure that parks and play spaces can be accessed and enjoyed by disabled people on an equal basis.

Gender: The strategy recognises that people of different genders may experience parks and play spaces differently, particularly in relation to safety, accessibility and the type of provision available.

To address this, the following actions will be taken:

- Improve the design of parks and play spaces to ensure they feel safe, welcoming and inclusive, including considering visibility, layout and general environment.
- Increase provision that appeals to a wider range of users, particularly addressing gaps for girls and young women, such as social spaces, informal play and non-sport-based activities.
- Ensure that new and improved play spaces are designed to encourage shared and inclusive use, rather than being dominated by particular groups.
- Continue to engage with different user groups through consultation, including girls and young women, to better understand their needs and experiences.

These actions aim to create more balanced, inclusive spaces that support equal access and use across genders, while addressing current differences in how spaces are experienced.

Gender Reassignment: No specific impacts have been identified in relation to individuals undergoing gender reassignment. The strategy is intended to be

inclusive and accessible to all users and does not include any measures that would directly disadvantage this group.

However, the Council recognises the importance of ensuring that parks and play spaces are safe, welcoming and inclusive environments for everyone, regardless of gender identity. As part of the ongoing development and implementation of the strategy, the Council will continue to monitor any emerging issues or impacts and will respond appropriately if any barriers or concerns are identified.

Marriage and Civil Partnership: No specific impacts have been identified in relation to individuals who are married or in a civil partnership. The strategy is intended to be inclusive and accessible to all residents and does not include any measures that would directly disadvantage this group.

The strategy focuses on improving access to parks and play spaces for the wider community and does not differentiate based on marital or partnership status. However, the Council will continue to ensure that all services and spaces remain welcoming and accessible to all users, and will monitor any emerging issues or impacts as the strategy is implemented.

Pregnancy and Maternity: No significant negative impacts have been identified in relation to pregnancy and maternity. The strategy is intended to provide inclusive, accessible and safe parks and play spaces for all users.

However, it is recognised that individuals who are pregnant or have caring responsibilities for young children may have specific accessibility needs. To support this, the strategy includes actions to:

- Improve access routes within parks and play spaces, including pathways suitable for pushchairs.
- Provide adequate seating and rest areas, particularly within larger or ‘destination’ sites.
- Ensure spaces are designed to be safe and welcoming for families with young children.

The Council will continue to monitor any emerging issues as the strategy is implemented to ensure that parks and play spaces remain accessible and suitable for those who are pregnant or caring for young children.

Race: No specific negative impacts have been identified in relation to race. The strategy is intended to provide parks and play spaces that are inclusive and accessible to all residents, regardless of ethnicity or cultural background.

However, it is recognised that people from different ethnic and cultural backgrounds may have different experiences, preferences or perceptions of public spaces. To address this, the strategy promotes:

- The creation of welcoming and inclusive environments that can be used by all communities.
- Consideration of different needs and preferences through ongoing engagement and consultation.
- Continued monitoring to ensure that parks and play spaces are accessible and appropriate for a diverse population.

The Council will use the public consultation and future engagement to better understand any specific needs or barriers experienced by different communities and will respond accordingly.

Religion and Belief: No specific impacts have been identified in relation to religion or belief. The strategy is intended to be inclusive and accessible to all residents and does not include any measures that would directly disadvantage individuals or groups based on their religion or beliefs.

The strategy promotes the provision of welcoming, safe and inclusive public spaces that can be used and enjoyed by people from all backgrounds. However, it is recognised that individuals from different communities may have varying preferences or perceptions regarding the use of public spaces.

The Council will continue to ensure that parks and play spaces remain inclusive and will use consultation and ongoing engagement to understand any emerging needs or issues, responding where appropriate.

Sexual Orientation: No specific impacts have been identified in relation to sexual orientation. The strategy is intended to provide inclusive and accessible parks and play spaces for all residents and does not include any measures that would directly disadvantage individuals based on their sexual orientation.

The strategy promotes the provision of safe, welcoming and inclusive public spaces that can be used and enjoyed by people from all communities. These spaces support social interaction and community cohesion, which can have a positive impact for all users.

The Council will continue to ensure that parks and play spaces remain inclusive and will monitor any emerging issues or concerns as part of ongoing engagement and implementation of the strategy.

Care Experience: No specific negative impacts have been identified in relation to individuals with care experience. The strategy is intended to provide inclusive and accessible parks and play spaces for all residents, including children and young people with a range of backgrounds and lived experiences.

However, it is recognised that children and young people with care experience may be more likely to benefit from safe, accessible and high-quality community spaces, particularly where access to other forms of recreation may be limited. The

strategy supports this by promoting equitable provision of parks and play spaces, particularly in areas of higher need, and by ensuring that spaces are welcoming and free to access.

The Council will continue to ensure that parks and play spaces remain inclusive for all users and will monitor any emerging issues or impacts, including through consultation and ongoing engagement as the strategy is implemented.

Chief Executive

I am satisfied with the results of this EIA. I undertake to review and monitor progress against the actions proposed in response to this impact assessment.

Signature: Chief Executive

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Housing

Review of Disabled Facilities and Additional Grants Policy

1. Purpose of Report

To review the criteria within the existing Disabled Facilities and Additional Grants Policy (Private Dwellings). The policy was updated in 2025 but following two reports to Cabinet to approve grants outside the discretionary threshold, a review of the criteria to facilitate more efficient approval of the larger and complex projects being submitted, was added to the work programme. This is in accordance with the Council's Corporate Priority of Housing to provide a good quality home for everyone by responding to need and to facilitate adaptations for disabled people in the private sector.

2. Recommendation

Cabinet is asked to RESOLVE that the Disabled Facilities and Additional Grants Policy (Private Dwellings) is updated to allow approvals of amounts outside the discretionary threshold by the Head of Environmental Health, Licensing and Private Sector Housing in conjunction with the Portfolio Holder for Housing and the Interim Deputy Chief Executive and Section 151 Officer of, subject to funding being available be approved.

3. Detail

The Council, in its role as a local housing authority, is under a statutory duty by virtue of the provisions of the Housing Grants Construction and Regeneration Act 1996 (the Act) to provide Disabled Facilities Grants (DFG) for private sector residential adaptations where the appropriate legislative conditions are met. The purpose of the grant includes making sure the dwelling is safe for the disabled occupant and to overcome obstacles which prevent access to its facilities and amenities.

Although the provision of mandatory DFG is covered by the Act and the Council must comply with the legislation, the Policy (which was developed in collaboration with the other Nottinghamshire authorities) sets out how these matters will be dealt with regard to matters not covered by the legislation and in respect of other priorities and discretionary grants administered by officers within the Private Sector Housing team.

The grants are funded by an allocation from Central Government through the Better Care Fund. The Policy includes the priority given to mandatory grants and that discretionary grants will only be awarded where the funding is available.

In 2025, the Policy was updated to reflect legislative and operational changes, to improve the clarity between the mandatory and discretionary grants and increase the discretionary limit from £20,000 to £30,000. The Policy does not deal with adaptations in Council property which is subject to a separate policy.

The 2025 Policy review included increasing the discretionary top up limit to £30,000 in recognition of the increasing costs of building works and the number of larger and complex adaptations to allow the progression of these projects. This was agreed across the Nottinghamshire local authorities for consistency.

The existing Policy requires any deviation from the limits to have Cabinet Approval. Over the last 12 months, three reports have required Cabinet approval (one that was within the Policy limits but unforeseen significant drainage works resulted in an exceedance part way through the project). However some projects have been delayed where limits have been exceeded to require attempts to raise alternative funding. Delegated approval of applications outside the Policy limits to the Deputy Chief Executive and Section 151 Officer and the Head of Environmental Health, Licensing and Private Sector Housing, in consultation with the Portfolio Holder for Housing, will allow timely decisions to be made on applications and progression of larger and more complex projects more quickly. Approvals will still be subject to funding being available.

The proposed amended policy is attached at **Appendix 1** with a table summarising the key Policy updates being attached at **Appendix 2.**

Consideration could be given to additional policy changes such as further increasing the discretionary approval limits under the existing scheme of delegation to the Head of Environmental Health, Licensing and Private Sector Housing, additional discretionary grants such as for hoarding or specific health conditions/disabilities or disregarding the first part of income for all applicants. Whilst additional Better Care Funding from Central Government has been received in recent years, any variations need to be contained within the budgets and to allow all mandatory grants to be approved. Historically when applications exceeded funding available, applicants have been placed on a waiting list until funding has become available and this situation has created delays in works being completed.

4. Key Decision

This report is a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012 as results in the Council incurring expenditure of £250,000 or more and is significant in terms of its effects on communities living in an area comprising of two or more Wards or electoral divisions in the Council's area.

5. Updates from Scrutiny

   Amendment to section 4.2 for clarity.

6. Financial Implications

   The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

   The cost of Disabled Facilities Grants is recognised in the approved Capital Programme with the scheme being fully funded by an allocation from central government through the Better Care Fund (BCF).

   Any uplift in Policy limits will likely impact on the use of available funds. The scheme will continue to be funded by the BCF allocation with the caveat included in the Policy that any grant is subject to the necessary funding being available.

7. Legal Implications

   The comments from the Head of Legal Services were as follows:

   The relevant legislation is outlined in the report and policy. The Council must comply with the legislation in order to avoid any challenges that may arise. By having an approved policy in place also helps avoiding such challenges.

8. Human Resources Implications

   There were no comments from the Human Resources Manager.

9. Union Comments

   There were no Union comments.

10. Climate Change Implications

    There are no climate change implications.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    No Equality Impact Assessment is required as the change is only a procedural change to one element of the policy already approved.

13. Background Papers

    Nil.

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Appendix 1

Policy: Disabled Facility and Additional Grants

Author: Suzanne Hickey
Division: Environmental Health/Private Sector Housing
Date: 2 August 2021 Reviewed August 2023 and January 2025
Review Date: July 2026

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1.0 Purpose

This document describes how Broxtowe Borough Council (the Council) will provide both mandatory and discretionary Disabled Facilities Grants (DFG's) and additional discretionary grants for private sector residential adaptations.

This document contains information on eligibility for grant assistance, conditions relating to applications, approval and payment of grants and other relevant conditions and requirements. It is to be read in conjunction with the relevant sections of the Housing Grants Construction and Regeneration Act 1996 (The Act). This Policy has been produced in collaboration with the District Councils within Nottinghamshire and Nottinghamshire County Council.

2.0 Scope

The scope of this Policy includes mandatory and discretionary disabled facilities grants and additional discretionary grants. This Policy excludes adaptations to our own housing stock, which is dealt with by a separate Policy.

3.0 MANDATORY DISABLED FACILITIES GRANTS

3.1 The Council, in its role as a local housing authority, is under a statutory duty by virtue of the provisions of the Act to provide Disabled Facilities Grants (DFGs) for private sector residential adaptations where the appropriate legislative conditions are met.

3.2 The purpose of a mandatory DFG is set out in the Housing Grants Construction and Regeneration Act 1996 and subsequently supplemented by The Disabled Facilities Grants (Maximum Amounts and Additional Purposes) (England) Order 2008 and The Housing Renewal Grants (Services and Charges) Order 1996, and is broadly summarised as follows:

- Facilitating Access – works to remove or help overcome any obstacles which prevent a disabled occupant move freely into and around a dwelling, access to the garden and enjoying the use of the dwelling (including facilitating access to the principal family room) and the facilities and amenities (including facilitating care of dependant residents - such access as is required to allow for a disabled occupant to provide care for a person who is normally resident whether or not they are related to the disabled person and this may include adaptations to a part of the dwelling to which the disabled person would not normally need access, but which is used by the person to whom they are providing care and therefore it is reasonable for such works to be carried out.),
- Facilitating access to a room usable for sleeping – works to provide a room usable for sleeping where adaptation of an existing room in a dwelling (upstairs or downstairs) or the access to that room is unsuitable. Where the disabled person shares a bedroom with a

spouse or partner a grant may be given to provide a room of sufficient size so that normal sleeping arrangements can be maintained.

- Facilitating access to a bathroom – This may include provision of, or access to, a WC, washing, bathing and/or showering facilities and includes the use of such facilities,
- Facilitating preparation and cooking of food. This may include rearranging or enlarging a kitchen to improve the manoeuvrability for a wheelchair or mobility aid and to provide specially modified or designed storage units, worktop area etc. Where most of the cooking and preparation of meals is done by another household member, it would not normally be appropriate to carry out full adaptations to the kitchen. However, it might be appropriate to carry out certain adaptations that enable the disabled person to perform minor functions in the kitchen, such as preparing light meals or hot drinks,
- To make a dwelling safe for a disabled applicant and other persons residing with them. This may include the provision of lighting where safety is an issue or for adaptations designed to minimise the risk of danger where the disabled person also has behavioural challenges.
- Facilitating the use by a disabled occupant of a source of power, light or heat. This may include providing or improving a heating system. A grant will not be given to adapt or install heating in rooms which are not normally used by the disabled person. The installation of central heating will only be considered where the well-being and mobility of the disabled person would otherwise be adversely affected.
- Facilitating Access through common parts. This may include works to facilitate access to a dwelling through common parts of a building.

The Council will have regard to the Act and associated guidance in determining the eligibility of any works for DFGs.

3.3 In order to approve DFGs, officers will work with the Occupational Therapy (OT) Service at Nottinghamshire County Council in accordance with the requirements of the Act which requires consultation with the relevant social care authority on the adaptation needs of disabled people seeking help through DFG's.

3.4 The OT service will make referrals to the Council recommending work to be carried out which is necessary and appropriate in line with the above, to meet the needs of their client. Any referral made by an independent OT will be considered in the same way and the Council will refer all relevant documentation to the Social Care Authority for comment in compliance with its statutory duty to consult. The Council themselves must decide what action to take on the basis of that advice and therefore the type, if any, for which the grant is approved and will consider if it is reasonable and practicable to carry out the relevant works having regard to the age and condition of the property.

3.5 Although the provision of mandatory DFGs is covered by the Act and the Council must comply with the legislation, this document sets out the Policy that will be applied by the Council in the provision of grants with regard to matters not covered by the legislation.

3.6 Applicant and eligibility criteria, including property owner or occupation and consent certificates are detailed in the application information.

3.7 Repayment Conditions are detailed in section 7.

Amount of Mandatory DFG

3.8 The maximum amount of a mandatory disabled facilities grant that the Council can pay in respect of any single grant application is set by Order and is currently £30,000. This amount is reduced by any contribution statutorily assessed through a 'Test of Resources' as payable by the grant applicant.

4.0 DISCRETIONARY GRANTS

4.1 In addition to providing mandatory DFGs, the Council has the power to offer discretionary financial assistance by virtue of the Regulatory Reform (Housing Assistance) (England & Wales) Order 2002. This section sets out the Policy that will be applied by the Council in the provision of discretionary grants. Using these powers, the Authority has agreed to offer discretionary grants for private sector residential adaptations in certain specific circumstances. This section relates solely to discretionary grant assistance provided by the Council toward disabled adaptations where eligibility for a mandatory grant has been identified or approved **OR** alternative schemes (such as Dementia Grants, Hospital Discharge, Warm Homes on Prescription etc.) to meet the identified needs of the applicant and which meet the Better Care Funding objectives of reducing the reliance on health and social care by improving the conditions in the home.

Discretionary DFG Top-up (Linked to the Mandatory DFG)

4.2 The Council may provide an additional maximum amount of up to £30,000 as a discretionary top-up where circumstances are such that the cost of work exceeds £30,000 (either as a result of unforeseen works or the extent of the original work inclusive of a contingency sum, that is recommended to the Council). **This type of assistance will only be offered as a top up for schemes that fall within the mandatory grant headings as previously described.** Any discretionary top-up may however be repayable on any subsequent disposal of the subject property and will be recorded as a charge against the property.

4.3 Any discretionary assistance awarded under this part of the scheme will be given without prejudice and will have no regard to any agreed Nottinghamshire County Council funding or the ability of the applicant to self-fund the identified additional costs. Such discretionary assistance will only be considered having regard to the amount of resources the Authority has at that time. If it does not have sufficient resources available to deal with other referrals that have been passed to the Authority by the Occupational Therapy Service at the time, the Authority reserves the right not to approve any discretionary top-up grant. The

Council will however consider the likely demand for discretionary assistance and where practicable build this into its financial planning and bidding process.

4.4 In some cases of hardship and exceptional and compelling circumstances for higher cost adaptations, we may provide a discretionary top-up to the grant beyond the discretionary £30,000 limit. The requests are assessed on a case-by-case basis and require approval by the Portfolio Holder for Housing, the Director of Finance and the Head of Environmental Health, Licensing and Private Sector Housing as greater than the normal Policy limits. The occupational therapist can endorse and initiate this additional funding request where they are satisfied that the proposed scheme of works is necessary and appropriate to meet the assessed person's needs. This will be subject to funding being available.

Minor Repairs Works (Linked to the Mandatory DFG)

4.5 Where a mandatory DFG is to be given in respect of adaptations to a dwelling, the Council may provide funding to undertake minor works at the same time in the same dwelling where it is considered these will have a positive impact on the health and well-being of the disabled person. These works will include the following:

- Works to eliminate Category 1 hazards (Housing Health and Safety Rating System) which could impact on the disabled person.
- Replacement of single glazed windows, or obsolete double-glazed windows, in living rooms, bedrooms, and bathrooms regularly used by the disabled person.
- Replacement, repair, or upgrade of defective fixed heating systems that will directly impact on the disabled person.
- Replacement repair, or upgrade of electrical system that will directly impact on the disabled person.

4.6 Grant for minor repairs work will not be available in respect of properties where the applicant is a tenant.

4.7 The amount of grant given for this purpose will be limited to a maximum of £10,000

4.8 The works for which grant is to be made available will be specified by the Housing Grants Officer.

4.9 No grant will be made available for works already completed.

4.10 The whole of any grant given under this discretion will be recorded as a property charge and will mirror those repayment conditions attached to mandatory DFG's. If the subject property is disposed of within 10 years of the certified date the Authority may require repayment of all or a proportion of the grant following consideration of the reasons behind the disposal. The Authority will apply the same criteria as for mandatory grants in determining if and how much of the grant will be repayable. All grant conditions will cease on expiry of the 10-year period from the certified date.

5.0 OTHER DISCRETIONARY GRANTS

Dementia Adaptations

5.1 These grants are available to someone who has been diagnosed with dementia and is still living in their own home. This can be as an owner occupier or tenant.

5.2 The scheme will provide a grant of up to £2,500 for minor adaptations designed to help the individual, and their carers, cope with the challenges of living with the condition. A letter from the GP or specialist confirming that dementia has been diagnosed will be required.

5.3 The grant can cover adaptations within the home such as:

- Replacing floor coverings that cause confusion or safety issues
- Replacing tiling or bathroom fittings (such as toilet seats and rails) to improve visual perception
- Changing cupboards to clear fronted doors, to enable recognition of where items are in the kitchen
- Changing lighting schemes to improve visibility around the home
- Installing noise reduction measures
- Ensuring gardens and paths are level and free from hazards.

5.4 The specification for works will be provided by any one of the GP, specialist dementia care worker, occupational therapist, or other suitably qualified practitioner.

5.6 The Dementia Adaptation Grants will not cover items that could be funded through a Disabled Facilities Grant or through Nottinghamshire Social Care, but can be used in addition to them.

5.7 The Dementia Adaptation Grants will not be subject to the Test of Resources and the grants will not be repayable.

Hospital Discharge Grant

5.8 This grant is for people in hospital awaiting discharge back to their homes and provides up to £10,000 to applicants to carry out urgent adaptations and /or other works to their home which are needed to facilitate their discharge from hospital.

5.9 Works can include works to the property itself, including work to heating systems. Grant can also be given to undertake clearance of the property where hoarded goods are preventing hospital discharge.

5.10 Applicants must be:

- an owner occupier or a tenant in a privately rented property
- in receipt of a means tested benefit*
- in hospital at the time of referral and awaiting discharge

5.11 The application must be accompanied by a referral from a hospital Occupational Therapist advising of the urgent adaptations that are required to the home to enable discharge.

5.12 The property to be adapted must normally be occupied on a permanent basis by the applicant and their family.

5.13 Works will be ordered to and undertaken by a contractor selected by the Council. Payment of the grant will be made when the works have been completed and evidence of this provided to the Council.

*Currently: Guaranteed pension credit
Housing benefit
Universal Credit
Income based job seekers allowance
Income based employment and support allowance
Working tax credit and/or child tax credit where annual income for the purposes of the tax credit assessment was below £15,276
Council Tax support (excluding single person discount)

5.14 Hospital Discharge Grants are not subject to the Test of Resources and will not be repayable.

5.15 Hospital Discharge grants will not be given in respect of any matters which would be eligible under the Handy Person Adaptation Service (HPAS) or other grant funding.

Warm Homes on Prescription (WHOP)

5.16 These grants are available to residents where they or members of their household have a specified medical condition exacerbated by cold, and they meet the criteria and are in receipt of a qualifying benefit or household income below a specified level.

5.17 A single grant of a maximum of £6,000 will be awarded to eligible applicants in order to undertake improvements to the dwelling to eliminate problems associated with cold or damp.
Examples of such works include, but are not limited to the following:

- Boiler repairs / replacement (NB. This is not an emergency service)
- Provision / replacement of radiators
- New heating controls
- Draught-proofing
- Insulation works

5.18 Currently this scheme is delivered in conjunction with other partner organisations who undertake visits to assess the energy efficiency of the home

and whether the resident can afford to keep the house at a healthy temperature. A range of actions are then taken to achieve affordable warmth on behalf of the householder, including commissioning heating and insulation works, income maximisation (benefits checks and fuel switching) and accessibility to other grant funding measures all of which will allow the resident to remain independent in their own homes.

5.19 WHOP Grants are subject to the applicants meeting the specific criteria but are not repayable.

Dual residency for a disabled child

5.20 Mandatory DFG's can only be provided to the 'sole or main residence' of the disabled applicant and in circumstances covered by this section it is assumed that one party would apply for any mandatory grant on the basis that the child occupies the subject property as their sole or main residence. The main residence will be determined by consideration of the applicant's particular circumstances including which party receives child benefit and the details of any court order or mediation agreement.

5.21 The Authority will consider the details of any court order or mediation agreement and specifically the allocation of time spent with each parent in determining eligibility for assistance. No specific percentage split is proposed by this Policy as each case will be reviewed on its own merits. Factors to be considered include the specific details of any order, likely time to be spent at each property, whether the child will stay overnight at the subject property and for what period etc.

5.22 Where dual residency occurs, the Authority may consider the award of a discretionary grant for the other property, if they fall within the headings applied to mandatory schemes and are determined to be necessary, appropriate, reasonable and practicable and having regard to the resources the Authority has available at the time.

5.23 Any assistance provided under this heading will be determined and assessed using the mandatory DFG criteria and will be up to a maximum award of £30,000 and will not be subject to any form of means testing as per mandatory DFG applications for children/young persons. The grant will be recorded as a Land Registry charge against the property.

5.24 The whole of any grant given under this discretion will be recorded as a property charge and will mirror those repayment conditions attached to mandatory DFG's. If the subject property is disposed of within 10 years of the certified date the Authority may require repayment of all or a proportion of the grant following consideration of the reasons behind the disposal. The Authority will apply the same criteria as for mandatory grants in determining if and how much of the grant will be repayable. All grant conditions will cease on expiry of the 10-year period from the certified date.

5.25 Any discretionary award will only be considered having regard to the amount of resources the Authority has at the time. If the Authority does not have sufficient

resources left to deal with other mandatory referrals that have been passed to them by the Occupational Therapy Service at the time, the Council reserves the right not to approve any discretionary assistance. The Council will however consider the likely demand for discretionary assistance and where practicable build this into its financial planning and bidding process

Relocation Grant

5.26 A relocation grant may be available to an applicant who owns or privately rents their property if adaptations to their current home through DFG are determined not to be reasonable or practical and they are considering relocation to a property they intend to purchase or rent.

5.27 Applicants must be 18 or over on the date of application is made and, in the case of a disabled child, the parent(s) or legal guardian would make the application. Any application must be supported by a recommendation from the Nottinghamshire County Council's OT service or relevant Health or Social Services Care partner in the event of hospital discharge.

5.28 The Authority and the OT must be satisfied that the proposed property already meets the needs of the disabled person without further adaptation or are satisfied that it can adapted at a reasonable cost.

5.29 Applicants must be relocating within the Authority's boundary. Consideration may be given to a move within Nottinghamshire, but this would require the approval of the relevant district/borough council, whether or not adaptations are required and the scale of any adaptations before a relocation grant can be considered.

5.30 A grant of up to £5,000 may be made available towards specific relocation expenses, which includes estate agent fees, legal costs, removal costs and up to a 75% contribution toward cooker and/or fridge if built-in appliances are being left behind and none are, or have been fitted in the new property.

5.31 Applications must be submitted prior to the relocation as grants cannot be paid retrospectively. Assistance will not be given toward the purchase price of the new property.

5.32 The Authority will require quotations from independent contractors in compliance with the Authority's adopted procurement rules, that realistically reflect the cost of the works/service provided. In some circumstances, one estimate may be accepted if the Authority is satisfied that the cost is reasonable.

5.33 All applicants will be required to complete the move within 12 months from the date of approval of their application. Any payments made will be made either directly to the service/work provider or to the grant applicant. Valid invoices or receipt must be provided prior to payment.

5.34 If on sale of the applicant's existing property, a net equity of more than £20,000 is released, the Relocation Grant will only fund the physical removal costs. (Net

equity refers to any equity released when the purchase price of the new property is less that the existing property's selling price).

5.35 If the move is aborted through the fault of the applicant, then costs will not be paid, and any costs already paid will be reclaimed from the applicant. If the reason for the move failing is through no fault of the applicant, then the Authority will not recover the costs.

5.36 The new property must be the disabled person's main residence, and no applicant will be awarded a Relocation Grant on more than one occasion.

5.37 The Relocation Grant scheme will be subject to the same Test of Resources as the mandatory Disabled Facilities Grant scheme unless the relocation is for a disabled child in which case no test will be applied.

5.38 The whole of any grant given under this discretion will be recorded as a property charge and will mirror those repayment conditions attached to mandatory DFG's. If the subject property is disposed of within 10 years of the certified date the Authority may require repayment of all or a proportion of the grant following consideration of the reasons behind the disposal. The Authority will apply the same criteria as for mandatory grants in determining if and how much of the grant will be repayable. All grant conditions will cease on expiry of the 10-year period from the certified date.

Armed Forces Personnel, Veterans and Immediate Family

5.39 As a signatory to the Armed Forces Covenant, Broxtowe Borough Council is committed to supporting both serving and veteran armed forces personnel in any way possible and this includes ensuring those personnel and their families who require adaptations receive appropriate assistance. The limited financial disregard for armed forces pensions and compensation schemes adversely influence contributions required for mandatory DFG. This discretionary grant recognises these barriers and provides solutions to prioritise and be more inclusive to armed forces personnel in the spirit of the covenant. This grant will provide an alternative to a DFG and will not be offered in combination with a mandatory scheme. It does not however restrict or prohibit any individuals right to apply for a mandatory grant.

5.40 Eligibility for a grant will be limited to serving and veteran personnel and their co-habiting families who do not live within a recognised Ministry of Defence accommodation or (MOD) base. This is on the basis that the MOD retains responsibility for adapting accommodation of those personnel who reside on base. Applicants for this grant will need to provide suitable evidence of their armed forces or veteran status.

5.41 Any application for this discretionary grant will be restricted to those categories of eligible works defined for mandatory grants as detailed in Section 3.2 of this Policy. The scheme will not offer enhanced works so assessment by OT staff will mirror the current DFG process.

5.42 The grant will have an amended Test of Resources to remove some of the recognised limitations of the standard DFG Test and provide an enhanced offer to eligible applicants. The means test will disregard in full the following pensions and compensations schemes:

- Armed Forces Pension Scheme,
- Armed Forces Compensation Scheme – Guaranteed Income Payments,
- War Widow pensions.

All other earned and pension income plus eligible capital will be assessed as per the standard test of resources. Any grant offer will be calculated as per a standard DFG – i.e. eligible costs less client contribution using the revised Test of Resources. Competitive quotations for the eligible costs will be required as for other DFGs.

5.43 The maximum grant offer will mirror that of the mandatory DFG in force at the time (see Section 3.6) and grant recovery conditions will also mirror those associated with a mandatory DFG. See Section 7

General points in respect of Discretionary Grants

5.44 The decision on any application for discretionary grants shall be made by the Head of Environmental Health, Licensing and Private Sector Housing.

5.45 Any discretionary DFG will only be considered having regard to the amount of resources the Council has available at the time. If the Council does not have sufficient resources to deal with other referrals that have been received from the Occupational Therapy Service at the time, the Council reserves the right not to approve any discretionary grant. In addition, financial priority will be given to mandatory DFGs referred by the OT Service.

6.0 GENERAL REQUIREMENTS AND GRANT CONDITIONS

The following general requirements and conditions will apply to both mandatory DFGs and discretionary grants.

Cost of Work

6.1 The Council uses public money to fund the provision of both mandatory and discretionary grants and as such it must take into account value for money.

6.2 When officers schedule the work to be carried out, they will ensure it meets the needs of the applicant but at the same time they will only prepare a basic specification. If grant applicants want to have a higher specification that costs more, they will have to pay the difference themselves.

6.3 The applicant will be required to obtain at least two quotes* for the cost of work in accordance with the Authority's adopted procurement rules for the cost of the work. 3 quotes must be obtained for extensions and larger or complex cases. *The provision of stair lifts and other equipment that falls within scope of the Nottinghamshire Procurement Framework, will be exempt from the

requirement to obtain 2 quotes, unless specified by the Housing Grants Officer. The grant will usually be approved on the basis of the lowest quote unless there are extenuating circumstances. Where the applicant wants to use a contractor providing a higher quote than the one that is deemed acceptable by the Council, the applicant will have to pay the difference direct to the contractor. The Council will notify the contractor that the client will have to make a contribution and advise them of its value.

6.4 Quotes must be costed on the basis of the individual items in the schedule, provided. An overall price will not be accepted.

6.5 If the Council considers that the cost of any individual item or work within a schedule is unreasonably high, even if the overall quote was the lowest, it may reduce the cost allowed to what it considers reasonable for that particular item.

6.6 If a grant applicant has a preferred scheme of works that meets their assessed need to the same degree as the scheme proposed by the OT, for example the provision of a ground floor extension in lieu of a vertical through-floor lift installation, the Council will part fund the preferred scheme to the same degree as the grant eligible works. Any extra costs associated with the applicant's preferred scheme, including unforeseen works, architect's fees etc., must be met by the grant applicant. Evidence that the applicant has sufficient funds in place for the extra work must be made available prior to works starting. Nottinghamshire County Council's Occupational Therapy Service will be consulted to ensure that the applicant's preferred scheme meets their assessed need in full. Grant will not be fully paid until the whole scheme has been satisfactorily completed.

Means Tested Contributions

6.7 Applicants for DFGs will be required to complete a statutory test of resources form (means test) to determine whether any contribution is to be paid towards the cost of works. At present this does not apply in the case of an application in respect of a disabled child. In the majority of cases a Preliminary Test of Resources will be undertaken prior to the provision of an OT referral to provide the prospective applicant with an early indication of their likely contribution. Such preliminary tests will not be applied in urgent cases or where the OT is aware that the client is in receipt of a passport benefit. The evidenced receipt of a passport benefit (a number of means tested mainstream benefits) will automatically be assessed as having a NIL contribution toward any grant award and will receive full grant.

6.8 Where the statutory test of resources determines that the applicant has a contribution to make towards a grant, that contribution will be paid to Broxtowe Borough Council prior to the works commencing. The money will be retained by the Council and paid direct to the builder on satisfactory completion of scheduled works.

6.9 In circumstances where an applicant has a degenerative condition and where it is likely additional adaptations may be required over time it should be noted that there is no restriction on further grant applications at a later date. Any

contribution paid by an applicant towards an initial application will be deducted from any future assessed contribution if the second application is made within the prescribed period (10 years for owner occupiers and 5 years for tenants).

Grant Approval

6.10 The Council is required to approve or refuse the grant within six months of the application being made. An application is deemed to be made when the following documentation is submitted:

- A completed application form
- The appropriate certification together with proof of ownership or tenancy
- The appropriate evidence of financial resources in order that the Council can undertake the Test of Resources
- The appropriate number of quotes
- Confirmation from the County Council Occupational Therapy Service that the works which are the subject of the application are necessary and appropriate to meet the needs of the disabled occupant
- Any necessary planning permission/Building Regulation Approval

6.11 Officers from the Council's Private Sector Housing Team will work with prospective grant applicants to ensure the appropriate documentation is in place to make a valid application.

6.12 The Authority will not usually approve an application for grant where the relevant work has already begun. Any grant offer may be reduced to reflect the works undertaken prior to approval.

6.13 The Authority will not approve an application for a DFG if the relevant works have been completed.

7.0 PAYMENT OF GRANT

Completion of work

7.1 The legislation requires the Council to pay the grant on condition that the work has been carried out to its satisfaction. It also states that the Council is able to pay the contractor direct where it has advised the grant applicant prior to the grant being approved that this would be the method of payment.

7.2 The Council's officers will inspect the works once completed and if in their professional opinion the work has been carried out satisfactorily, the Council will pay the value of the grant. The Council will always pay the contractor direct, other than in exceptional circumstances. Any other payments that the grant applicant is responsible for must be made by the applicant. If the Council is not satisfied with the standard of work, it will retain the grant money until such time as any works issues have been resolved at which point they will pay the contractor.

7.3 The payment will be processed in consultation with the grant applicant.

7.4 If there is a dispute between the grant applicant and the contractor, but the Council is satisfied that the work has been completed to an adequate standard, the Council may arrange review by another officer with relevant experience or, may appoint an independent suitably qualified surveyor to assess the standard of such works.

7.5 Where a request is received for a grant to be paid in instalments, any contribution which the applicant is required to make based on the Test of Resources must be paid to the contractor before any element of the grant funding is released.

Changes in circumstances

7.6 In some cases there is a change in circumstances after the grant has been approved that affects the payment of grant. These circumstances (which are prescribed in the legislation) are;

- where the works cease to be necessary or appropriate to meet the needs of the disabled occupant.
- the disabled occupant ceases to occupy the dwelling; or
- the disabled occupant dies.

7.7 In such circumstances, the legislation states that the Council can take such action as appears to be appropriate and may decide:

- that no grant shall be paid or as the case may be, no further instalments shall be paid;
- that the works or some of them should be completed and the grant or an appropriate proportion of it paid; or
- that the application should be re-determined in the light of the new circumstances.

7.8 The Council has the right under the legislation to demand any instalment that has already been paid to be repaid to the Council forthwith together with interest from the date on which it was paid until repayment.

7.9 Where the applicant has a contribution to pay, the Council will seek to recover any instalments already paid up to the value of the contribution. If the amount of contribution does not cover the instalments that have been made, the Council will consider each case on its own merits in deciding whether to recover any further payments.

7.10 Where the applicant has no contribution to pay (i.e. the grant is for 100% of the costs of works) the Council will consider each case on its own merits in deciding whether to recover any instalments.

7.11 Decisions in respect of the Council's action relating to a change of circumstances shall be made by the Head of Environmental Health, Licensing and Private Sector Housing.

Cases in which grant may be recalculated, withheld or repaid

7.12 The Council is entitled to refuse to pay a grant or any further instalment of a grant which remains to be repaid or make a reduction in the amount of grant in the following situations detailed in the legislation:

- The Council ascertains that the amount of grant was approved on the basis of inaccurate or incomplete information and exceeds that which the grant applicant was entitled,
- The Council ascertain that without their knowledge the eligible works were started before the application was approved,
- The works are not completed within 12 months,
- The cost of works is less than the estimated expense upon which the grant was calculated,
- The work has been carried out by a contractor who was not one of the contractors who originally quoted for the work.

7.13 Where any of the above circumstances arise, the Council can demand repayment by the applicant in whole or part, of the grant or any instalment of the grant paid together with interest from the date of payment until repayment. In cases where the applicant has a contribution to pay, the Council will seek to recover any instalments up to the value of the contribution. If the amount of contribution does not cover the instalments that have been made, the Council will consider each case on its own merits in deciding whether to recover any further payments.

Repayment in case of compensation

7.14 It is a condition of the grant that the applicant takes reasonable steps to pursue any relevant claim and to repay the grant so far as appropriate out of the proceeds of such a claim. A claim is:

(i) an insurance claim or legal claim against another person in respect of damages to the premises to which the grant relates, or

(ii) a legal claim for damages in which the cost of the works to premises to which the grant relates is a part of the claim, and a claim is a relevant claim to the extent that the works to make good the damage or the cost of which is claimed are works to which the grant relates.

7.15 In the event of a breach of this condition the applicant shall on demand pay to the Authority the amount of grant so far as relating to any such works together with compound interest from such date as may be determined, calculated at such reasonable rates as the Authority may determine.

7.16 The Authority may determine not to make such a demand or to demand a lesser amount. The assumption is that the amount will be demanded in full however on representations from the applicant, the Authority will consider each case on its own merits.

General Provisions

7.17 Where work has commenced but grant entitlement has ceased and where the Council has decided that the works or some of them should be completed and the grant, or an appropriate proportion of it, repaid, the Council will arrange to make good the work so that the property is safe, secure and water-tight.

7.18 This may not include carrying out such work as finishing internal surfaces and plumbing any new facilities (unless these are the only facilities in the property) for example. Any work over and above making the property safe, secure and water-tight may have to be paid for by the applicant or some other appropriate person.

7.19 Decisions in respect of the Council's action in respect of grant being deferred, re-calculated, withheld, or re-paid shall be made by the Head of Environmental Health, Licensing and Private Sector Housing.

Deferring of Grant Payments

7.20 The Council has the discretion to defer any payment of an approved grant for a period of up to 12 months from the date of grant approval. Any such decision must be set out in within the grant approval notice.

8.0 INSTALLATION OF EQUIPMENT AND MAINTENANCE

8.1 Equipment which can be installed and removed fairly easily with little or no structural modification will not be funded by either a mandatory or discretionary DFG. The cost of supplying such equipment will fall to Nottinghamshire County Council.

8.2 Typically the type of equipment that will be covered by a mandatory DFG includes the following (although this is not an exhaustive list):

- Stair lifts
- Ceiling track hoists (excluding slings)
- Through floor lifts
- Rise and fall showering tables that are electrically powered
- Rise and fall baths that are electrically powered
- Wash and dry toilets

8.3 Where the provision of equipment is funded by a mandatory DFG it is usually the responsibility of the applicant to take out the necessary insurances and maintenance agreements to ensure the equipment is properly maintained. However, the Council will include within the grant the cost of a supplier's standard maintenance agreement to give cover for up to five years. This will exclude hoists where cover is arranged by Nottinghamshire County Council.

8.4 If a grant application is made for new equipment, it will not be approved if it can be shown that the equipment can be repaired at a cheaper cost than renewal. In such cases the costs of the repairs will fall to the householder.

9.0 CHOICE OF CONTRACTORS AND AGENTS

Contractual Relationships

9.1 Following the referral from the Occupational Therapy Service at Nottinghamshire County Council, officers from Broxtowe Borough Council will schedule the works that are required. The scheduled works will form the basis upon which contractors quote. As referred to above, the grant applicant will need to obtain appropriate quotations, however officers may source such quotes on behalf of the applicant if requested.

9.2 Whilst work is being undertaken, the Housing Grants Officer may visit the property to ensure that the work is being undertaken satisfactorily and when the work is completed, the officer will carry out a final inspection to ensure it has been completed satisfactorily.

9.3 However, except in respect of Hospital Discharge Grants, the Council is in no way responsible for the work of the contractor and there are no contractual obligations between the contractor and the Council. The purpose of the final inspection is simply to protect the public purse. All contractual relationships with respect to the carrying out of the work are between the grant applicant and the contractor.

9.4 If there is a dispute between the grant applicant and the contractor, the Council will not be able to get involved unless by some act or default where the Council has caused the issue which has led to the dispute.

9.5 Within the parameters of the legislation, the choice of contractor and any agent is that of the grant applicant. The Council will provide a list of contractors and agents who carry out this type of work. However, although contractors will be removed from the list if the Council becomes aware of unacceptable standards or practices, inclusion on the list does not constitute any recommendation by the Council or offer any form of guarantee.

10.0 REPAYMENT OF GRANT

10.1 In the case of mandatory grants, if the applicant (the recipient) has a qualifying owner's interest in the premises on which the relevant works are carried out, the Council will register a local land charge against their property, where the grant payment exceeds £5,000.

The Council will demand the repayment by the recipient of such part of the grant that exceeds £5,000 (but may not demand an amount in excess of £10,000) if—

(a) the recipient disposes (whether by sale, assignment, transfer or otherwise) of the premises in respect of which the grant was given within 10 years of the certified date (the date the Council has certified the works have been carried out to its satisfaction); and

(b) the Council, having considered—

(i) the extent to which the recipient of the grant would suffer financial hardship were they be required to repay all or any of the grant;

(ii) whether the disposal of the premises is to enable the recipient of the grant to take up employment, or to change the location of his employment;

(iii) whether the disposal is made for reasons connected with the physical or mental health or well-being of the recipient of the grant or of a disabled occupant of the premises; and

(iv) whether the disposal is made to enable the recipient of the grant to live with, or near, any person who is disabled or infirm and in need of care, which the recipient of the grant is intending to provide, or who is intending to provide care of which the recipient of the grant is in need by reason of disability or infirmity,

is satisfied that it is reasonable in all the circumstances to require the repayment.

If a grant recipient is of the opinion that any of the exemptions may be appropriate, they will be required to submit written representations to the Council setting out their case in full. The decision on whether to waive the grant recovery will be made by the Head of Environmental Health, Licensing and Private Sector Housing in consultation with the Head of Finance.

If no exemption is deemed appropriate the eligible element of the grant that can be reclaimed following a disposal of the property will be recovered in full.

Where an applicant is dissatisfied with a decision to demand repayment, they can access the Council's formal complaints procedure.

10.2 In the case of Top-up Grants, Dual-residency Grants, and Relocation Grants, the whole of any grant given under this discretion will be recorded as a property charge and will mirror those repayment conditions attached to mandatory DFG's. If the subject property is disposed of within 10 years of the certified date the Authority may require repayment of all or a proportion of the grant following consideration of the reasons behind the disposal. The Authority will apply the same criteria as for mandatory grants in determining if and how much of the grant will be repayable. All grant conditions will cease on expiry of the 10-year period from the certified date.

11.0 COMPLAINTS

11.1 Where an applicant is dissatisfied with the service they have received (including where a grant has been refused), they should contact the Head of Environmental Health, Licensing and Private Sector Housing in the first instance. If the matter is not resolved to the applicant's satisfaction, they can access the Council's formal complaints procedure.

12.0 Risk

Risk	Mitigation
Risk of Policy being unlawfully drafted	Legal section checks the Policy before approval
Risk of unreasonable decision-making	Clear criteria spelt out in Policy

13.0 Responsibilities

The Head of Environmental Health, Licensing and Private Sector Housing has delegated authority to make minor Policy amendments which do not affect the broad thrust of Policy direction. Other changes must be approved by Cabinet.

The Head of Environmental Health, Licensing and Private Sector Housing will be responsible for ensuring records of applications and decisions are kept in accordance with the Council's document retention scheme

14.0 Related Policies, Standards and Guidelines

Enforcement Policy

15.0 Review

This document will be reviewed every five-years as a minimum or wherever there may be a change of influencing circumstances.

16.0 Document Information

Information Type	Document Information
Title	Disabled Facilities Grants Policy
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Document History

Date	Summary of Changes	Version
01.4.2017	Document Created	
01.9.2020	Document amended in respect of repayments	
30.7.2021	Review and additions	
24/01/2025	Review, update, addition of WHOP, Armed Forces Section and increase of discretionary top up linked to mandatory to £30,000.	
21/05/2026	Variation of 4.4 to allow approval outside the discretionary £30,000 limit in exceptional and compelling circumstance by the Portfolio Holder for Housing in conjunction with the Director of Finance and the Head of Environmental Health, Licensing and Private Sector Housing instead of full cabinet, subject to funding being available.	

Coverage

Name/Group:
All Staff in environmental health section

End of Document

Appendix 2

Policy Section	Suggested Change	Reason for Change
4.2	Add ‘up to’ after of.	To provide clarity that Discretionary grants given in conjunction with a mandatory grant within the policy are UP TO £30,000.
4.4	Replace ‘Cabinet’ with the delegated authorisers. In some cases of hardship and exceptional and compelling circumstances for higher cost adaptations, we may provide a discretionary top-up to the grant beyond the discretionary £30,000 limit. The requests are assessed on a case by case basis and require approval by **the Deputy Chief Executive and Section 151 Officer and the Head of Environmental Health, Licensing and Private Sector Housing, in consultation with the Portfolio Holder for Housing,** as greater than the normal Policy limits. The occupational therapist can endorse and initiate this additional funding request where they are satisfied that the proposed scheme of works is necessary and appropriate to meet the assessed person’s needs. This will be subject to funding being available.	To allow increased discretionary funding to be approved without Cabinet approval facilitating decisions to be made more quickly for complex or larger adaptations or where failure of the applicant to secure additional funding would result in a failure to progress the works.

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Disabled Facilities Grants – Case Studies/Outcome Examples 2025-2026 in the Borough of Broxtowe.

1. **Eastwood**

OT recommendations – Provide a new Ground Floor Bedroom and Wet Room with access adaptations

The Applicant: has early onset Parkinson's

Tenure: Owner Occupier – (occupied by a family)

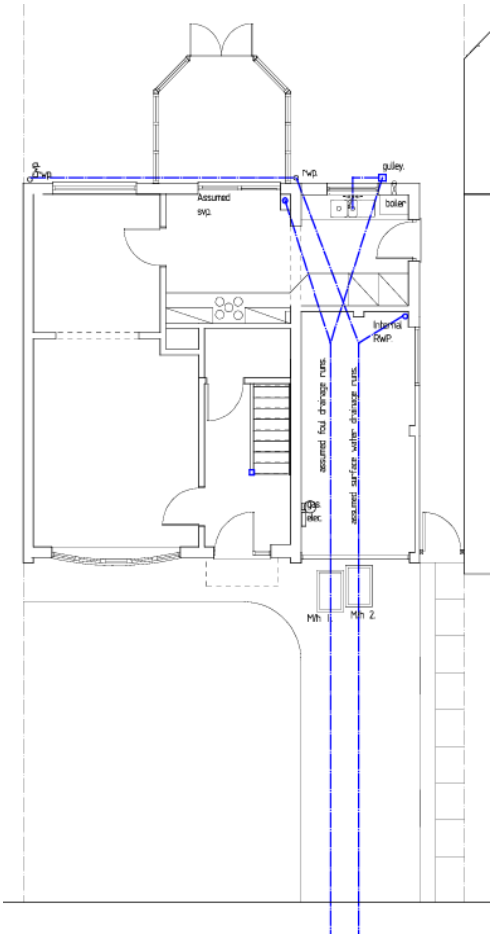
Grant Eligibility: Eligible for 100% Grant Funding, as in receipt of eligible benefit

Synopsis: The subject property is a 3-bedroom detached house on a small plot; there was no room to extend to the rear of the house without losing half of the rear garden. In consultation with the applicants architect, it was agreed that the existing attached garage would be demolished to make way for the new Ground Floor Bedroom and Shower Room. The project would also involve some access improvements.

The total project cost was nearly £83,000.00. The Legislation and Broxtowe's Policy allowed us to approve the maximum mandatory grant of £30,000.00 and in addition we had the maximum Discretionary Top Up Grant, which was £20,000.00 at that time, giving us £50,000.00 Grant funding. Occupational Therapy were able to secure a charitable contribution of £10,000.00.

We were faced with a funding shortfall of nearly £23,000.00 – the difference between the project cost and the maximum grant funding & charitable contribution.

The matter was treated as an exceptional case and put to Cabinet, and it was agreed that we could offer a further Discretionary Top Up grant to cover the funding shortfall.



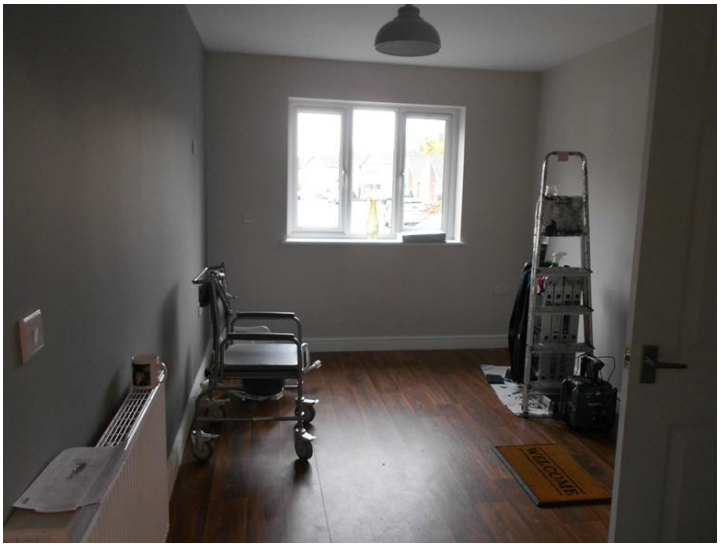


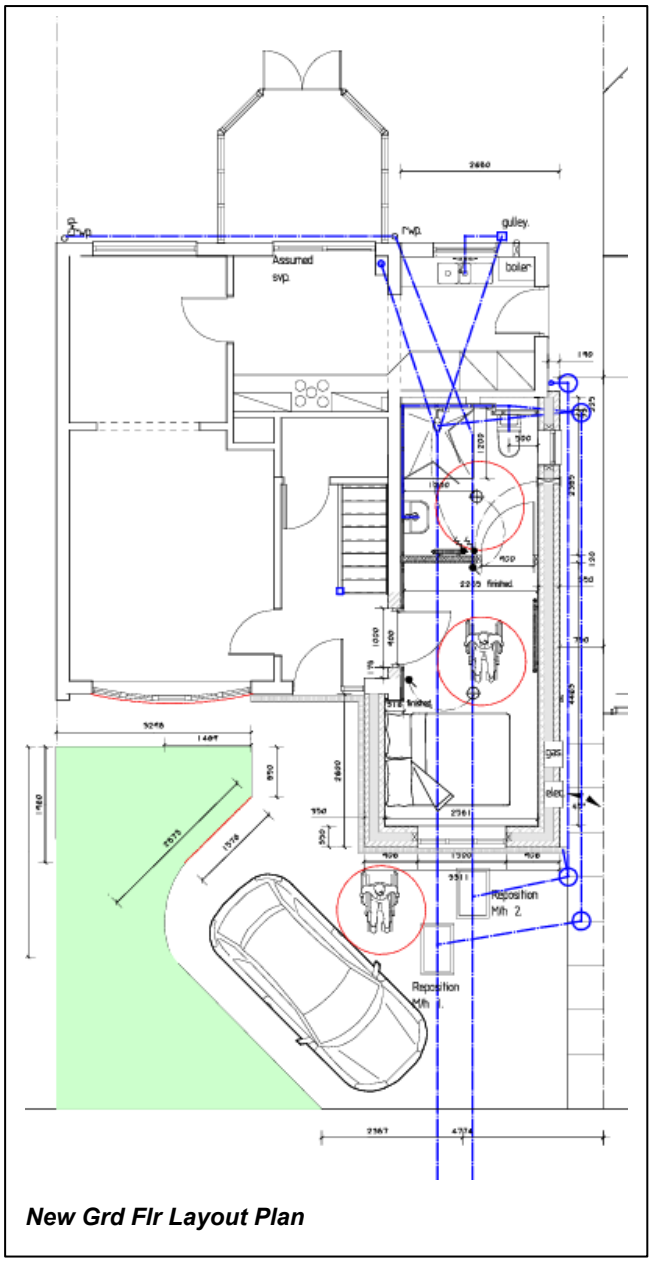
BEFORE - Existing Ground Floor Plan and photograph of the front elevation

AFTER – New front Elevation, Ground Floor shower room and bedroom









New Grd Flr Layout Plan

Final Cost was £82,811.84 to include all construction costs, VAT and the architect fees.

2. **Stapleford**

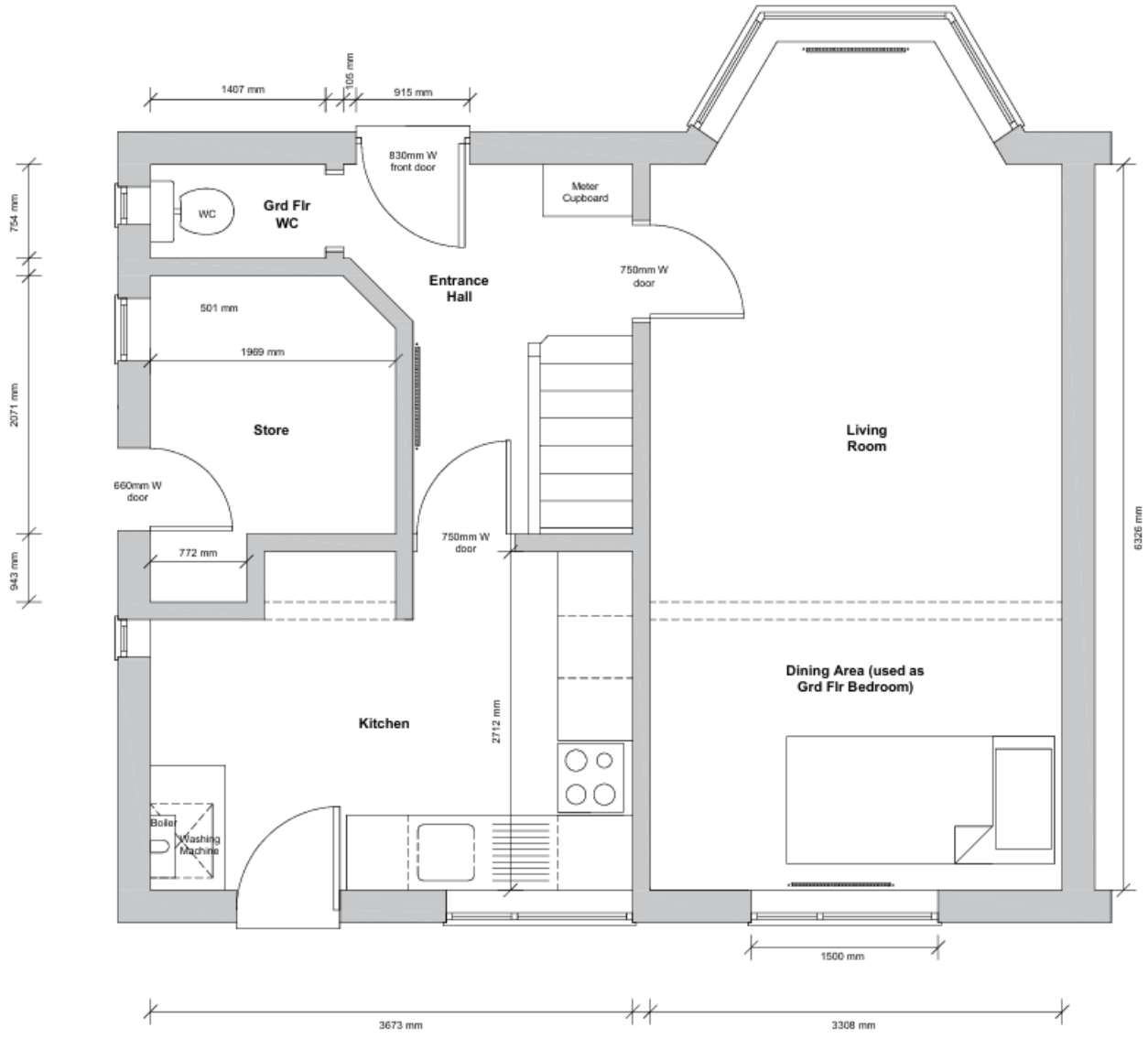
OT recommendations – Provide a new Ground Floor Shower Room with wash / dry WC and access Adaptations

The Applicant: permanent wheelchair user

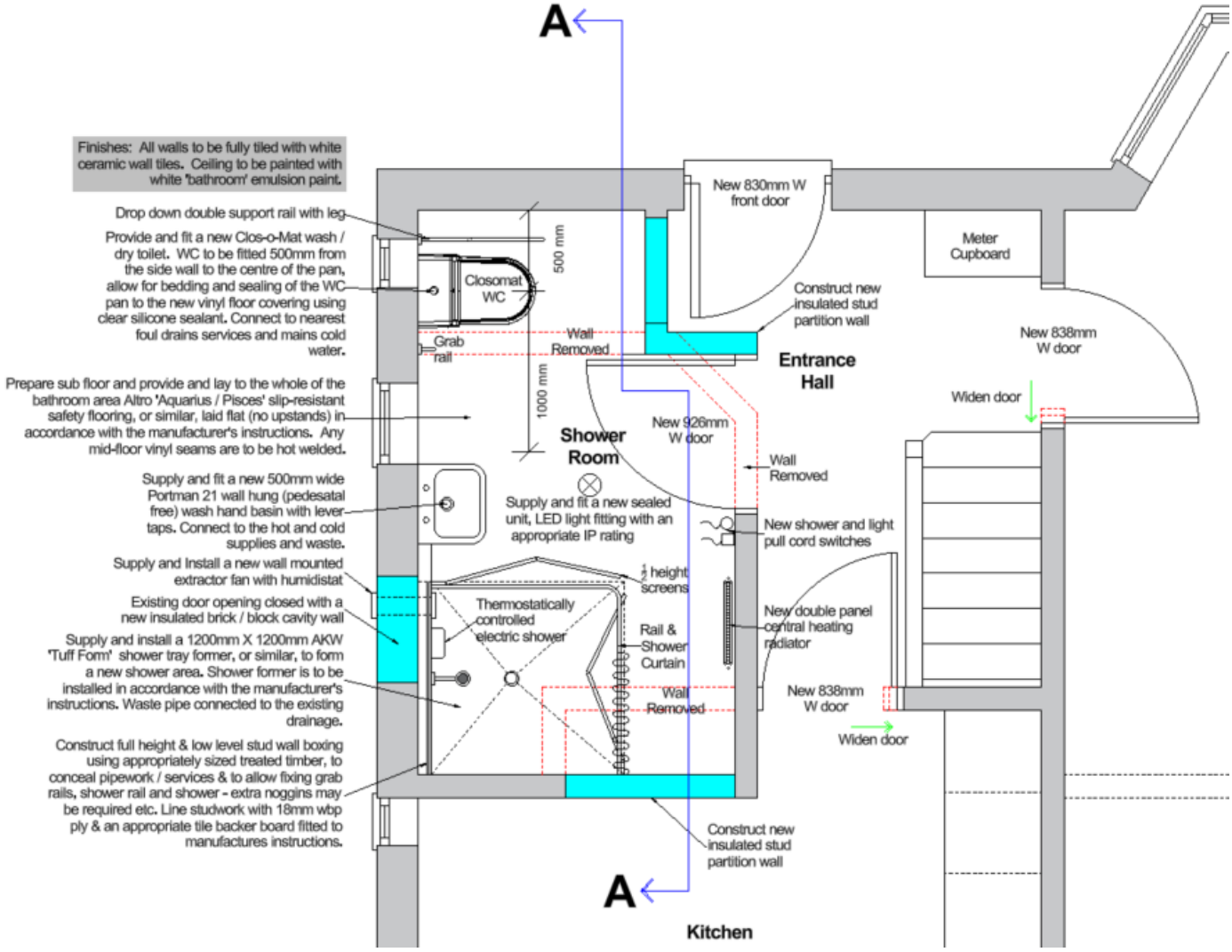
Tenure: Owner Occupier (lives alone)

Grant Eligibility: Eligible for 100% Grant Funding, in receipt of eligible benefit

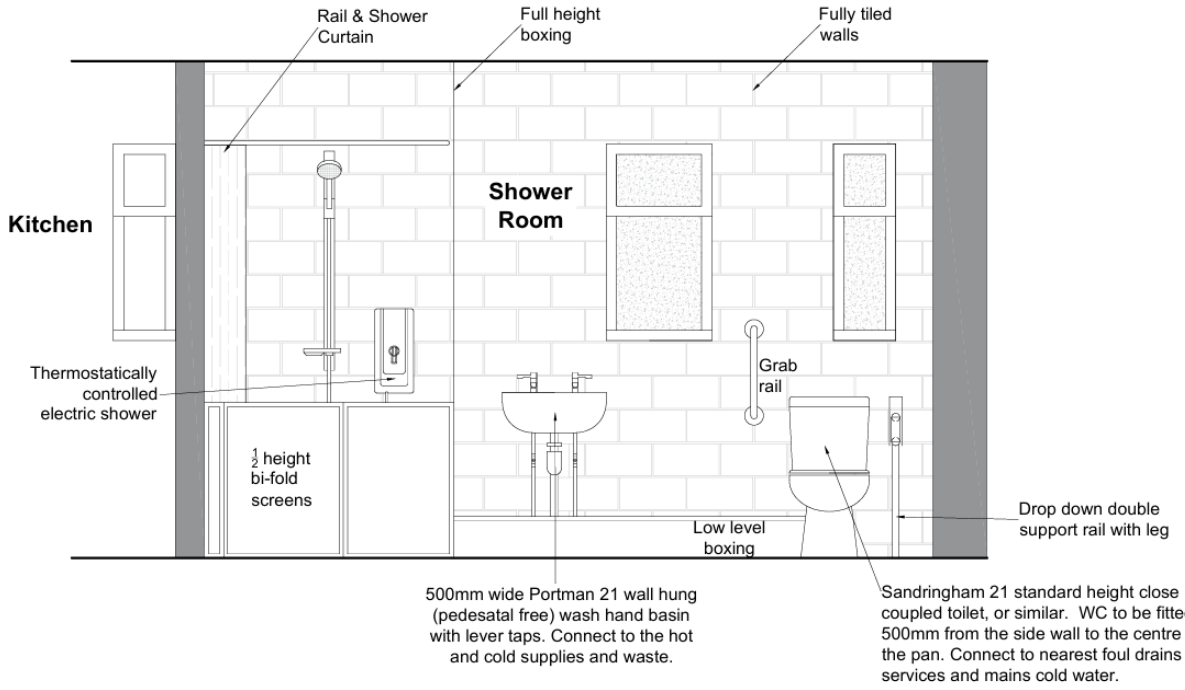
Synopsis: Since a recent amputation the applicant lives on the ground floor of the house, and is unable to access the 1st floor. There was access to a narrow Ground Floor WC and also use of a commode, but no access to bathing facilities - relying on carers for personal hygiene. We were able to progress this case 'in-house' without the requirement of an architect. In consultation with Occupational Therapy and the applicant we agreed a scheme of works and sourced quotations. Two local contractors were appointed – Contractor 1 carried out the access adaptations including the new level threshold back door and ramping etc., Contractor 2 constructed the new Ground Floor Shower Room, as detailed in the plans (prepared by Broxtowe's DFG team) and photographs below…



Existing Ground Floor Layout Plan

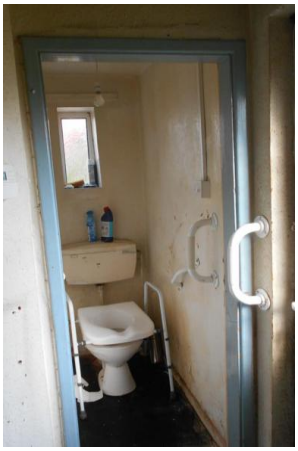


Proposed Alterations for the new Ground Floor Shower Room



Elevation – Section A – A – New Ground Floor Shower Room. NB the original plan was to install a standard close coupled WC, but the OT changed her recommendations, and we actually installed a Clos-o-Mat Wash / Dry WC so the applicant could take care of his own post toileting hygiene





Existing Grd Flr WC



New level threshold back door and ramping





New linking paths from the accessible back door to the front boundary of the property



New Clos-o-Mat wash / Dry WC



New level access shower area with anti-scald shower, ½ height carer screens, rail, curtain, semi pedestal WHB, slip resistant flooring with coved upstands and fully tiled walls.

Final Cost was £38,461.90 to include all construction costs. All works were VAT exempt and there were no architect fees as we handled this case ‘in-house’.

3. Kimberley

OT recommendations – Bathroom Adaptation to include the removal of the existing bath to be replaced with a Level Access Shower (LAS) and associated works

The Applicant: Has multiple medical health conditions that impacts on their mobility and balance

Tenure: Owner Occupier (lives alone)

Grant Eligibility: Eligible for 100% Grant Funding, in receipt of eligible benefit

Synopsis: The OT deemed the case was a high priority therefore it was processed very quickly

04/02/2025 BBC contacted by the senior practitioner OT who requested that the case be escalated to High Priority, which was agreed.

18/02/2025 the case was allocated to a Grants Officer

21/02/2025 the Grants Officer visited the premises and carried out a detailed survey of the bathroom.

28/02/2025 The plans and adaptation brief were approved by the applicant and OT, and 2 local contractors were asked to quote.

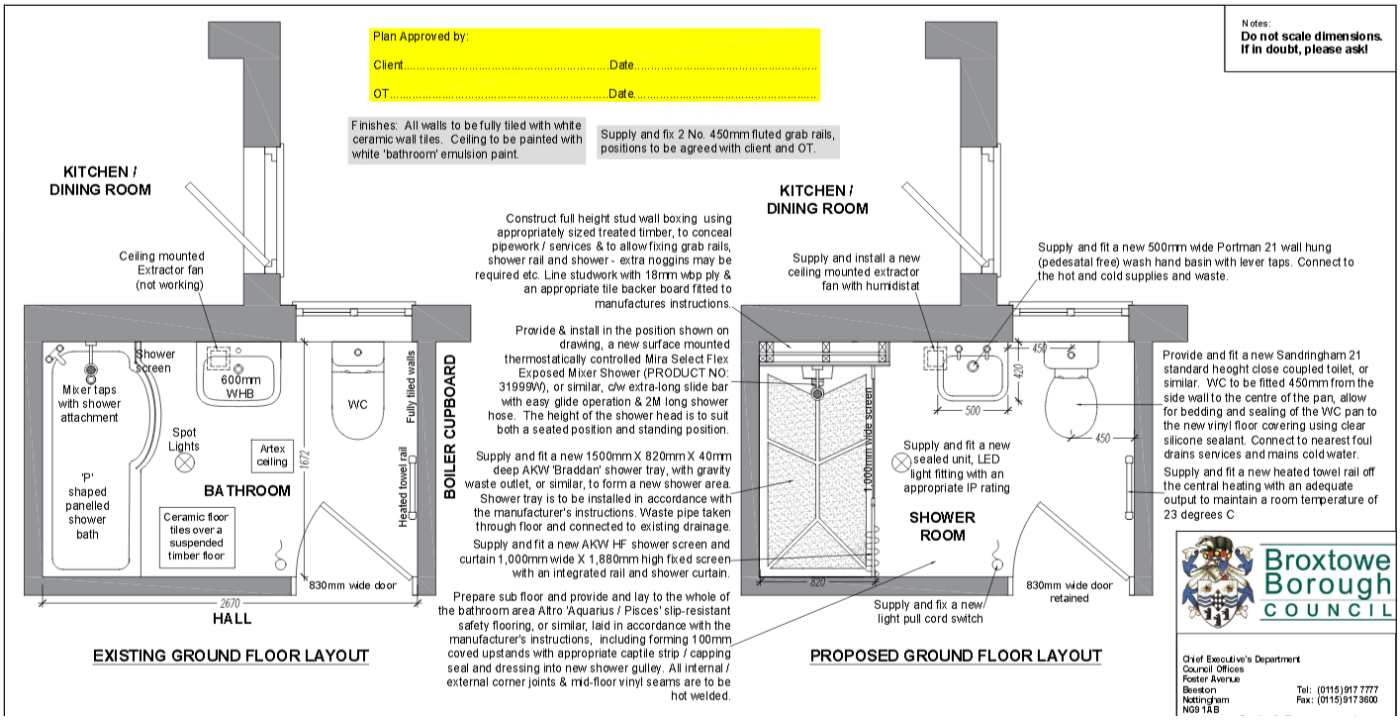
07/03/2025 The Grant was approved by the Head of Service

10/03/2025 The Contractor started work on site

21/03/2025 The Contractor completed the bathroom adaptation

27/03/2025 The Grants Officer carried out the final inspection, and the job was signed off

From the Grant Officers initial visit it took 11 working days to design the adaptations, agree the works with the applicant and OT, source 2 quotations from local builders, get the grant approved and get the builder on site (21st Feb – 10th Mar).

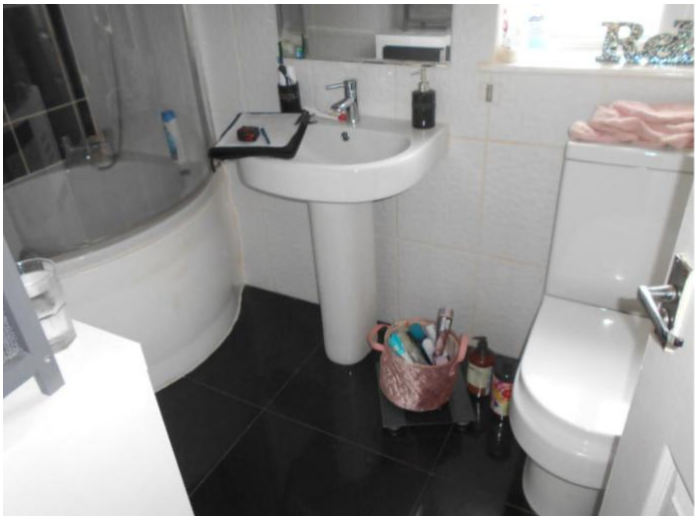


Existing & Proposed Layout Plans prepared by the Grants Officer

Existing Photographs



The 'P' shaped shower bath which the client could no longer transfer in and out of

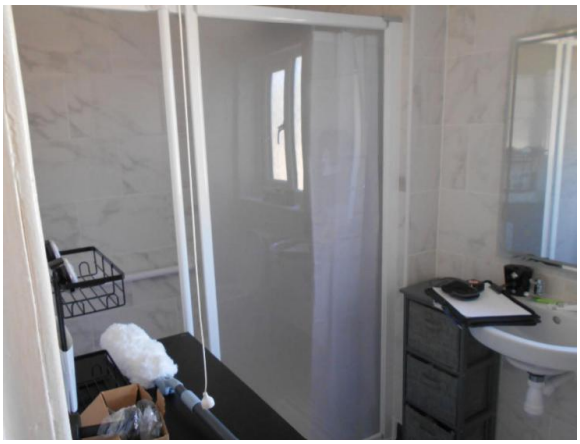


Pedestal WHB & c/c WC



Spotlights without an appropriate IP rating and redundant extractor fan

<u>Adapted Bathroom Photographs</u>



New level access shower area



New wall hung WHB (no pedestal) with lever taps



New close coupled WC





New extractor fan and sealed unit LED light fitting

Final Cost was £7,345.00 to include all construction costs. All works were VAT exempt and there were no architect fees as we handled this case 'in-house'.

4. Awsworth

OT recommendations – Access in and out of the property, door widenings, re-working of the existing Ground Floor shower so it is suitable for a wheelchair user + a rise and fall kitchen sink

The Applicant: a permanent wheelchair user

Tenure: Owner Occupier (lives alone)

Grant Eligibility: The applicant had contribution of £823.75 to pay towards the cost of the works as assessed by the DFG financial assessment.

Synopsis: The applicant lives in an extended semi-detached house and lives on the ground floor using the 2nd reception room as their ground floor bedroom. Some of the existing door openings are too narrow for the electric wheelchair, they were unable to get out of the house in the wheelchair. The ground floor shower room was not suitable for a wheelchair user. We handled this case 'in-house' so we had no additional architect fees. The applicant had tried to move house to a bungalow, but was not able to do this, so Broxtowe worked with Nottinghamshire County Councils Adult Social Care Team and we designed the adaptations, put the work out to tender, awarded the grant and supported the contractor and applicant whilst works were ongoing.

Existing Photographs





Changes in levels adjacent to the front door



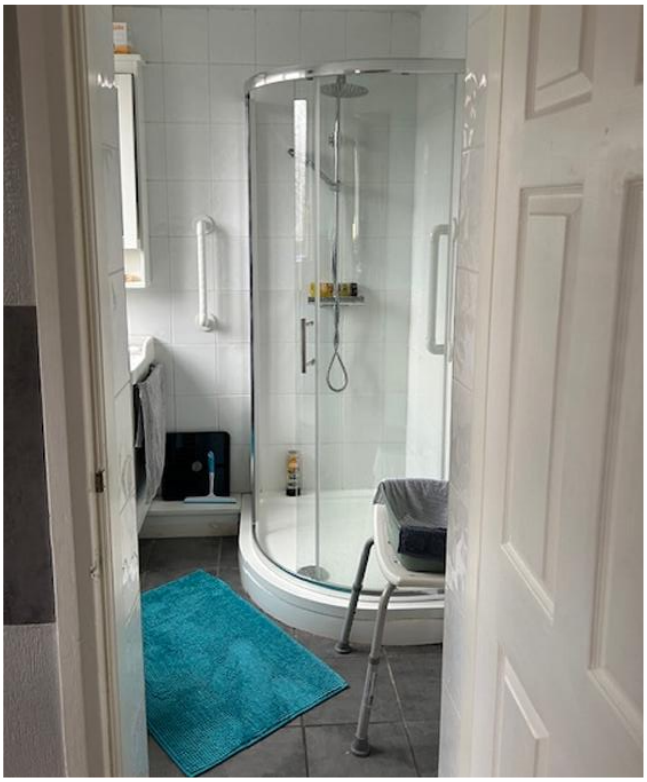
Door from Hall to GF Bedroom



Door from Hall to Reception Room



Doorway from Hall to Porch

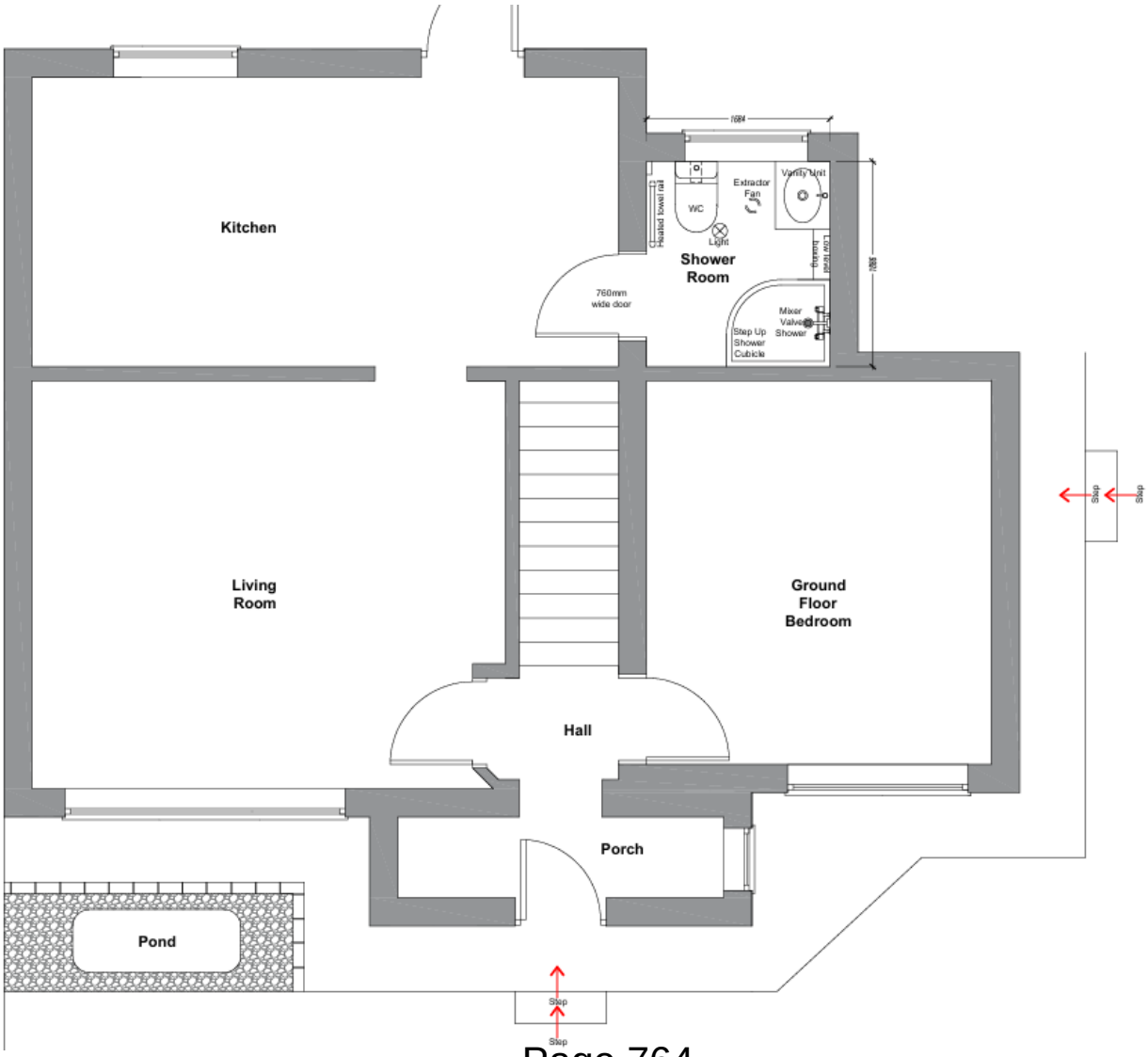


Shower room off kitchen (step-up shower tray)

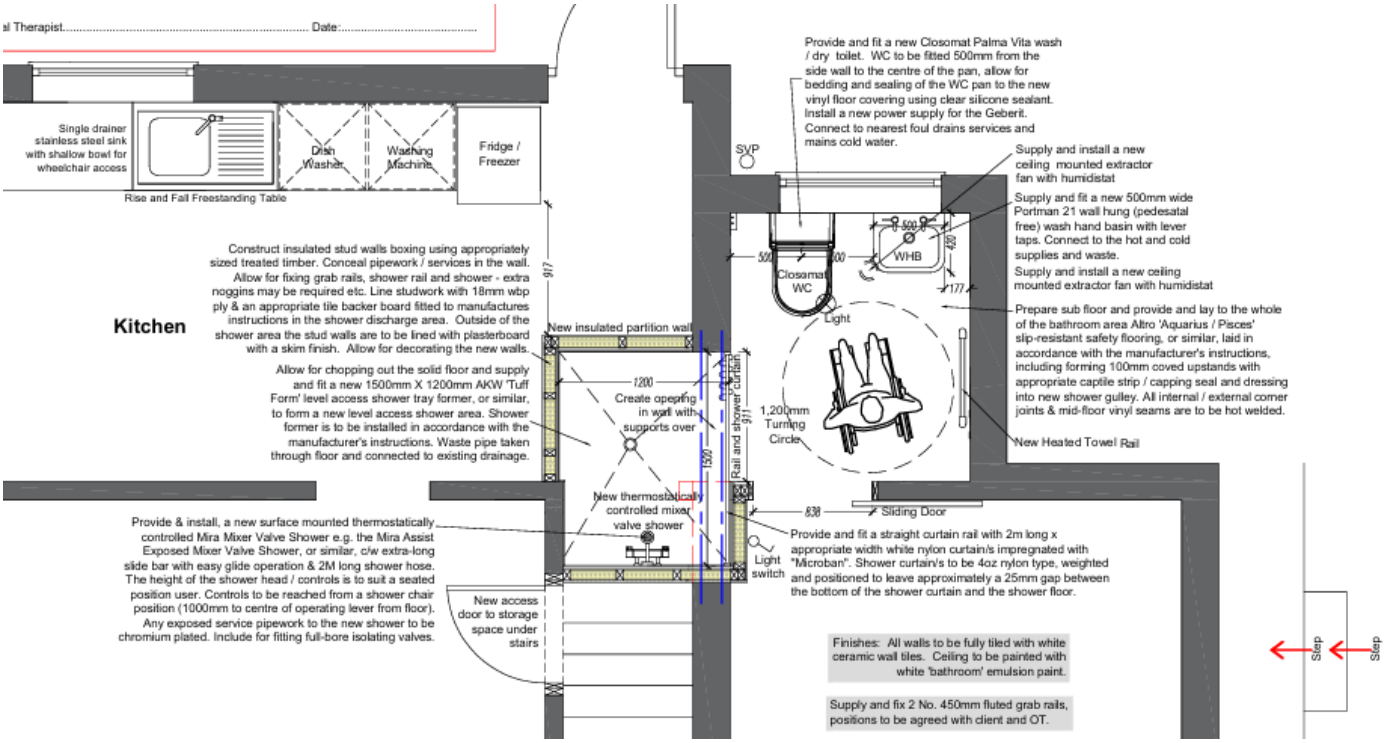


Vanity Unit & Close Coupled WC

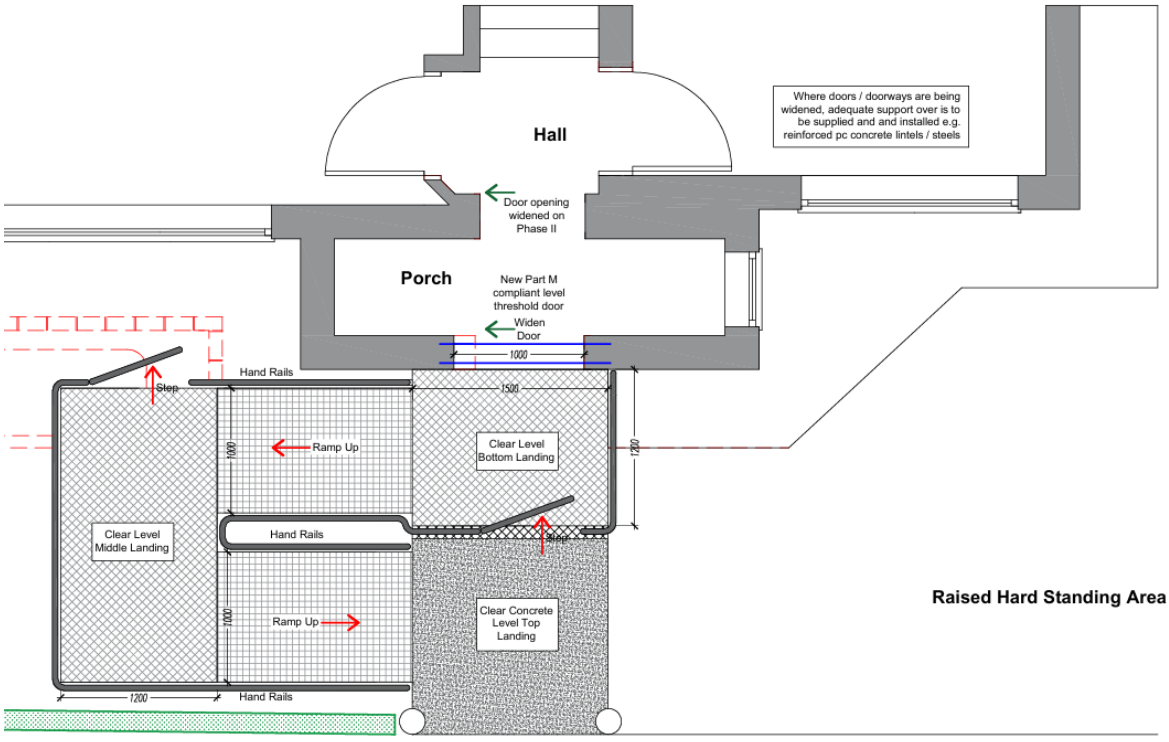
Existing Ground Floor Plan



Plan for the New Enlarged GF Shower Room + Kitchen Adaptation



Plan for the new concrete ramp for access in and out of the house



Photographs of Completed Works - Access Adaptations



Widened door to GF Bedroom



Widened door to Reception Room



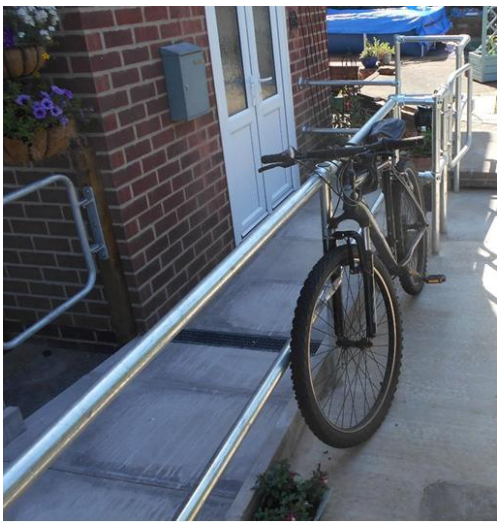
Widened doorway Hall to Porch



New concrete ramp with handrails



New double leaf front door & gated access for ambulant visitors



New concrete ramp with handrails and gated access (LHS) for window cleaning

Photographs of Completed Works - Level Access Shower, wash/dry WC & Wash Basin



Wash / Dry WC and semi-pedestal wash hand basin



New Level Access Shower



Rise and fall kitchen sink for use by the applicant and visitors / carers

Final Cost was £41,722.00 to include all construction costs. All works were VAT exempt and there were no architect fees as we handled this case 'in-house'. If an Architect would have been used that would have added >£5,000.00 to the project value.

Customer Feedback

We also have examples of positive customer feedback. One example is summarized below.

Officers were courteous and professional and knowledgeable about grant procedures and able to answer questions. The grants officer and grants caseworker were excellent in helping us understand and plan what was needed. The grants caseworker was clear and explained the process very well. The fitting of the stairlift was delayed until the bathroom had been installed. This was managed and explained very well and much appreciated. The contractors were helpful

and went out of their way to make a very big job as least disruptive as possible, I would highly recommend them and are very satisfied.

It was a brilliant service which has enabled my mother-in-law to stay in the home she loves.

We were extremely impressed by the help we received from the grants caseworker who explained the process well and answered questions. The grants officer provided a great plan for the bathroom. The outcome means that the applicant can use the stairs and access a shower which has meant she can stay in her home.

Cabinet **21 July 2026**

Report of the Portfolio Holder for Housing

Fit and Proper Person Policy - Private Sector Housing Licensing

1. Purpose of Report

To seek approval for a policy to consider whether applicants applying for a licence or involved in the management of a licensed property are considered to be fit and proper. This is in accordance with our core housing priority to create 'a good quality home for everyone' improving the standard or private rented properties.

2. Recommendation

Cabinet is asked to RESOLVE that the Fit and Proper Person Policy - Private Sector Housing be approved.

3. Detail

Under Parts 2 and 3 of the Housing Act 2004 ("the Act"), the Council must be satisfied that any proposed licence holders or managers are fit and proper persons. If the Council is not satisfied, it must refuse to grant a licence unless suitable alternative management arrangements are agreed.

The majority of criteria are standard considerations, but the Fit and Proper Person Policy provides transparency to applicants about the criteria that will be applied when applying for a licence and when a licence refusal or revocation will occur.

This policy does not apply to Residential Caravan Site owners requiring a licence under the Mobile Homes Act 2013, which is subject to its own policy. This is attached at **Appendix 2.**

4. Key Decision

This report is a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012 as it is significant in terms of its effects on communities using or providing licensed housing in all wards and electoral divisions in the Council's area.

5. Updates from Scrutiny

To be provided.

6. Financial Implications

   The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

   There are no additional financial implications for the Council with nominal development costs being contained within existing budgets.

7. Legal Implications

   The comments from the Head of Legal Services were as follows:

   The Fit and Proper Person policy sets out how the Council intends to meet its legal duty under the relevant legislation referred to in the policy. Without such policy the Council could be open to legal challenge if a licence is issued to an individual who has not been given the due consideration.

8. Human Resources Implications

   There are no comments from the Human Resources Manager.

9. Union Comments

   There are no Union comments.

10. Climate Change Implications

    There are no specific climate change implications contained within the report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    As this is a new policy an Equality Impact Assessment is included in the **Appendix 2** to this report.

13. Background Papers

    Nil.

Appendix 1

Policy: Fit and Proper Person – Private Sector Housing

Authors: Head of EH, L, PSH & PSH Manager
Division: Private Sector Housing – Environmental Health
Date: 26th May 2026
Review Date: July 2031

Contents

Policy: Fit and Proper Person – Private Sector Housing 1
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1. Purpose.

1.1 Under Parts 2 and 3 of the Housing Act 2004 ("the Act"), the Council must be satisfied that:

- the proposed licence holder is a fit and proper person and the most appropriate person to hold the licence; and
- any proposed manager of the property is a fit and proper person to be involved in its management.

1.2 Where the Council is not so satisfied, it must refuse to grant a licence unless suitable alternative management arrangements can be agreed.

1.3 A licence may be revoked if, at any time, the Council is no longer satisfied that:

- the licence holder remains a fit and proper person; or
- the property is being managed by fit and proper persons.

1.4 The purpose of the fit and proper person test is to protect occupiers, neighbours and the wider community by ensuring that those responsible for licensed properties demonstrate integrity, competence and a record of lawful and responsible conduct.

2. Scope

2.1 This policy applies to all properties requiring a licence under:

- Part 2 (HMO licensing).

This policy would also be applicable to all properties requiring a licence under Part 3 (Selective Licensing) of the Housing Act 2004, if any such schemes are introduced.

2.2 The policy applies to licence holders, proposed licence holders, managers and any other persons the Council considers to be involved in the management of a licensable property.

2.3. This policy does not apply to residential caravan sites licensed under the Mobile Homes Act 2013 as a separate policy and process exists for this function.

3. Policy

3.1 Persons "Involved in the Management"

3.1.1 A person is considered to be "involved in the management" where they have a significant role in:

- repairs and maintenance;
- compliance with legal requirements;
- management of tenancies or occupants;
- handling of rent, deposits or personal data;
- dealing with complaints, antisocial behaviour or emergencies.

3.1.2 This may include owners, directors, partners, managers and agents. It will not normally extend to staff with purely administrative or incidental contact unless their role gives rise to relevant concerns.

3.1.3. Where the licence holder and manager are different persons, the Council will make a separate assessment for each.

3.2. The Fit and Proper Person Assessment

3.2.1. In determining whether a person is fit and proper, the Council will have regard to **any information it considers relevant**, including (but not limited to) whether the person has:

- Committed any offence involving fraud (including benefit fraud), violence, drugs or offences listed in Schedule 3 of the Sexual Offences Act 2003;
- Practised unlawful discrimination on grounds of sex, colour, race, ethnic or national origin or disability in or in connection with any business
- Ever contravened any provision of any laws relating to Housing, Public Health, Environmental Health or Landlord and Tenant law (including harassment and illegal eviction)
- Owned or managed an HMO or house which has been subject to enforcement action under Part 1 of the Housing Act 2004
- Had a licence refused or revoked, or breached licence conditions;
- Owned or managed a property which has been the subject of an interim management order, special interim management order, or final management order under the Housing Act 2004
- Acted otherwise than in accordance with approved codes of practice or recognised standards;

- Ever been convicted or received a Civil Penalty Notice for non-compliance of a Statutory Notice under Housing, Environmental Health, Landlord and Tenant, Public Health, Health and Safety, Building Regulations or Planning Laws
- Been in control of a property where works have been carried out in default
- Failed to cooperate with enforcement action or demonstrated disregard for legal obligations.
- Been subject to prosecution and/or Civil Penalty action for housing related offences

3.2.2 A person subject to a banning order under the Housing and Planning Act 2016 will not be considered fit and proper.

3.2.3. A person on the 'Rogue Landlord Database'.

3.2.4. This list is not exhaustive. The absence of a specific matter does not prevent the Council from finding a person not fit and proper.

3.3. Associated and Formerly Associated Persons

3.3.1. In determining whether a person is fit and proper, the Council may take into account the conduct of any person or body associated or formerly associated with the applicant or proposed manager, where relevant.

3.3.2 This may include, but is not limited to:

- family members, partners or former partners;
- business partners or associates;
- companies, partnerships or limited liability partnerships;
- directors, officers, shadow directors, persons with significant control, shareholders or beneficial owners;
- parent, subsidiary or successor companies;
- managing agents or contractors acting on behalf of the applicant.

3.3.3 The Council may take such associations into account where it considers that:

- the applicant or proposed manager is acting as a proxy, front or nominee for another person or company;
- control or influence over the property or its management may be exercised by a person or body that would not be considered fit and proper; or

- the association is otherwise relevant to the effective, lawful and responsible management of the property.

3.3.4. A licence may be refused or revoked on this basis where there is evidence that:

- an associated or formerly associated person or body has engaged in conduct relevant to the fit and proper person assessment; and
- that conduct materially affects the applicant's or proposed manager's suitability to hold a licence or manage the property.

3.3.5. The Council will consider the nature, extent and relevance of any association on a case-by-case basis. The existence of an association alone will not automatically result in refusal.

3.4. Decision-Making and Weighting of Evidence

3.4.1. Each case will be determined on its individual merits. The Council will exercise its discretion reasonably and proportionately.

3.4.2 In assessing relevance and weight, the Council may consider:

- the seriousness and nature of the conduct;
- risk posed to occupiers or others, particularly vulnerable persons;
- patterns of behaviour or repeated non-compliance;
- how recent the conduct was;
- evidence of remediation, learning or sustained compliance;
- any aggravating or mitigating circumstances.

3.4.3. Isolated or minor breaches will not automatically result in refusal. However, repeated failings, serious misconduct, or disregard for legal duties are likely to weigh heavily against an applicant.

3.4.4. The Council will not be bound by previous findings of fitness and may reassess fitness at any time during the life of a licence.

3.5. Outcome and Appeals

3.5.1. Any person not being a Fit and Proper Person as per section 3.2, will be refused a licence. Appeals against a decision to refuse or revoke a licence can be made to a First Tier Property Tribunal.

3.6. Duration of Findings

3.6.1. Where a person is found not to be fit and proper, this will normally be considered to remain the case for up to five years.

3.6.2. Any subsequent application will be assessed afresh. The burden will rest with the applicant to demonstrate suitability.

3.7. Relationship to Enforcement Policy and Data Sharing

3.7.1. This policy operates alongside the Council's Private Sector Housing Enforcement Policy and the Private Sector Housing Civil Penalty Policy.

3.7.2. Information relevant to the fit and proper person test will be shared with other statutory bodies, including the 'Rogue Landlord Database', other local authorities and the police, where lawful and necessary for the prevention or detection of crime or the exercise of statutory functions.

4. Policy Considerations

4.1 Risk

4.1.1. Failure to have a policy on the assessment of Fit and Proper Licence Applicants under Parts 2 and 3 of the Housing Act 2004, could result in the Council issuing a licence to a person who has not been given due consideration, as required by the legislation. This policy has been developed in conjunction with the other Authorities within Nottinghamshire to improve the consistency of approach.

4.2 Assertions

4.2.1. It is asserted that the Policy covers all of the minimum statutory requirements of the Act and Associated Guidance.

4.3 Responsibilities

4.3.1. It is the responsibility of all Officers to adhere to the policy.

5. Related Policies, Standards and Guidelines

This policy should be read in conjunction with the Private Sector Housing Enforcement Policy, the Private Sector Housing Civil Penalties Policy, the Caravan Site Fit and Proper Person Policy (if applicable) and the relevant procedures, standards and guidelines relating to Private Sector Housing Enforcement functions.

6. Enforcement

Any **user** or **administrator** found deliberately contravening this policy **may** be subject to disciplinary action and, where appropriate, legal action.

7. Review

This document will be reviewed every 5 years as a minimum or wherever there may be a change in legislation or influencing circumstances.

8. Document Attributes

Document Information

Information Type	Document Information
Title	Fit and Proper Person Policy – Private Sector Housing
Identifier	Fit and Proper Person Policy – Private Sector Housing
File Location	Private Sector Housing
Description	Policy - Fit and Proper Person Private Sector Housing Licensing
Keywords	Fit and Proper Person, HMO, Mandatory, Licensing
Format	Accessible, Word
Author	Head of Environmental Health, Licensing and Private Sector Housing
Owner	Private Sector Housing Manager
Classification	Open
Date Created	May 2026
Last Review Date	Approval July 2026
Next Review Date	July 2031
Date to Dispose	Not applicable

Document Approval

Date	Name & Job Title of Approver(s)	Version
May 2026	Suzanne Hickey – Head of Environmental Health, Licensing and Private Sector Housing	1.0

Document History

Date	Summary of Changes	Version
May 2026	Document Created.	1.0

Distribution

Private Sectors Housing Team

Coverage

Private Sector Housing Team

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Appendix 2

EQUALITY IMPACT ASSESSMENT (EIA)

Directorate: **Housing, Asset Management, Environmental Health and Communities.**

Lead officer responsible for EIA: **Suzanne Hickey**

Name of the policy or function to be assessed: **Fit and Proper Person Policy – Private Sector Housing**

Names of the officers undertaking the assessment: **Suzanne Hickey**

Is this a new or an existing policy or function? **New specific policy, existing function.**

---

1. What are the aims and objectives of the policy or function?

To outline the circumstances and criteria for failing to be a fit and proper person under parts 2 and 3 of the Housing Act 2004 to hold a licence.

---

2. What outcomes do you want to achieve from the policy or function?

To provide transparency in the criteria applied when determining or revoking a relevant licence

---

3. Who is intended to benefit from the policy or function?

Occupiers of Private accommodation requiring a licence to be held – Houses in Multiple Occupation (HMO) and licence holders providing clear criteria.

---

4. Who are the main stakeholders in relation to the policy or function?

Occupiers of HMO's, HMO licence holders, the Council.

---

5. What baseline quantitative data do you have about the policy or function relating to the different equality strands?
None.

6. What baseline qualitative data do you have about the policy or function relating to the different equality strands?

Occupiers of rented accommodation may be vulnerable for a variety of factors. Some occupiers have health and financial issues. Whilst some HMO's are occupied by students and professionals only requiring short term accommodation, HMO's are increasingly being used as accommodation for the homeless, those who cannot afford to rent an entire property, asylum seekers and those recently granted settled status and those requiring temporary accommodation.

7. What has stakeholder consultation, if carried out, revealed about the nature of the impact?

None. It is a duty to refuse a licence to someone who is not determined to be fit and proper, so the policy reinforces that requirement and ultimately benefits those using such accommodations.

8. From the evidence available does the policy or function affect or have the potential to affect different equality groups in different ways?
There will be more benefit to those occupying Licensed properties (HMO's) and therefore those vulnerable groups identified above as using this accommodation.

Does the policy or function target or exclude a specific equality group or community?
No this policy benefits anyone who uses this accommodation by

Does it affect some equality groups or communities differently? If yes, can this be justified?
All those benefitting will be affected in the same way.

Is the policy or function likely to be equally accessed by all equality groups or communities? If no, can this be justified?
Yes.

Are there barriers that might make access difficult or stop different equality groups or communities accessing the policy or function?
No it is applicable for all HMO licence applications.

Could the policy or function promote or contribute to equality and good relations between different groups? If so, how?
Not applicable.

What further evidence is needed to understand the impact on equality?
None.

9. On the basis of the analysis above, what actions, if any, will you need to take in respect of each of the equality strands? None – any of those equality strands using licensed HMO accommodation will benefit in the same way.

Age:

Disability:

Gender:

Gender Reassignment:

Marriage and Civil Partnership:

Pregnancy and Maternity:

Race:

Religion and Belief:

Sexual Orientation:

10. Head of Service:
I am satisfied with the results of this EIA. I undertake to review and monitor progress against the actions proposed in response to this impact assessment:

Signature of Head of Service: Suzanne Hickey

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Appendix 3

BROXTOWE BOROUGH COUNCIL

MOBILE HOMES ACT 2013

Mobile Homes Fit and Proper Persons Policy

September 2021

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Introduction

The Mobile Homes (Requirement for Manager of Site to be Fit and Proper Person) (England) Regulations 2020, require the manager of a site to be a Fit and Proper Person ("the Regulations"). Local authorities are accordingly required to introduce a fit and proper person test for mobile home site owners, or the person appointed to manage the site, unless they are eligible for an exemption under the Regulations (i.e. it is a non-commercial, family occupied site under Regulation 3).

The Regulations, made on 23 September 2020, allow local authorities to receive applications from site owners, or the person appointed to manage the site, from 1 July 2021 up to and including 30 September 2021.

A local authority must be satisfied that the site owner "*is a fit and proper person to manage the site"* or, if the owner does not manage the site, *"that a person appointed"* to do so by the site owner *"is a fit and proper person to do so"* or has*,* with the site owner's consent*, "appointed a person to manage the site*."

Where a site owner or their manager fails the fit and proper person test, and they are unable to identify and appoint a suitable alternative manager, who must pass the fit and proper person assessment, the local authority can instead appoint a person to manage the site, but only with the consent of the site owner.

Principally, the fit and proper person test applies to a "relevant protected site". A relevant protected site is a site, which requires a licence and which is not solely for holiday purposes or is otherwise not capable of being used all year round. The fit and proper person requirement will ensure that site owners, or their managers, have integrity and good character. Additionally, it provides the safeguard that such individuals will not pose a risk to the welfare or safety of persons occupying mobile homes on the site i.e. park home owners.

Matters for Consideration

When considering whether a person is 'fit and proper' the local authority must have regard to the suitability of the person concerned ('the relevant person'). Schedule 3 paragraphs 2 to 4 of the Regulations make reference to those matters that **must** be considered by the local authority as part of any application. These include;

Whether the relevant person is able to secure the proper management of the site. This includes, but is not limited to;

a) compliance with the site licence;

b) the long term maintenance of the site

c) whether the relevant person has sufficient level of competence to manage the site;

d) the management structure and funding arrangements for the site or proposed management structure and funding arrangements. The local authority may want to ensure that the applicant has a robust management plan, this should also be reviewed to ensure it addresses the following issues: the pitch fee

payment, proximity of the manager to the site, manager's contact details for residents (including out of office and emergency contact details), the complaints procedure, maintenance, staffing, and refuse removal.

Other matters to be considered are whether the relevant person has:

e) committed any offence involving fraud or other dishonesty, violence, firearms, arson or drugs or listed in Schedule 3 to the Sexual Offences Act 2003 (offences attracting notification requirements);

f) has contravened any provision of the law relating to housing, caravan sites, mobile homes, public health, planning or environmental health or of landlord and tenant law;

g) has contravened any provision of the Equality Act 2010 in, or in connection with, the carrying on of any business;

h) has harassed any person in, or in connection with, the carrying on of any business;

i) is, or has been within the past 10 years, personally insolvent;

j) is, or has been within the last 10 years, disqualified from acting as a company director;

k) whether the relevant person has the right to work within the United Kingdom;

l) whether any other local authority has rejected an application for the responsible person to be included in a register;

m) is a member of any redress scheme enabling complaints to be dealt with in connection with the management of the site (if this is in place).

The local authority may also have regard to the conduct of any person associated or formerly associated with the relevant person (whether on a personal, work or other basis) if it appears to the authority that that person's conduct is relevant to the question of whether the relevant person is a fit and proper person to manage the relevant protected site or proposed relevant protected site (as the case may be). A relevant associate could be defined as any individual who may have played a part, directly or indirectly, in a decision or action, which has had an impact on residents' rights, or the quiet enjoyment of their homes.

Local authorities have a duty to investigate any conduct which could amount to harassment and any evidence obtained should be reviewed to determine whether it is sufficient to be used to prosecute a site owner. Local authorities may also rely on convictions by the courts as evidence of harassing behaviour which would reduce the risk of the local authority being successfully challenged on any refusal to approve an applicant on this basis.

The local authority may have records of previous harassment complaints made against a site owner or their manager. Even if no action was taken on these complaints it is still advisable that these be taken into consideration in the fit and proper person determination. These complaints may identify further potential risks and can also provide an indication of potential underlying problems with the management of the site or the site owner's lack of experience/skills in dealing with customers. Local authorities may also wish to address any underlying issues by attaching conditions to the individual's entry on the register.

It is advisable that the site is managed by an applicant based in the UK and a management structure would be unlikely to be suitable if the applicant is an individual, or a company (including its directors), which does not reside or have a permanent UK address. This is because there may complex issues as a result of this, such as needing the court's permission to serve a claim in a foreign country. The applicant's interest in the land will also have an important impact, as would their financial standing, management structures and competence, all of which could contribute to the overall assessment of their suitability to manage the site effectively.

The local authority must consider whether the applicant has sufficient funds (or has access to sufficient funds) to manage the site and comply with licence obligations. Evidence of these funds should be readily available.

Another consideration is if funding is through a third party (including an associated company), the local authority should be wary if this is not disclosed as this will impact on the local authority's ability to deem whether the application is financially viable.

The Regulations are drafted widely giving the opportunity for local authorities to take into consideration other relevant matters. However, a local authority should be cognisant that poor management practices do not affect a person's conduct, unless they are also a breach of the criminal or civil law. A person cannot be deemed unfit due to conduct, simply because of poor management, although that factor is highly relevant to determining any question of suitability or competence. However, all conduct is relevant in relation to the person's fitness to hold a licence and/or manage the particular mobile home site.

Applications

A specific application form will be required.

Applications must be accompanied by a criminal record check and proof of right to work in the UK. Criminal Records Certificates must be issued under section 113A (1) of the Police Act 1997 and will be required where: (a) the Relevant person is an individual and (b) for each individual in relation to whom the applicant is required to provide information for example, a site manager or individuals A, B, C or D as outlined above. The Criminal record certificate may be either basic or enhanced, at the discretion of the local authority and it is proposed that Broxtowe require an enhanced criminal record check. The certificate must have been issued no more than six months before the date of the application. It is incumbent upon the site owner to ensure that any certificates provided meet this requirement.

Once an application has been received the local authority may:

a) Grant the licence unconditionally;
b) Grant the licence subject to conditions;
c) Reject the application.

In order to comply with the fit and proper person requirement a site owner must at least two months before the period (e.g. 5 years) comes to an end submit a new application for the person (or alternative) to be included in the register.

Decisions

The fit and proper person test is aimed at ensuring that the person managing the site is competent and any conditions should relate directly to a person's ability to secure the proper management of the site.

Where a person has contravened legislation, or committed the specific offences listed (e – g) it is not recommended that conditions are set in relation to those matters as any condition cannot be reversed by requiring the person to perform a specific task (e.g. fraud).

As soon as is reasonably practicable after a full and complete application is received (including the relevant fee) the local authority must make a decision on the application and either;

a) Where the decision is to grant the licence unconditionally and to include the relevant person on the register for 5 years, serve a final decision notice on the applicant or;
b) Otherwise serve a preliminary decision notice on the applicant.

Once a full and completed application has been received by the authority, the nominated case officer will review the information and obtain any further information deemed relevant to the application. A consultation in respect of the applicants will take place with the neighbouring authorities, the Police, the fire authority and any authority where a licence is currently held.

The nominated officer will then prepare a case file for review by the relevant and authorised senior officer. The authorised senior officer may authorise that an application be granted unconditionally or subject to conditions.

Where an application is to be rejected a preliminary decision notice will be issued and the matter will be referred to the Licensing and Appeals Committee. Refusal/Rejection will only take place if discussions with the site owner/applicant cannot agree an alternative manager.

Removal from the Register - Local authorities must use their judgement when determining whether to review an entry and consider any subsequent actions are required. It is recommended that any such decision should be related to the person being a fit and proper person rather than, for example, site licensing issues which are governed separately.

If, after a person is included in the register, and new evidence relevant to the person's inclusion becomes available, the local authority may decide to:

a) remove the person from the register;
b) impose a condition on the inclusion of the person in the register (whether or not there are conditions already imposed;
c) vary a condition; or
d) remove a condition.

If the local authority decides to take any further action above, the local authority must serve a notice of any proposed action on the occupier.

Appeals

Any preliminary decision notice will be in accordance with the Regulations and will provide the applicant with 28 days, beginning with the day after that day on which the notice was served, to make written representations to the authority.

Once written representations have been received the authority may then make a final decision which may include approving an application subject to specific conditions. The local authority is obliged to consider and take any representations it receives into account before making a final decision.

Where the authority may seek to remove a relevant person from the register or to impose further conditions a notice of proposed action will be issued in accordance with the Regulations. Again, any relevant person may make written representations within 28 days of such a notice being issued.

The local authority may withdraw or amend;

a) A preliminary decision notice before the service of the final decision notice;
b) A final decision notice before the decision to which it relates takes effect or:
c) A notice of proposed action before the proposed action is taken

A person on whom a final decision notice is served may appeal to a First-tier Tribunal (FTT) against;

a) Any decision to include the relevant person on the register for an effective period of less than 5 years,
b) Any decision to include the relevant person on the register subject to conditions and;
c) Ant decision to reject the application.

A person on whom a notice of action is served may appeal to the FTT against;

a) And decision to remove the relevant person from the register;
b) Any decision to impose a condition on the inclusion of the relevant person in the register and;
c) Any decision to vary a condition

No compensation may be claimed for loss suffered, pending the outcome of the appeal, in consequence of the local authority making a final decision or taking action relevant to regulation 8(1)(a)(b) or (c).

Register

The Regulations require a local authority to establish and keep up to date a register of persons they are satisfied are fit and proper persons to manage a relevant protected site within their area and to make the register open to inspection by members of the public at the offices of the local authority during normal office hours.

The authority must also publish the register online and the contents of the register will be in accordance with the Regulations.

A person's inclusion in the register has effect for a maximum period of 5 years.

Details of the rejected application (not the name of the individual applicant rejected) will remain on the register until a successful fit and proper person application is made in respect of the owner or manager of the site.

Fees

Regulation 10 permits the local authority to charge a fee for the processing of applications and this fee is contained within the Caravan Site Fees Policy (as updated). This is to cover the cost of processing applications and will be reviewed annually.

The authority may also decide the amount and frequency of any additional payments required by way of an annual fee. The authority does not intend to charge an additional annual fee at this time (an annual fee for site licensing is already in place) and this will be subject to review. Any fee that is applied will be done so in accordance with the fees policy and relevant guidance.

Where the authority has, with the occupier's consent, appointed a person to manage a site, the local authority will recover from the occupier the reasonable costs incurred or to be incurred in making the appointment in accordance with Regulation 10.

Offences

An owner (occupier) of land commits an offence if he causes or permits any part of it to be used as a relevant protected site (which falls within the scope of the Regulations) without the manager of the site being registered with the local authority as a fit and proper person.

An applicant also commits an offence if he;

a) Withholds information from a registration application or;
b) Includes false or misleading information in a registration application or;
c) Fails to comply with a condition imposed under Regulation 6(2)(b) or Regulation 8(1).

An owner (occupier) of land who is guilty of an offence is liable on summary conviction to a level 5 fine (unlimited).

Were an owner (occupier) of land who holds a site licence in respect of that land contravenes the relevant Regulations, the FTT may, on application by the authority, make an order revoking the site licence in question on eth day specified in the order.

Where:

(a) An owner (occupier) of land who holds a site licence in respect of that land is convicted of an offence under Regulation 11 for a contravention of the fit and proper person requirement and;
(b) Has been convicted on two or more previous occasions of the offence in relation to that land,

The Court before which the occupier is convicted may, on application by the local authority, make an order revoking the site licence in question.

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Community Safety

Annual Food Safety Service Plan and Occupational Safety Work Programme 2026-2027

1. Purpose of Report

To advise Members and seek approval for the annual Food Safety Service Plan and Occupational Safety Work Programme 2026-2027. This is in accordance with our core priority to create a "greener, safer, healthier Broxtowe where everyone prospers."

2. Recommendation

Cabinet is asked to RESOLVE that the Annual Food Safety Service Plan 2026-2027 and the Annual Occupational Safety Work Programme 2026-2027 be approved.

3. Detail

The Food Standards Agency Framework Agreement sets out what the Food Standards Agency expects from local authorities in their delivery of official controls on food law. It includes the requirement to prepare a statutory Food Service Plan and prescribes in detail which areas of the service should be covered by the Plan.

The Food Safety Service Plan describes how the service is discharged and details the numbers, types, and priority ratings of the Borough's food premises, the frequencies of planned interventions, sampling programmes, health promotion activities, reactive work, including responding to food complaints, food hazard warnings and investigating cases of infectious disease. As well as containing data from the last financial year, the Plan contains information on proposals for undertaking duties in 2026/27.

The Food Safety Service continues to have completed all of the inspection programme for 2025-2026 in accordance with the Food Standards Agency Code of Practice, Practice guidance and the Food Hygiene Rating Scheme Brand Standard.

A full copy of the proposed Broxtowe Borough Council Statutory Food Service Plan 2026/27 is attached in **Appendix 1**.

The Occupational Safety Work Programme describes the Occupational Safety and Health Enforcement proposals for undertaking duties in 2026/27.

Under Section 18(4) of the Health and Safety at Work etc. Act 1974, local authorities must make 'adequate arrangements for the enforcement' of health

and safety law. The National Local Authority Enforcement Code explains what is meant by 'adequate arrangements' and sets out the risk-based, proportionate approach local authorities should follow when planning and delivering interventions.

The Code provides flexibility for local authorities to address local issues while supporting national priorities identified by HSE. These priorities are detailed in LAC 67/2 Setting Local Authority Priorities and Targeting Interventions.

The proposed Occupational Safety and Health Enforcement Work Programme 2026/2027 is attached at **Appendix 2.**

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

Not applicable.

6. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

There are no additional financial implications to consider with the cost of operational activity being contained within existing budgets. Any significant budget implications in the future, over and above virement limits, would require approval by Cabinet.

7. Legal Implications

The comments from the Head of Legal Services were as follows:

Failure to have an agreed plan in place is contrary to the Food Law Code of Practice (England) (amended March 2021) requirements and can be a point of failure if the Council receives an audit by the Food Standards Agency. The plan is subject to amendment and review in accordance with good practice, guidance and legal controls.

8. Human Resources Implications

There are no comments from the Human Resources Manager.

9. Union Comments

Not applicable.

10. Climate Change Implications

    There are no climate change implications contained within the report.

11. Data Protection Compliance Implications

    This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

    An equality impact assessment is not required as there is no change to an existing policy.

13. Background Papers

    Nil.

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Appendix 1

Broxtowe Borough COUNCIL

Food Service Plan 2026/27

May 2026

1.0 Introduction

Broxtowe Borough Council (the Council) is committed to ensuring that food produced, sold or consumed in the district is safe to eat and does not pose a risk to public health.

This Food Service Plan sets out how the Council will deliver the elements of food safety and hygiene for which the Council has enforcement responsibility.

The requirement to have a Food Service Plan is laid down by the Food Standards Agency (FSA) in its Framework Agreement on Local Authority Food Law Enforcement. The FSA was established in April 2000 as an independent monitoring and advisory body and is the central competent authority responsible for food safety in the UK.

The COVID-19 Recovery Plan, in operation between August 2021 and March 2023 resulted in the bunching of inspections due to the rapid completion of visits by Officers and Consultants during the recovery period. This has continued over the last few years. Officers continue to work on the bunching by moving inspections forward during the course of the year. This work will continue in the coming years until there is a more even spread of inspections across each 12-month inspection period.

As in the last few years, the previous 12 months saw a high number of new food premises registrations. These included a large proportion of home-based activities such as cake bakers and a high turnover of some of the takeaway type premises. Many proposed new food businesses are proving challenging to inspect due to delays in opening and in the complexity of the type of food and manner of preparation. Whilst there are a lot of domestic cake bakers still registering, people are more regularly wanting to cook food for takeaway at home and make and process novel foods which have specific food safety challenges, especially in a domestic setting.

2.0 Food Safety Service Aims and Objectives

2.1 Aim

To maintain, and where possible improve, the health and wellbeing of residents and visitors to the Borough of Broxtowe and the success of local food businesses by ensuring the safe production, processing, handling, storage, distribution and sale of food in the district.

2.2 Objectives

- To ensure that at all levels of the food chain, all food prepared, sold or offered for sale is wholesome and fit for human consumption.
- To operate the service in accordance with the relevant Code of Practice, practice guidance and the requirements of the Food Standards Agency.
- To keep accurate records of all food enforcement activities and maintain an accurate register of food businesses in the Borough.

- To carry out food hygiene interventions in accordance with the minimum inspection frequencies and to standards determined by the Food Standards Agency.
- To participate in the National Food Hygiene Rating Scheme providing information about businesses to facilitate customer choice.
- To encourage standards of hygiene higher than the minimum acceptable in law.
- Working towards increasing overall food hygiene ratings for food businesses, thereby protecting food consumers within the Borough.
- To aid local businesses export food and drink to the EU and worldwide by providing export health certificates.
- To deal with food alerts in accordance with Food Standards Agency guidance.
- To investigate complaints relating to food premises or food sold in the Borough of Broxtowe.
- To investigate notified cases of food and water borne illness and take effective action to control the spread of infection.
- To sample and risk-assess private water supplies.
- To effectively and efficiently meet the needs of the public and businesses using our service and to respond positively to challenges.
- To respond to planning and licensing consultations as a statutory consultee.
- To participate in Safety Advisory Groups (SAGs) to provide early advice on food safety matters at larger events.
- To increase the knowledge of food handlers and the general public about the principles and practice of food hygiene.
- To support and promote schemes and initiatives which improve the health of customers of food businesses where they are viable.
- To undertake surveillance, inspection and sampling of foods and food contact materials including imported food in accordance with national food sampling surveys taking action to remove unsafe food from sale.
- To provide appropriate responses to public health emergencies.
- To work with partners to maintain a safe community.

3.0 Links to Broxtowe's Corporate Plan

The Council's priorities are detailed in the Corporate Plan 2025-2029

The Food Service Plan accords with the Council's Vision which is: *"A greener, safer healthier Broxtowe where everyone prospers."*

The Food Service Plan contributes directly to the Business Growth and Health priorities in the Corporate Plan which are:

"Invest in our towns and our people" and "Healthy and Supported Communities."

4.0 Organisation structure and staffing

The food safety service is within the Environmental Health Team. A permanent Senior Environmental Health Officer has managed the food safety service since May

2023. This has helped to reduce the number of direct reports to the Head of Environmental Health, Licensing and Private Sector Housing. The Environmental Health remit also includes occupational health and safety, environmental protection, private sector housing, dealing with public health emergencies, animal, skin piercing and scrap metal licensing and registrations, private water supplies and camping and caravan sites. The wider Licensing function (taxis, liquor, street collections, massage and special treatments, sexual entertainment venues and gambling etc.) has also been under the Head of Environmental Health, Licensing and Private sectors Housing's management since 1st July 2021.

The establishment provides for eight suitably qualified Officers who are able to undertake food safety, occupational health and safety, licensing, registrations, private water supply and infectious disease investigation duties. This comprises of the Head of Environmental Health, Licensing and Private Sector Housing, six Environmental Health Officers (Senior EHO, 3 full-time EHOs, 2 part-time EHOs) and one part-time Environmental Health Technical Officer (who is qualified to the Higher Certificate in Food and Food Premises Inspection standard).

The food safety service has been carrying a vacancy for a full-time EHO since May 2025, which impacted on the service over the last twelve months. This position has just been filled, with the new officer starting in June 2026. One part-time EHO post has been vacant since April 2026 due to retirement. The service is looking to fill this gap in the team as soon as possible. There are also other vacancies in the Private Sector Housing Team and the Environmental Protection Team with further recruitment ongoing.

To assist the Environmental Health Team and to start to future plan for the service, a Degree Apprentice Environmental Health Officer was appointed and started in September 2025. She spends one day a week at university and assists the wider team, while gaining practical experience the rest of the week. The service will look to expand training opportunities in the coming years in an effort to provide additional qualified officers. The profession is currently suffering from a shortage of qualified officers and an aging workforce so additional work needs to be done at a local and national level to ensure sufficient officers are trained for the future.

Administration support is provided by another department, which also supports other teams. As of April 2025, the resource allocation for food safety duties equates to 3.25 Full Time Equivalent Officers (FTE).

5.0 Employee Development and Competency

All Officers are subject to regular appraisal and participation in competency assessments and authorisation frameworks for the relevant service areas. Specific Continuing Professional Development (CPD) requirements as required by the Food Law Code of Practice, membership of the Chartered Institute of Environmental Health or equivalent professional bodies are also adhered to. It is essential that Officers are up to date with legislation and enforcement issues and the service utilises free and low-cost training courses available in addition to completing specific job training as required and utilising tools such as the FSA's Competency Framework for food Officers and cascade training through the team as appropriate.

The Environmental Health section is responsible for all aspects of food hygiene and safety, private water supplies and infectious disease control, as well as a wide range of other duties including wider public health duties, occupational health and safety, animal activity licensing, the registration of skin piercing activities, consultations for planning, licensing applications and temporary event notices.

All Officers within Environmental Health work generically, providing a full range of services within the field. All Officers are expected to prioritise a workload that includes a range of cases both of a proactive and reactive nature and a risk profile suitable for their role.

In terms of food safety services, responsibilities include:

- Inspection of food premises in accordance with the Food Law Code of Practice.
- Registration of food businesses.
- Approval and inspection of businesses producing foods of animal origin.
- Investigation of complaints about food and hygiene at food premises.
- Promotion of documented food safety systems.
- Participation in, and promotion of, the National Food Hygiene Rating Scheme, including requests for re-ratings.
- Sampling of food for microbiological examination.
- Investigation of food borne and water borne infection.
- Investigation of food poisoning outbreaks.
- Imported food control.
- Sampling.
- Food alerts (food hazard warnings).
- Provision of advice and guidance including participation in events that promote food safety and supporting new and proposed food businesses.
- Provision of Health Certificates as requested.

Whilst undertaking food safety interventions, Officers also carry out the following additional functions:

- Hazard spotting in relation to health and safety issues.
- Priority based health and safety inspections.
- Waste disposal arrangement checks.

As part of the provision of a complete service, the section works in conjunction with the following partner organisations:

- The Food Standards Agency (FSA).
- Department for Environment Food and Rural Affairs (DEFRA).
- The Health and Safety Executive (HSE).
- The UK Health and Security Agency (UKHSA).
- The UKHSA Food, Water and Environmental Microbiology laboratory (FWEM) based in York.
- Other local authorities including Public Health, Trading Standards etc. as appropriate.

- Public Analyst.

The Council is also represented on the following working groups:

- Nottinghamshire Food Liaison Group
- Nottinghamshire Food Sampling Group
- Nottinghamshire Licensing and Registration Subgroup
- Nottinghamshire Health and Safety Group
- Nottinghamshire Regulatory Managers Group
- Health Protection Strategy Group
- Local Health Protection Board
- Local Health Resilience Forum
- Midland Health and Safety Group
- East Midlands Work Related Deaths Forum
- Nottinghamshire Tobacco Control Forum
- Nottinghamshire Health Partnership
- Ad-hoc outbreak control teams

These groups also contribute to wider regional and national working groups.

5.1 Quality Assurance

The following monitoring arrangements are in place:

- Paper/computer-based checks in respect of food hygiene inspections.
- Shadow inspections for new employees, existing employees, contractors and those returning to food work.
- Regular 1:2:1s with all team members and team meetings.
- Peer review/audit of enforcement action in respect of food safety work.
- Regular consistency exercises set by the Food Standards Agency to check for variations between Local Authorities.

6.0 Enforcement Protocol

The enforcement protocol has been approved by the Council and reflects the intention of the service to meet the requirements of criminal investigation laws and the Regulators Compliance Code.

7.0 Demands on the Food Service

The following paragraphs outline the various demands on the service and the profile of the premises within the Borough.

7.1 Number of Premises

As of 13th April 2026, there were 857 food premises on the Broxtowe food database. The tables in the **Appendix** show:

- The spread of Food Hygiene Ratings over 2025/26; and
- The Food Hygiene Rating distribution by food business type.

7.2 Interventions at Food Establishments

The Council uses the Food Hygiene Intervention Rating Scheme as detailed in the Brand Standard for the National Food Hygiene Rating Scheme and the Food Law Code of Practice to determine the frequency that food premises should be inspected. This ensures that all premises are inspected at an appropriate minimum interval determined by their individual risk rating. The risk rating is based on the nature of food handling undertaken, the level of compliance with legal requirements and confidence in food safety management systems. The minimum frequency varies from six monthly to three years depending on the assessed risk category.

As of 13th April 2026, the breakdown of food businesses by category in the Borough is shown in table 1.:

Priority	Premises category	Premises score	Frequency of inspection	Total number of premises in category
A	**High**	92 or higher	6 months	3
B	**High**	72 to 91	12 months	39
C	**High**	52 to 71	18 months	142
D	**Low**	31 to 51	24 months	304
E	**Low**	0 to 30	Alternative Interventions (36 months)	267
Unrated	**Other**		New premises within 28 days of registration	15
Unrated	**Other**		New premises outside 28 days of registration	87
Outside Programme	**Other**			0
Total				857

Table 1: Food businesses by risk category

Additional interventions and Officer time are directed at those businesses, which fail to meet basic food safety compliance. Ratings of businesses meeting the criteria contained in the Brand Standard are published on the Food Standards Agency's website as part of the National Food Hygiene Rating scheme.

A specific database is used to generate and record interventions. This database is also used to extract data to upload to the national Food Hygiene Rating Scheme website, the Food Hygiene Local Authority Return to the FSA (completed twice a

year end of September and end of March), the Health and Safety Executive/Local Authority Enforcement Liaison Committee (HELA) return to the Health and Safety Executive (HSE) and other statutory returns (e.g. Drinking Water and Animal activities licensing returns to Department of Food and Rural Affairs (DEFRA), Noise return to the Chartered Institute of Environmental Health (CIEH)).

The premises score includes weightings for complex processes, type of food handled, number of consumers, vulnerable groups, condition of the structure of the premises and confidence in management etc. Category A premises are usually manufacturers or premises with a poor compliance history. Category E premises are usually retailers of packaged ambient food or wet sales pubs etc.

Inspections with a Hygiene Rating of 0, 1 and 2 (on a scale of 0 - Requires Urgent Improvement to 2 – Improvement Necessary) and businesses in categories A and B usually generate a revisit. Additional revisits are generated at the request of the food business operator to review their food hygiene rating, where there are customer complaints, for new business start-ups and where major alterations or refurbishments are planned. Following the Food Standards Agency's guidance for the delivery of the Food Hygiene Rating Scheme, the Council adopted a cost recovery charge in August 2023 for those businesses who request a revisit to re-rate their Food Hygiene rating following receipt of a Rating of less than 5 at a routine inspection.

In 2025/26, the Council saw the highest number of new food premises registrations recorded in a twelve month period (177 in total). These included a large proportion of home-based activities such as cake bakers and a high turnover of some of the takeaway type premises. This continues to pose a challenge to identify, assess likely risk and inspect in a timely manner.

Additional complications with many of these new registrations include:

- Food Business Operators (FBO) with limited food safety knowledge and experience.
- Businesses that register and are not ready to trade for months.
- Domestic businesses that want to operate more like a takeaway cooking food to be sold hot.
- Domestic businesses wanting to make and process complex and novel foods such as fermented, pickled, dried and smoked products of animal and non-animal origin.

All these complications add to the Officer time required providing advice and guidance before businesses can be inspected and awarded a Food Hygiene Rating. These trends continue and it is predicted that both the high number of new food premises and their complexity will continue into subsequent years due to cost of living pressures and competition in the food sector.

7.3 Food and Water Sampling

Sampling of food, including imported food, water, and materials in contact with food is carried out as part of a county, regional and national sampling programme.

Sampling will also be undertaken, where appropriate, in relation to food poisoning outbreaks and food complaints, where formal action is being considered. Food samples for microbiological examination are sent to the Public Health Laboratory at York. Other food samples and private water supplies are sent to the Public Analyst.

7.4 Control and investigation of outbreaks and infectious diseases related to food, water, travel or recreational activities.

The service has a policy to investigate any suspected cases of infectious disease to minimise spread of infection. A matrix exists regarding the cases to be investigated, and liaison takes place with The UK Health and Security Agency (UKHSA). Samples are currently sent to the laboratory at Birmingham for analysis.

7.5 Food Safety Alerts, Product Recall Information and Allergy Alerts.

The policy of this service is to respond appropriately to food alerts and intelligence, to investigate food safety incidents and generate food alerts as necessary in accordance with the requirements of the Food Safety Code of Practice and associated Practice Guidance.

7.6 Health and Food Safety Education and Promotion

The service participates, where resources permit, in targeted local and national activities and interventions.

8.0 Service Data for 2025/26

8.1 Food Hygiene Interventions in 2025/26

Interventions undertaken (by category of premises). Please note these relate to proactive inspections. Other interventions to food businesses were also undertaken. Work to identify risk and prioritise newly registered food businesses will continue to be undertaken in 2026/27 to ensure new higher risk businesses are inspected earlier.

A	B	C	D	E	Unrated	TOTAL
5	38	87	166	91	94	481

Table 2: Food Hygiene Interventions

As of 31 March 2026, there were zero (0) overdue programmed inspections for Category A-E food premises and 102 new businesses that were yet to be inspected and risk rated, 87 of which were over 28 days – further details of these can be found in sections 9.4 and 11.

The Food Service received a total of 177 new food business registrations during 2025/26. This is higher than the 124 new food business registrations received during 2023/24 and 142 received during 2024/25.

In the final four months of the year, priority was given to completing the programmed inspections due for 2025/26, whilst ensuring unrated businesses were triaged and inspected if found to be potentially high risk.

8.2 Number of revisits in 2025/26

There were 21 revisits undertaken, of which 10 of these were paid for re-rating revisits. Additional revisits were also undertaken to monitor particular issues identified during interventions.

8.3 Requests for Service 2025/26

Requests for service include concerns regarding the condition of the premises, or food with microbiological or physical contamination.

Hygiene of premises	Food complaints	Food safety Advice	Export certificates
50	59	50	0

Table 3: Requests for Service

8.4 Enforcement Action (Premises) 2025/26

Informal Warnings (including emails and letters)	Over 420
Improvement Notices	0
Hygiene Emergency Prohibition Notices	0
Hygiene Emergency Prohibition Orders	0
Voluntary Closure	2
Seizure, Detention, Voluntary surrender of food	1
Simple Cautions	0
Prosecutions	0

Table 4: Enforcement Actions

Officers used a graduated approach, where possible, to ensure compliance with food safety requirements, which resulted in very little formal enforcement action being required. All actions are risk-based and explained to businesses. All food businesses that receive a low Food Hygiene Rating are monitored and revisited to ensure improvements are made and that standards do not slip further.

Hygiene Emergency Prohibition Notices are served where an imminent risk of injury to health has been identified, and action is required to stop a food business or process from operating. Any notices served must be followed by an application to the Magistrates' Court within three working days for an Order confirming such action.

8.5 Food and Water Sampling

A total of 41 food and environmental samples were taken in 2025/26. The UKHSA requested water sampling from 2 domestic settings and a commercial glamping setting with spa pools following cases of folliculitis and legionella separate cases of legionella. This led to dozens of environmental swabs and water samples being taken between May and November of 2025. As a result of the poor standards found, two Health & Safety Prohibition Notices and four Health & Safety Improvement

Notices were served on the company. The case has led to the administration of a simple caution for breaches of health & safety legislation.

The sampling programme included products identified through national and regional studies. Adverse sample results were identified and followed up with revisits and re-sampling as appropriate.

8.6 Control and Investigation of outbreaks and infectious diseases related to food, water, travel or recreational activities in 2025/26

22 reports of suspected or confirmed cases of infectious disease were notified to the service in 2025/26, which required investigation. This is a 39% decrease compared to 2024/25 (36 reports).

Cases investigated comprised of salmonella, cryptosporidium, giardia, hepatitis, legionella and suspected illness following consumption of food and water.

8.7 Food Safety Education and Promotion in 2025/26

The Council continued to provide advice to new and existing businesses throughout the year, as well as to events being run in the borough.

Nottinghamshire County Council's HOT (Healthy Options Takeaway) Award has been put on indefinite hold due to a lack of resources at a County level and a limited uptake with food businesses due to cost-of-living pressures. The Council will participate with the County as and when the scheme is re-launched or replaced.

9.0 Performance Monitoring

The Food Service aspect of Environmental Health has a number of performance indicators which are monitored as part of the Community Safety Business Plan.

These are:

- Food Inspections – High Risk - Inspect all businesses due for inspection in accordance with a pre-planned programme based on risk. Target 100%.
- Food Inspections – Low Risk - Inspect all businesses due for inspection in accordance with a pre-planned programme based on risk. Target 100%.
- Food - Respond to specific complaints about practices procedures and conditions which may prejudice health in the short term within one working day of receipt, and non-urgent complaints / general requests for advice within five working days of receipt. Target 98%.
- Infectious Disease - Respond to notifications within one working day and requests for advice and information as soon as practicable within five working days of receipt. Target 100%.

Performance information in respect of these indicators for previous years also given below.

9.1 Performance Trends

2021/22, 2022/23, 2023/24, 2024/25 and 2025/26

Year	Percentage of programmed high-risk inspections completed	Percentage of programmed low risk inspections completed
2021/22	95%	84.5%
2022/23	100%	100%
2023/24	100%	100%
2024/25	100%	100%
2025/26	100%	100%

Table 5: Inspections Achieved

9.2 Response to Service Requests within Target Times

Service Type	2021/22	2022/23	2023/24	2024/25	2025/26
Food Safety	93%	97%	99%	98%	98%
Infectious Disease Notifications	100%	100%	93%	94%	100%
Consultations	96%	98%	97%	98.5%	99.6%

Table 6: Service Request Response Times Trends

A continued increase in consultations were received as business activities varied and diversified. All service requests were assessed and prioritised to ensure urgent enquiries were dealt with more quickly.

9.3 Broadly Compliant Premises

85% of premises were at least broadly compliant with a Food Hygiene Rating of 3 – Generally Satisfactory or higher. The figure is down on 2024/25 (88%) and 2023/24, (89%) due to lower Food Hygiene Ratings at a number of premises following inspection but mainly due to an increase in unrated businesses (new business registrations that haven't yet received a full food hygiene inspection for a variety of reasons).

9.4 Proposed Inspection Programme 2026/27

Priority	Premises category	Programmed inspections due 2026/27	Other inspections due 2026/27
A	High	6	-
B	High	38	-
C	High	89	-
D	Low	104	-

Priority	Premises category	Programmed inspections due 2026/27	Other inspections due 2026/27
E	Low	42	-
Unrated	Other	-	At least 120
Overdue Inspections		0	102 due and overdue unrated
Total		279	222

Table 7: Inspections Programmed 2026/27

Programmed inspections for the year are significantly down, mainly due to the majority of low risk premises being due and inspected in the last two years. This gives the service the opportunity to catch upon unrated businesses. There continues to be a significant number of new business premise registrations being submitted to the Council. All new businesses registering, get signposted to advice to help them commence trading safely. New food registrations are triaged to prioritise visits to higher risk operations. The large number of new registrations, along with other factors (see 7.2) means that, whilst there is an intervention within 28 days of registration, a large proportion cannot be inspected within this time frame. Some registrations are received many months before a business starts operating and therefore cannot be inspected within 28 days of registering.

10.0 Issues for 2026/27

- To continue with the timely intervention of food safety interventions.
- To catch up on inspecting due and overdue unrated premises.
- To ensure active participation in the FSA's ongoing proposed new delivery models, to modernise food safety enforcement and ensure it is sustainable for the future. There are no dates published for when these changes are likely to be implemented.
- Participation in the FSA's other proposed changes to food safety delivery – streamlined professional competency framework and recruitment and retention of qualified food safety officers.
- To continue to participate in national consistency exercises relating to the work of the team.
- To continue to monitor the resource provided to food safety enforcement to ensure it is adequate to meet the demands of the service, including new food business interventions, in a timely manner.
- To continue to provide effective food and registration interventions prioritising high-risk and non-compliant premises.
- To continue to carry out follow up interventions to 0,1 and 2 rated premises to secure improvements.
- To continue to provide a competent team to deal with these areas of service delivery.
- To continue to support the Degree Apprentice EHO and look to the possibly appointing an additional Apprentice in 2027/28.
- To continue to use the full range of enforcement tools available to protect the safety, health and welfare of visitors, residents and workers within the Borough including targeted health and safety interventions.

- To continue to participate in the National Food Hygiene Rating Scheme.
- To continue to implement changes to regulation of animal licensing activities and ensure that employees meet the qualification requirements to inspect these activities.
- To continue to participate in the development of new enforcement requirements for cosmetic treatments and additional animal activities licensing (e.g. primates).
- To continue to support businesses importing and exporting food products.
- To continue to deal with matters of evident concern at food premises (health and safety, waste management etc.) and signpost businesses to other guidance, teams and agencies as appropriate,
- To continue to work with partner agencies to share intelligence, have a consistent approach to enforcement and identify joint training and working opportunities.
- To continue to participate in Safety Advisory Groups.
- To continue with the implementation of mobile working devices (tablets) to improve efficiency and effectiveness of the intervention programme.

11.0 Identification of variation from the Service Plan

There are an increased number of newly registered premises that have not received an inspection within 28 days of registering, as detailed in sections 7.2 and 9.4. All of these businesses have been triaged and have received relevant information to assist in their start up.

Resource must continue to be allocated to monitoring premises with a Food Hygiene Rating of 0, 1 or 2 to ensure improvements in standards is achieved.

Resource must continue to be allocated to dealing with outbreaks of food and water borne illness.

New legislative requirements for the proposed regulation of beauty treatments will require training and assessing these premises will be resource intensive.

Continued priority of reactive work including notifiable accident, workplace ill health and occupational safety interventions is also necessary.

The service will embed the newly appointed EHO into the team and look to fill the other vacancy as soon as possible

Appendix. Tables 7.1 & 7.2 Food Hygiene Rating information for businesses in Broxtowe

Table 7.1 Food Hygiene Rating Scheme – Distribution over 2025/26

FHRS Rating	Aug - 25	Sep - 25	Oct - 25	Nov - 25	Dec - 25	Jan - 26	Feb - 26	Mar - 26	Apr - 26
5 - Very good	543	541	542	551	551	540	538	530	519
4 - Good	93	90	95	94	95	96	90	90	89
3 - Generally satisfactory	59	61	61	59	60	58	59	58	57
2 - Improvement required	10	9	10	10	9	9	8	7	6
1 - Major improvement required	8	8	5	6	4	4	4	4	6
0 - Urgent improvement required	0	0	1	1	1	1	1	1	1
Total rated establishments	713	709	714	721	720	708	700	690	678
Establishments with rating of 3 or better	695	692	698	704	706	694	687	678	665
Awaiting inspection	74	85	80	82	87	93	98	107	115
Exempt	23	23	23	23	23	23	23	21	21
Sensitive	11	13	13	14	14	14	14	13	15
Excluded	38	37	40	39	38	38	40	39	40
Total establishments	859	867	870	879	882	876	875	870	869

Appendix. Tables 7.1 & 7.2 Food Hygiene Rating information for businesses in Broxtowe

Table 7.2 Percentage breakdown of distribution of rated establishments

FHRS rating	Restaurant/ Cafe/ Canteen	Hotel / Guest House	Small Retailer	Supermarket/ Hypermarket	Caring Premises	Restaurants and Caterers - Other	Distributors / Transporters	Pub/Club	Retailer - Other	Take - Away	School/ College	Mobile Food Unit	Total
5 - Very good	67.3	100.0	72.6	95.2	83.1	84.1	100.0	76.6	78.9	59.7	94.9	95.5	76.5
4 - Good	17.0	0.0	17.9	4.8	12.3	8.0	0.0	19.5	10.5	12.5	5.1	4.5	13.1
3 - Generally satisfactory	13.2	0.0	8.3	0.0	4.6	6.8	0.0	2.6	5.3	22.2	0.0	0.0	8.4
2 - Improvement required	1.9	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.6	1.4	0.0	0.0	0.9
1 - Major improvement required	0.6	0.0	1.2	0.0	0.0	0.0	0.0	0.0	2.6	4.2	0.0	0.0	0.9
0 - Urgent improvement required	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total rated establishments	100	100	100	100	100	100	100	100	100	100	100	100	100
Establishments with rating of 3 or better	97.5	100.0	98.8	100.0	100.0	98.9	100.0	98.7	94.7	94.4	100.0	100.0	98.1

Appendix 2

Broxtowe Borough COUNCIL

Occupational Safety and Health Enforcement Work Programme 2026/27

April 2026

1.0 Introduction

Broxtowe Borough Council (the Council) is committed to ensuring that the health, safety and welfare of workers and those affected by work activities carried out in the Borough is protected by promoting and securing compliance with health and safety legislation in those premises where we are the enforcing authority.

Under Section 18(4) of the Health and Safety at Work etc. Act 1974, local authorities (LAs) must make 'adequate arrangements for the enforcement' of health and safety law. The National Local Authority Enforcement Code explains what is meant by 'adequate arrangements' and sets out the principles LAs should follow.

The Code requires LAs to adopt a risk-based, proportionate and consistent approach when planning and delivering interventions. Using the guidance and tools provided for priority planning helps LAs meet these requirements and ensures alignment with both national priorities and local intelligence.

The Code provides flexibility for LAs to address local issues while supporting national priorities identified by HSE. These priorities are detailed in LAC 67/2 Setting Local Authority Priorities and Targeting Interventions

- Annex A: Focuses on **national priorities.**
- Annex B: Highlights **sector-specific problems**. Some topics, such as noise, violence and aggression, work-related stress (WRS) and musculoskeletal disorders (MSDs), cut across multiple sectors and can complement proactive interventions based on local intelligence.

Neither Annex A nor Annex B should be treated as prescriptive or exhaustive lists. They are intended to guide work planning and support HSE's strategic objectives of maintaining safety and reducing work-related ill health.

This document sets out the Councils priorities and approach for 2026/2027

2.0 Links to Broxtowe's Corporate Plan

The Council's priorities are detailed in the Corporate Plan 2025-2029.

The Health and Safety Enforcement Priorities accords with the Council's Vision which is: *"A greener, safer healthier Broxtowe where everyone prospers."* and contributes directly to the Business Growth and Health priorities in the Corporate Plan which are:

"Invest in our towns and our people" and "Healthy and Supported Communities."

3.0 Occupational Health and Safety Enforcement Service Priorities

3.1. Investigation of Incidents, Notifiable Accidents and Complaints (Reactive Visits)

Certain accidents and incidents arising from work activities must be reported to the enforcing authority under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). Other concerns may be refereed to us by employees, members of the public and other enforcement agencies.

Risk-based selection criteria are applied when deciding which incidents and complaints are suitable for investigation. Whilst all reported complaints and incidents may not meet the criteria for investigation, they may help identify and provide evidence of local issues which could form the basis of future local priorities and workstreams.

3.2 Annual National Priorities 2026/2027

The national priorities are determined using HSE's current regulatory intelligence and reviewed annually.

In 2026/27 Broxtowe will consider national priorities when planning and carrying out visits. Lack of programmed maintenance is particularly considered during other interventions and electrical safety and gas safety at food and licensing visits.

3.3 Locally Identified Priorities

In 2026/27 Broxtowe's local priorities will include;

- **Skin Piercing Activities.**
  Inspections will be carried out of newly registered practitioners and premises carrying out skin piercing activities to ensure operators are compliant with the relevant byelaws, as well as all applicable health and safety legislation.

- **Beauty Treatments**
  Inspections will be carried out of a proportion of our licence holders carrying out beauty treatments licensed under The Nottinghamshire County Council Act 1985, to ensure they are being operated:
  a) in accordance with the licence conditions,
  b) in a suitable environment and a hygienic manner to protect practitioners and clients; and
  c) in accordance with applicable health and safety legislation.

  This will include inspections of higher risk activities such as lasers or where a new licence is applied for.

- **Hot Tubs and Spas pools**
  Participation in the national UKHSA sampling project in spa pools.

In 2026/27, Broxtowe investigated a skin condition arising in a visitor following a hot tub at holiday accommodation. This identified failures in staff training and procedures to safely manage the provision of this activity and resulted in the service of immediate prohibition notices, improvements notices, numerous visits and sampling of the facilities and the issue of a Simple Caution.

- **Safety Advisory Groups**
  To continue to participate in Safety Advisory Groups for local events.

3.4 Matters of Evident Concern (MEC's)

Matters of Evidence Concern are defined as: "matters that create a risk of serious personal injury or ill-health and which are observed (i.e., self-evident) or brought to the inspector's attention".

Matters of Potential Major Concern (MPMCs) are defined as: those which have a realistic potential to cause either multiple fatalities or multiple cases of acute or chronic ill-health"

Officers will continue to identify matters of evident concern during any other proactive or reactive visit – such as programmed food hygiene inspections and take appropriate enforcement action where required.

Any MECs, MPMCs, or new and emerging issues identified which may have national significance will be reported to HSE

4.0 Team Capacity and Competency

There are currently nine suitably qualified and warranted Officers within the Environmental Health Team which spends approximately 1.5 FTE hours on health and safety enforcement activities. The Environmental Health remit also includes food safety, environmental protection, private sector housing, dealing with public health emergencies, animal, skin piercing and scrap metal licensing and registrations, private water supplies and camping and caravan sites.

All Officers are subject to regular appraisal and participation in competency assessments and authorisation frameworks for the relevant service areas. Specific Continuing Professional Development (CPD) requirements as required by the Regulators Development Needs Assessment (RDNA), membership of the Chartered Institute of Environmental Health or equivalent professional bodies are also adhered to. It is essential that Officers are up to date with legislation and enforcement issues and the service utilises free and low-cost training courses available in addition to completing specific job training as required and utilising tools such as the HSE topic webinars and cascade training through the team as appropriate.

5.0 Consistency

The Council is represented on the following working groups relevant to health and safety matters, including improving consistency, sharing best practice and contributing to wider regional activity:

- Nottinghamshire Licensing and Registration Subgroup
- Nottinghamshire Health and Safety Group
- Nottinghamshire Regulatory Managers Group
- Health Protection Strategy Group
- Midland Health and Safety Group
- East Midlands Work Related Deaths Forum

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Cabinet **21 July 2026**

Report of the Portfolio Holder for Environment and Climate Change

Annual Air Quality Status Report 2026

1. Purpose of Report

To advise Members of the latest Air Quality Status Report which has been submitted to the Department of Food Environment and Rural Affairs (DEFRA). This is in accordance with the Council's Corporate Priority of Environment – to protect the environment for the future and Community Safety – a safe place for everyone.

2. Recommendation

Cabinet is asked to RESOLVE that the Air Quality Status Report 2026 be approved.

3. Detail

Each year, DEFRA requires all local authorities in England to produce and submit an Annual Status Report (ASR) in respect of air quality for the preceding calendar year by 30 June each year.

The key findings of the 2026 ASR are that:

- The nitrogen dioxide results show at the air quality levels are consistently below the objective of 40µg/m^3 for all of the 38 monitoring sites.
- The Council has been cited as an example of good practice and on the Defra website Good Practice Examples: Annual Reports | LAQM
- Defra Modelling results show PM_{10} and $PM_{2.5}$ below the AQO
- The Boroughwide smoke control order came into force in June 2025
- The new cremators and associated plant including abatement system at Bramcote Crematorium have been completed and a new permit issued.

The annual bias corrections used in the report are not usually available until at least April each year, and the required information from Nottinghamshire County Council is not available until June, which can create challenges in the timing and the submission if the ASR to DEFRA and bringing the ASR to Cabinet.

Once submitted, the ASR is appraised by technical experts appointed by DEFRA and an Appraisal Report is issued which either accepts or rejects the ASR and provides additional audit observations. The report as attached has been submitted to DEFRA and is currently awaiting appraisal feedback.

The Air Quality Action Plan relevant to the Council's direct actions is now included into the Air Quality project strand of the Climate Change and Green Futures Action Plan and updated there accordingly. The Council's ASR is approved by the Portfolio Holder for Environment and Climate Change and the Director of Public Health before submission. Cabinet will be advised of the feedback received from DEFRA later in the year.

The ASR outlines all the actions that the Council and other stakeholders have completed or are taking forward in pursuit of improving air quality. These actions have all helped deliver the observed improvements in air quality and should contribute to the continuation of improved air quality.

The actions contained in the ASR also link strategically with county and regional action to improve air quality contained in the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030.

The ASR will be published on the Council's website. As a public facing document, it also contains a summary of the ways in which members of the public can take their own action to help improve air quality.

4. Key Decision

This report is not a key decision as defined under Regulation 8 of the Local Authorities (Executive Arrangements) (Meetings and Access to Information) (England) Regulations 2012.

5. Updates from Scrutiny

There are no updates from scrutiny.

6. Financial Implications

The comments from the Interim Deputy Chief Executive and Section 151 Officer were as follows:

There are no additional financial implications at this stage, with operational costs being contained within existing budgets. There could be additional costs for the Council if real time air monitoring continues and/or action was taken to expand or increase monitoring. Any significant budget implications going forward, over and above virement limits, would require approval by Cabinet.

7. Legal Implications

The comments from the Head of Legal Services were as follows:

Part IV of the Environment Act 1995 sets out statutory provisions on air quality. Section 82 provides that Councils shall review the air quality within their area. Section 83 requires Councils to designate Air Quality Management Areas (AQMAs) where air quality objectives are not being achieved, or are not likely to

be achieved (i.e. where pollution levels exceed the air quality objectives) as set out in the Air Quality (England) Regulations 2000. Where an area has been designated as an AQMA, Section 84 requires councils to develop an Air Quality Action Plan (AQAP) setting out the remedial measures required to achieve the air quality standards for the area covered within the AQMA. The Department for Environment, Food and Rural Affairs (DEFRA) has provided statutory guidance in the form of the Local Air Quality Management Policy Guidance. The guidance gives particular focus to so-called 'priority pollutants' such as Nitrogen Dioxide (NO2) and so-called 'Particulate Matter' (PM10 and PM2.5) which are relevant to district councils. Councils are required to submit an Annual Status Report (ASR) to DEFRA in order to report the progress being made in achieving reductions in concentrations of emissions relating to relevant pollutants below air quality objective levels. The completed report is submitted to the Secretary of State (DEFRA) for consideration.

8. Human Resources Implications

There are no comments from the Human Resources Manager.

9. Union Comments

The are no Union comments.

10. Climate Change Implications

The comments from the Assistant Director (Environment) were as follows:

The actions outlined in the air quality status report, support and reinforce the programme of activities identified in the Climate Change and Green Futures Strategy and delivery programme. These actions have already contributed to favourable environmental outcomes, such as the improvement of air quality, the reduction of carbon emissions and a contribution towards mitigating the worst impacts of climate change. Moreover, future actions resulting from Local Air Quality Management in the Borough will continue to deliver beneficial results in the future.

11. Data Protection Compliance Implications

This report does not contain any OFFICIAL(SENSITIVE) information and there are no Data Protection issues in relation to this report.

12. Equality Impact Assessment

As this is no change to policy, an equality impact assessment is not required.

13. Background Papers

Nil.

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2026 Air Quality Annual Status Report (ASR) for Broxtowe Borough Council

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management

June 2026

Information	Broxtowe Borough Council Details
Local Authority Officer	Kate Ratcliffe
Department	Environmental Health
Address	Council Offices, Foster Avenue, Beeston, Nottingham NG9 1AB
Telephone	0115 9177777
E-mail	health@broxtowe.gov.uk
Report Reference Number	BBC/AQ/ASR/2026
Date	June 2026

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Broxtowe Borough Council. Other departments at Broxtowe Borough Council were consulted. This ASR is supported and agreed externally by the following officers and departments:

- Ellie Jaycock - Transport Planning and Programme Development Place Department, Nottinghamshire County Council
- Richard Wellings – Bus Policy, Partnership and Major Projects, East Midlands Combined County Authority.
- Jo Marshall - Public Health and Commissioning Manager, Public Health Adult Social Care and Health, Nottinghamshire County Council

This ASR has been approved by:

Councillor Tyler J Marsh, Portfolio Holder for Environment and Climate Change, Broxtowe Borough Council.	**T Marsh**

This ASR has been signed off on behalf of the Director of Public Health and Communities by:

Jo Marshall, Public Health & Commissioning Manager, Public Health, Nottinghamshire County Council	 Nottinghamshire County Council

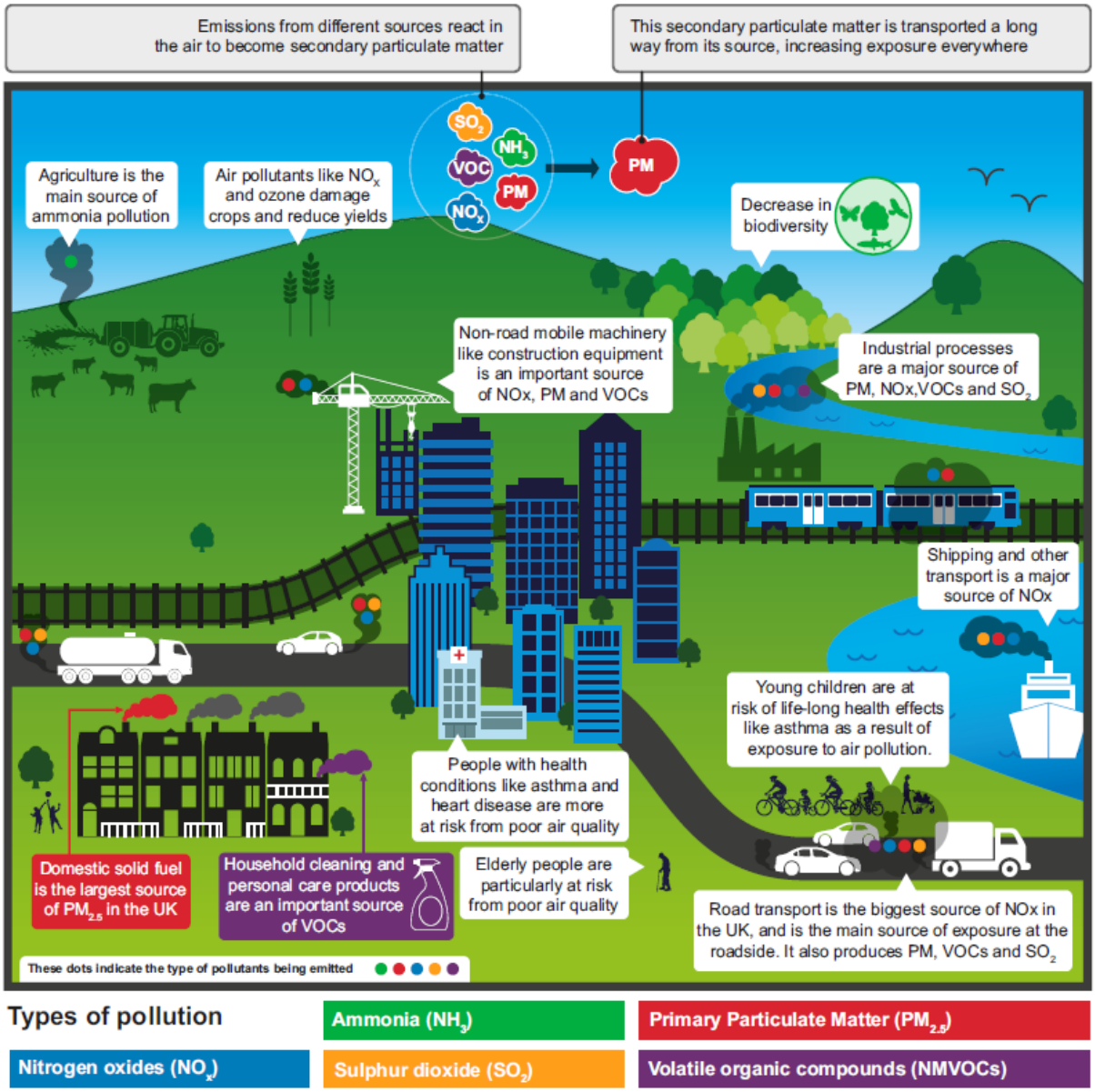
If you have any comments on this ASR, please send them to Kate Ratcliffe at:

Broxtowe Borough Council,
Council Offices,
Foster Avenue, Beeston,
Nottingham,
NG9 1AB.
Telephone: 0115 917 7777
Email at: health@broxtowe.gov.uk

Executive Summary: Air Quality in Our Area

What is Air Pollution and where does it come from?

Air pollution is generally defined as any type of particulate (dust) or gaseous substance (e.g. Oxides of Nitrogen) that is emitted into the atmosphere due to the combustion of fuels such as coal, oil, gas, petrol, diesel and the burning of wood or natural gas from domestic central heating boilers or power stations. When these fuels are combusted, they are emitted into the atmosphere, and they affect the air quality within the United Kingdom (UK).



Source – Clean Air Strategy 2019, DEFRA Clean Air Strategy

Table ES 1 provides a brief explanation of the key pollutants relevant to Local Air Quality Management and the kind of activities they might arise from.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport or energy generation.
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or crude oil.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles under 2.5 micrometres.

Poor air quality can affect people's health on a daily basis and can result in premature death. Therefore, it is imperative that poor air quality is recognised as a public health issue and that continual measures are taken to improve the air quality even if the air quality objectives in the UK are being met.

The two main types of air pollution within the United Kingdom are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$). Therefore, this report will explain the effects of these pollutants on health, the concentration levels within the Borough of Broxtowe and measures that have been, are being and will be taken to improve the air quality within the Borough.

What is Nitrogen Dioxide?

Nitrogen Dioxide is a reddish-brown gas with the chemical formula NO_2. Nitrogen Monoxide is a colourless gas with the chemical formula NO. Collectively NO_2 and NO are known as Oxides of Nitrogen and the chemical formula is NOx.

As mentioned previously NOx is emitted into the atmosphere due to the combustion of fuels such as coal, oil, gas, petrol, diesel and the burning of wood or as natural gas from domestic central heating boilers or power stations.

Some sources of NOx release NOx in the form of NO_2 into the atmosphere, these are known as primary sources of NO_2, which are mainly emitted from vehicle exhausts.

Another source of NO_2 in the atmosphere is due to a chemical reaction in the atmosphere between NO and Ozone (O_3). This is classed as a secondary source of NO_2. However, if concentrations of O_3 are low near to the source of NO then NO_2 will not be formed.

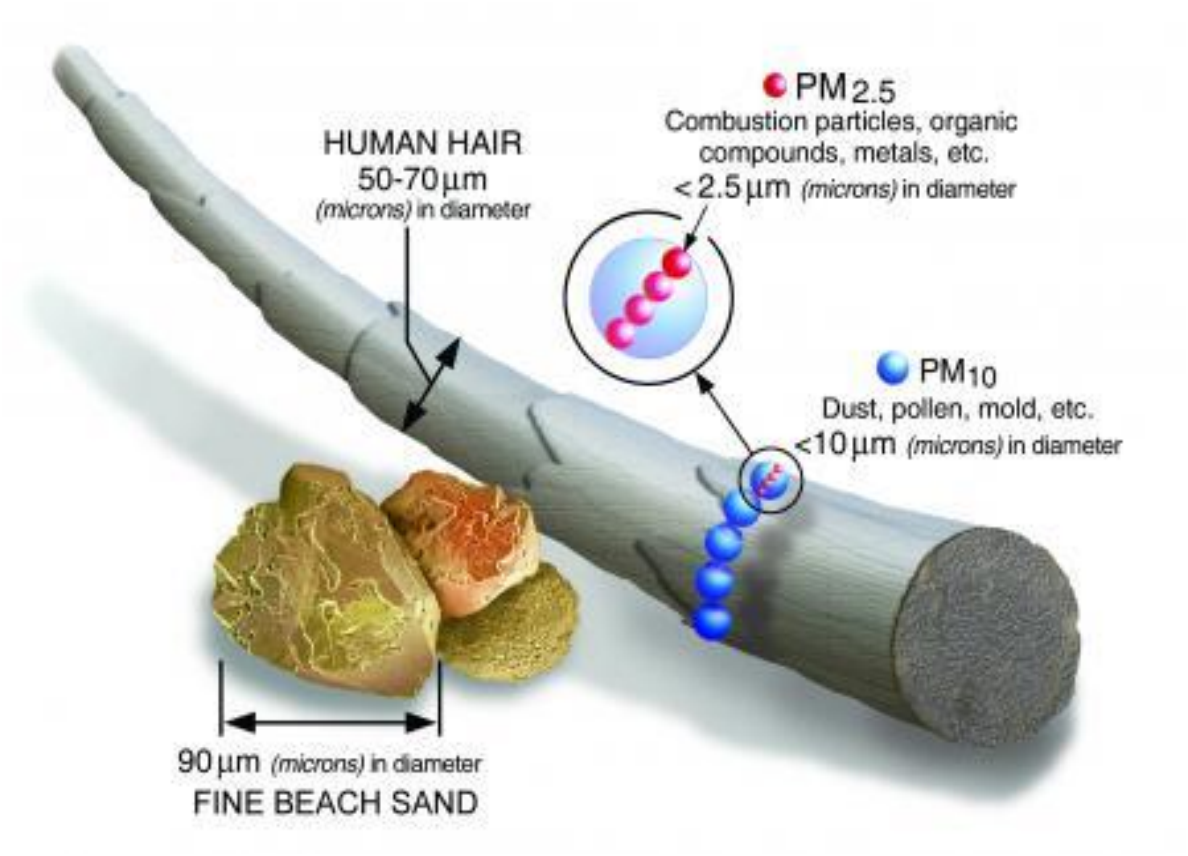
What is Particulate Matter?

Particulate matter is the term used for a mixture of solid particles and/or liquid droplets within the air. Particulate matter varies in size with some particles being easily visible to humans e.g. dust, soot, smoke and vapour from domestic boiler flues. However, some particles are so small that they cannot be seen with the naked eye, and it is these particles that are easily absorbed deep into the lungs and cannot be expelled when they are breathed in.

There are many sources of particulate matter in the United Kingdom, examples of these are: Vehicle exhausts, the wearing of brake pads, tyres and asphalt, Rust from vehicles, poor fuel combustion, dust from demolition and building sites, bonfires and inefficient burning of solid fuel e.g. wood.

Within the United Kingdom the main particulate matter that causes concern is particulates that are classed as ‘fine particles’ ($PM_{2.5}$) or ‘inhalable coarse particles’ (PM_{10}). The particles are measured in size and referred to as microns (µm). PM_{10} are particles that are 10 microns to 2.5 microns in size, and $PM_{2.5}$ are particles that are 2.5 microns or less.

Size of Particulate Matter



Source: United States Environmental Protection Agency (US EPA), 2020 - Size of Particulate Matter

Research has shown that there is significant harm to health at concentrations of Particulate Matter well below the current EU and UK limit values. (See Appendix H for the Air Quality Objectives for the UK).

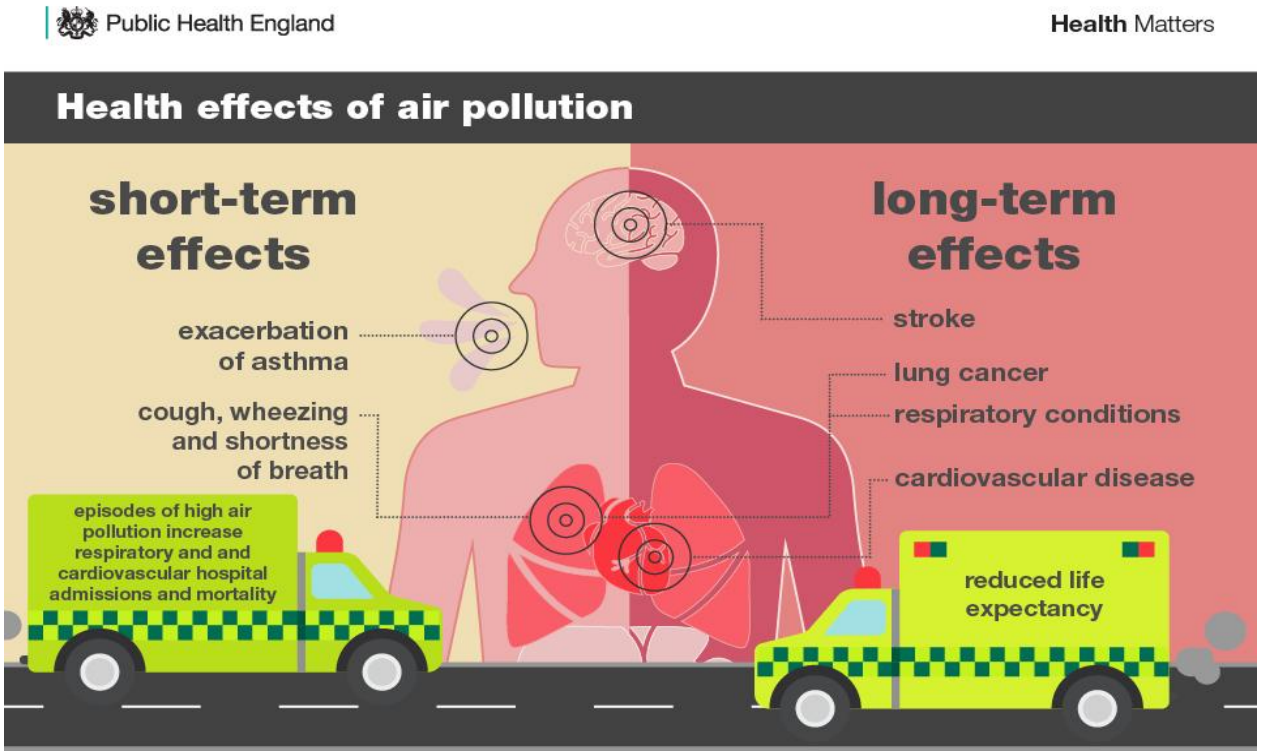
What are the Health Effects of Poor Air Quality?

Air pollution is associated with several adverse health impacts both short term and long term. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions.

When people are within an area of poor air quality the length of time, they are there is called the ‘exposure time’. There are two types of exposure, short-term and long term. Short-term is when the person is subjected to poor air quality for a short time e.g. a couple of hours and the effects are called ‘Short-term effects’. Long term exposure is when

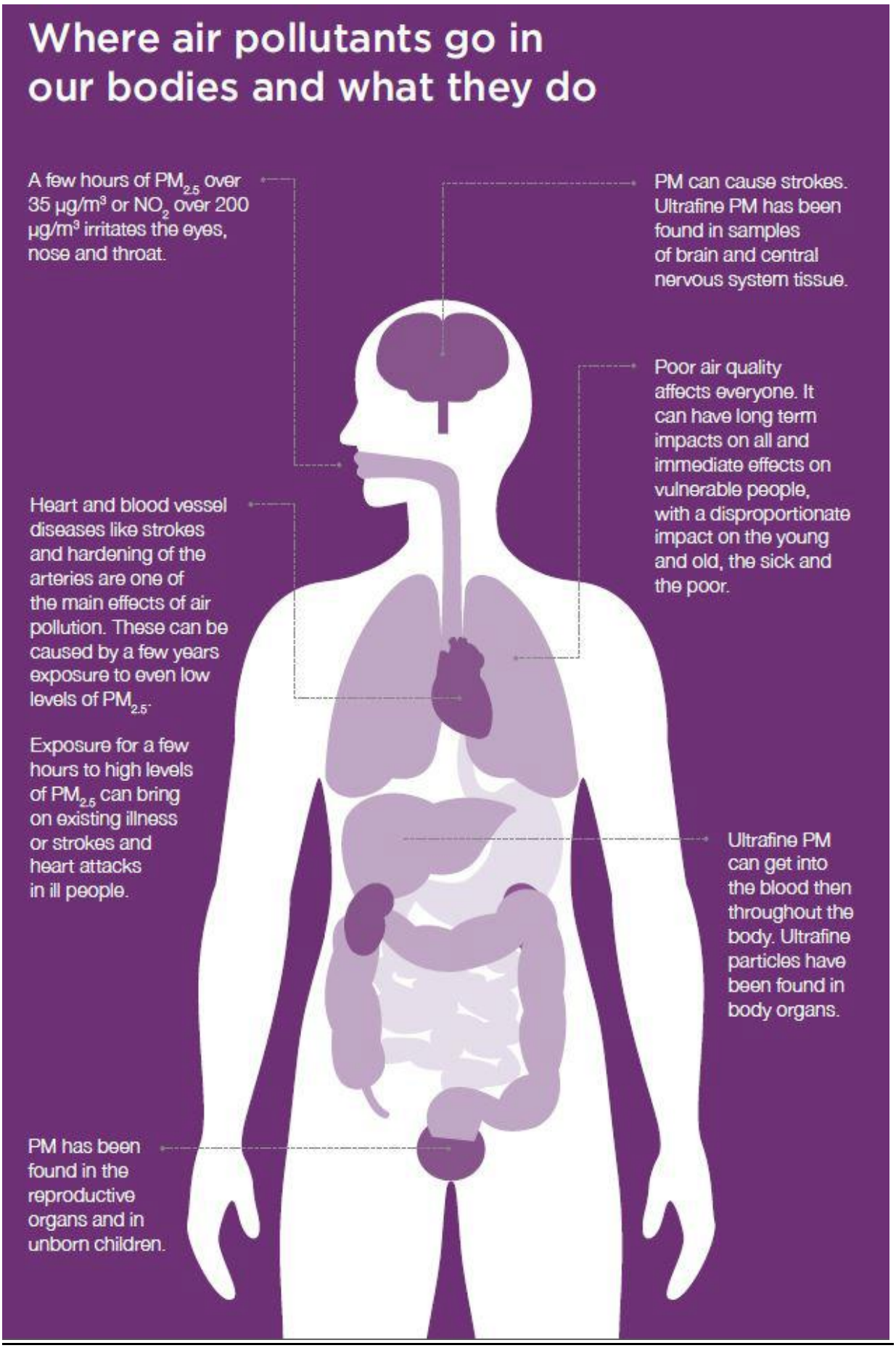
people are consistently living or working with in an area where there is poor air quality. The short- term and long-term effects on the body are shown in the diagram below.

The short and long-term effects of air pollution



Source – Health Matters 2018, Office for Health Improvement & Disparities

To be able to understand the full effects of poor air quality on humans an understanding of how the pollutants enter the body, where they go once, they are within the body and the effects that they have are shown in the diagram overleaf.



Source - Air Quality: A Briefing for Directors of Public Health, March 2017 Air Quality: A Briefing for Directors for Public Health

Health Effects of Nitrogen Dioxide

The main health effect of breathing in raised levels of Nitrogen Dioxide is the increased likelihood of respiratory problems, as Nitrogen Dioxide inflames the lining of the lungs, and it can reduce immunity to lung infections. This can cause problems such as wheezing, coughing, colds, flu and bronchitis and can exasperate pre-existing conditions like asthma and Chronic Obstructive Pulmonary Disease.

Health Effects of Particulate Matter

The health effects associated with short term and long-term exposure to particulate matter are exacerbation of asthma, effects on lung function, increases in hospital admissions for respiratory and cardiovascular conditions, and also increases in mortality[1]. Office for Health Improvement & Disparities has produced estimates of the risk of mortality from particulates for all local authorities in the United Kingdom. The estimates are based on the researched evidence of mortality risk combined with modelled levels of background air pollution to which populations are exposed to at each local authority. See Section 2.3 of this report for further information on the estimated effects of annual mortality in 2024 of human made $PM_{2.5}$ air pollution.

Air Quality in the Borough of Broxtowe

Breathing in polluted air affects our health and costs the NHS and our society billions of pounds each year. Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality.

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Low-income communities are also disproportionately impacted by poor air quality, exacerbating health and social inequalities.

[1]Gowers, A.M. et al Estimating Local Mortality burdens associated with Particulate Air Pollution, Public Health England, 2017.

The main air quality issue within the borough is due to the M1 and the A52. The A52 is the main road that connects Nottingham to Derby and is used heavily by commuters. Residential properties are situated alongside the M1 and the A52.

The main pollutants of concern within the borough are Nitrogen Dioxide and Particulate Matter, which is emitted from vehicles exhausts and is prevalent in areas where there are congested roads e.g. the M1 and the A52. However, it must also be noted that ambient background levels are affected by emissions from domestic heating e.g. Oxides of nitrogen from boilers and particulate matter from solid fuel burners.

Broxtowe Borough Council participates in the United Kingdom Nitrogen Dioxide diffusion tube network and has 38 diffusion tubes sites throughout the borough. The sites are primarily monitoring the M1 corridor and the A52. Monitoring is still being undertaken in the four revoked Air Quality Management Areas (AQMAs), to ensure that the concentrations remain below the air quality objective.

The 2025 nitrogen dioxide results show that the air quality levels are below the objective of 40µg/m^3 for all the monitoring locations throughout the borough. The results and trends are discussed in greater detail in Section 3.2.1 of this report.

In respect of particulates, the modelled background level provided by Defra for the Borough of Broxtowe indicated levels between 6.5µg/m^3 and 7.9µg/m^3 for 2025, with the annual mean for 2025 being 7.1µg/m^3. The World Health Organisation (WHO) guideline level for $PM_{2.5}$ is 10µg/m^3.

Broxtowe Borough Council has a close working relationship with National Highways who manage the M1 Motorway and the A52, which run through the borough and Nottinghamshire County Council's Transport Planning and Programme Development Place Department who manage the remaining roads that run through the borough; this includes the A610/B600 Nuthall Roundabout.

The Council works with National Highways and Nottinghamshire County Council by continuing to monitor air quality levels throughout the borough, to inform them of any changes to the air quality levels and to provide yearly air quality reports. By working together actions are implemented where possible to ease congestion by maintaining a steady flow of traffic throughout the borough and to also promote sustainable travel.

The Environmental Health team at Broxtowe Borough Council also works closely with the Environment Agency who attend the Nottinghamshire Environmental Protection Working Group meetings along with some of the local authority planners. This ensures that air quality issues are raised and considered throughout the planning process.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution. Further information on actions to improve air quality are discussed in greater detail in Table 2.1 of this report.

Conclusions and Priorities

In conclusion the 2025 Nitrogen Dioxide results show that the air quality levels are below the objective of 40µg/m^3 and the background modelled PM_{10} and $PM_{2.5}$ are below the air quality objectives throughout the borough. Although the objectives are being met, it is very important to continue to improve air quality within the UK as poor air quality is a public health concern.

Therefore, to continue to improve the air quality in the borough the priorities for Broxtowe Borough Council in addressing air quality for the coming year are to:

- Review the NO_2 diffusion tubes network annually, discontinue sites where the annual air quality levels are comfortably below the objective, and relocate them to new sites within the borough if needed. Extensive monitoring will allow Broxtowe Borough Council to identify and focus on ‘problem’ areas.
- Continue to reduce the levels of NO_2 in the borough by working with National Highways and Nottinghamshire County Council.

- Continue to promote the final version of the “EMAQN Air Quality and Emissions Mitigation: guidance for developers” document.
- Continue to be a member of the Nottinghamshire Environmental Protection Working Group, and to liaise with colleagues in Public Health and the Health and Wellbeing Boards (Nottingham City and Nottinghamshire County) to ensure that Air Quality continues to be included in the Joint Health and Wellbeing strategy 2022-2026 and any future work. Engage with the public about air quality and raise awareness of the health effects of air quality.
- Continue to provide the public, companies and businesses within the borough with methods that they can use to improve air quality for themselves and the health of their employees.
- Continue to provide information on green travel e.g. walking, cycling by providing leaflets.
- Continue to support bus companies and taxis that operate within the borough to reduce emissions.
- Continue to review suitable research methods for reducing air quality levels for both NO_2 and particulate matter.

One of the challenges associated with addressing the air quality in the borough is that the main source of the air quality problem is the M1 Motorway, which is managed by National Highways and is not under the control of Broxtowe Borough Council. Although Broxtowe Borough Council have a close working relationship with National Highways it is unable to impose or make any changes to the M1 to improve the air quality within the neighbouring residential areas. However, National Highways has undertaken projects at great expense in the past to improve the air quality within the borough e.g. widening scheme and Smart Motorway scheme.

Apart from the M1 and the A52 all the roads within the borough are managed by Nottinghamshire County Council who manage the traffic flows, repairs, diversions etc. There are several challenges associated with this. The first challenge is that Broxtowe Borough Council is unable to impose or make any changes to the structure or flow of the roads. The second challenge is the limited funding currently available to County Councils

for significant integrated transport improvements (£3.9m per year for all safety, capacity, active travel, parking, bus and traffic management infrastructure improvements). This limits the funding available for transport schemes that will deliver air quality improvements.

Local Engagement

Broxtowe Borough Council was selected in 2018 to be in the Air Quality Task and Finish Group, which was set up to update the Nottinghamshire Air Quality Strategy (NAQS). The draft NAQS was approved at the Nottinghamshire County and City Health & Wellbeing Boards in 2019 and the finished format of the NAQS has been endorsed by the portfolio holders and is now published online. Improving Air Quality is now a priority of the Nottinghamshire Joint Health and Wellbeing Strategy 2022-2026 as part of the Ambition to develop Healthy and Sustainable Places.

Air Quality also forms part of the Spatial planning & Health Framework and Health Impact Checklist produced and used for Local Development Plans.

How to get Involved

Residents and businesses living or working in Nottinghamshire can improve the air quality in the area by taking simple measures. One of the main changes that can be made is to use sustainable travel more and reduce dependency on the car when possible. Below are some of the actions that people can take, and particularly for short journeys.

- Travel Choice – Nottinghamshire County Council's Travel Choice webpages provide information and advice on the different ways to travel around Nottinghamshire, whether that's walking, cycling, public transport or car sharing. Residents, jobseekers, businesses and employees can find travel information and advice for the county (including bus and cycle maps, leisure 'Routes and Rides' and a journey planner) at Travel Choice
- School Travel Toolkit – Aimed at school leaders, teachers, parents/carers, children, and those living near to our schools, the Nottinghamshire School Travel Planning Toolkit provides information and advice on improving travel to and from Nottinghamshire's schools, including the sustainable and active travel modes available. The toolkit can be found at School Travel Toolkit

- Public transport – To use all means of public transport whenever possible e.g. trams, buses and trains. In addition to printed materials, an integrated public transport planning tool detailing local bus, rail and tram networks, as well as for trips further afield can be found at Travel Choice Journey Planner and Traveline Details on travelling on school buses to Nottinghamshire schools and assistance available to do so, can be found at Travel to Schools. The tram timetable is available at Tram Timetable.
- Car share – The Nottinghamshire car share scheme, *'nottinghamshare'*, is available to anyone Car Share Scheme but all businesses can produce their own.
- Park and Ride – There are a variety of Park and Ride sites within Nottinghamshire, which serve the Nottingham Tram and buses. Information for these Park and Ride sites which includes maps of their locations are found at Park and Ride
- Walking and Cycling – The health benefits of physical activity e.g. walking or cycling outweigh the risks from air pollution. You can easily avoid the worst pollution by travelling along quieter streets. Even walking on the side of the pavement furthest from the road can help.

  Walking.

  - Walk short distances rather than drive; this also has the benefit of improving your health as well.
  - Information on walking networks in Nottinghamshire can be found at Walking Networks and Rights of way when walking in Nottinghamshire and a planning tool for deciding your route when walking can be found on the Travel Choice website
  - Walking and cycling to school – School travel plans promote group cycling and walking for pupils to safely get to school. Information on the travel to school options can be found at Travel to Schools Options.

  Cycling.

  - Use the extensive cycle routes that are available throughout Nottinghamshire. Maps and cycling journey planners that cover Nottinghamshire, including Broxtowe are available on the Travel Choice website and at Cycling Rights of Way in Nottinghamshire. Maps of just the city cycle routes for Nottingham are available at Cycle Maps for Nottingham

Sustrans is a charity that promotes sustainable travel and further information can be found at Sustrans
RideWise, a local cycling charity, also provide advice, training, bike rides, free bike loans and information about routes and journey planning. Further information about RideWise can be found at RideWise

- Driving- When you have to drive you can still help to improve air quality by;
    - Make sure that your car is at its most efficient and think about how you drive, this will also save you money. Tips on how to save money on fuel and reduce your emissions are available at Driving Advice from Energy Saving Trust.
    - If you are thinking about changing your car consider buying a low-emission vehicle, you can get more information on these vehicles and the support available at Electric vehicle charging in and around Nottinghamshire
- Bonfires – To not have bonfires at all and to compost all garden waste and recycle rubbish rather than burn it.
- Heating your home –
    - Smoke Control Area – Large parts of Nottinghamshire are smoke control areas; therefore, you cannot emit smoke from a chimney unless you are burning an authorised fuel or using an exempt appliance e.g. some burners or stoves. Further information on suitable fuels and exempt appliances can be found at Smoke Control Information from Defra All appliances must be kept in good working order to ensure that they are working efficiently and it is advised that you contact your Local Council to determine whether you are in a smoke control area or not.
    - House Boilers – Ensure that boilers are serviced regularly and kept in good working order. If a boiler needs replacing, then purchase one that has a low NOx emission rating

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1 Local Air Quality Management

This report provides an overview of air quality in Broxtowe Borough Council during 2025. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Broxtowe Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

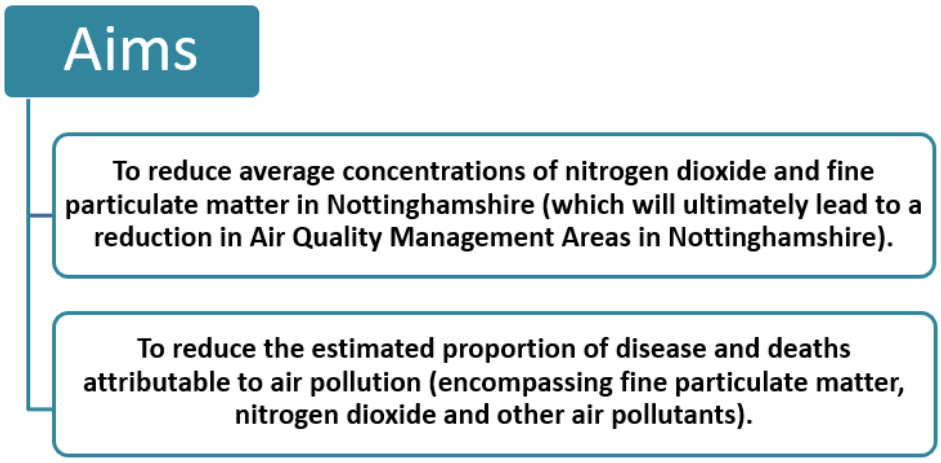
Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained and provide dates by which measures will be carried out.

Broxtowe Borough Council currently does not have any declared AQMAs. A joint Nottinghamshire Air Quality Strategy is in place to prevent and reduce polluting activities.

Local Air Quality Strategy

Although Broxtowe Borough Council does not have an air quality strategy solely for this borough, this ASR is written in alignment with the aims and objectives of the Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030. Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030.

This Joint Air Quality Strategy has been developed collaboratively across Nottinghamshire authorities (taking into account the DEFRA Air Quality Strategy factsheet in relation to joint Air Quality Strategies, which is available from the DEFRA Air Quality Hub, https://www.airqualityhub.co.uk/) and sets out the steps the local authorities will take to improve local air quality. This joint approach ensures that local authorities including Broxtowe Borough Council are collectively addressing air quality concerns while still considering local-level priorities. Its aims are to encourage prevention and reduction of polluting activities across a range of diverse sectors.



The Strategy establishes the regional steps authorities will take to improve air quality while maintaining flexibility for local implementation. It is reviewed regularly by the Nottingham and Nottinghamshire Air Quality Oversight Group (NNAQOG) to remain up to date and to provide progress updates to the County and City Health and Well-Being Boards.

The NNAQOG includes colleagues from City and County Local Authorities and consists of Public Health, Environmental Health, Transport Planning and the local NHS; with input also from National Highways, Environment Agency, UKHSA, among others. Additionally, engagement with the mayor's office for the East Midlands Combined County Authority (EMCCA) will be sought at the earliest opportunity.

Other Local Strategies

The Nottinghamshire Joint Health and Wellbeing Strategy 2022 – 2026 has four ambitions one of which is to Create Healthy and Sustainable Places:

- We'll ensure that the environment we grow, live, work and age in promotes good health and wellbeing.
- We'll use the planning and transport system, along with economic planning, licensing and policy decisions, to create places that do this.

This will also help to reduce health inequalities and also benefit the environment, for a better quality of life. There are nine areas of focus and one of them is Air quality, which states that:

"Clean air is essential for good health and for the environment and climate. We will work to make positive changes which can also have positive Air Quality - Ensure that outdoor air quality supports healthier lives in all communities' effects in terms of travel to school and work, being active and safety."

The Nottingham and Nottinghamshire ICS Green Plan 2022 to 2025 recognises the importance of the NHS taking action to reduce air pollution and work with partners to improve air quality. The Plan includes the following ambitions:

- Promoting sustainable transport and reducing overall transport
- Increasing the use of ULEV and ZEV vehicles
- Developing the infrastructure to support lower carbon transport options

- Enhancing understanding and communication via Green Travel Plans

The Nottingham and Nottinghamshire ICS Health Inequalities Strategy 2020-2024 has a strategic objective for system partners to work together to support action to improve air quality.

Air Quality and Climate Change

Many sources of air pollution are also sources of greenhouse gas emissions e.g. combustion creates CO_2, NOx and PM. Emissions from road transport, energy and heat generation and domestic solid fuel burning are some of the most common sources that contribute to both climate change and air pollution.

Broxtowe Borough Councils Climate Change and Green Futures Strategy 2023-2027 has ten strategic themes to identify, manage and mitigate the worst impacts of Climate Change.

Climate Strategy	**Transport and Travel**
Energy and Water	**Built Environment**
Core Strategy and Planning	**Recycling and Resources**
Natural Environment	**Communities**
Business and Supply Chain	**Communications**

Air Quality Monitoring is included in the Natural Environment theme and as climate change mitigation measures reduce emissions of greenhouse gases it will also help reduce air pollutants and lead to improvements in health outcomes as evidenced in Health Effects of Climate Change (HECC) in the UK: 2023 report.

.

2.2 Progress and Impact of Measures to address Air Quality in Broxtowe Borough Council

Defra's appraisal of last year's ASR concluded that.

- The BBC justification to use the national bias factor instead of the local bias factor shows a high level of technical understanding, and the reference to Section 7.221 TG22 further amplifies this understanding. BBC is encouraged to continue with this level of consideration and scrutiny in determining the application of bias – **BBC will continue to do this.**
- The executive summary provides additional information about NO_2 and particulate matter, as well as the health impacts of both. This is a welcome addition and should be continued in future ASRs – **BBC will continue to do this.**
- The report is descriptive and informative throughout with each section providing a significant amount of detail, this is appreciated and encouraged to continue in future ASRs. Overall, this report can be considered an example of good practice due to provision of the required information and significant further detail provided throughout **– BBC will continue to do this.**
- The colour coded system describing why there were missing results in the monthly results table, is a creative and clever way of providing an extra detail about the monitoring results. This is a welcome addition and should be continued in future ASRs **– BBC will continue to do this.**
- In chapter 3.1.2 it is recommended to confirm whether the monitoring network has changed compared to the previous year. If the monitoring network has not changed, it is recommended to confirm this with one sentence in future ASRs. **– BBC will do this.**
- It is recommended to distinguish between number of diffusion tubes and number of monitoring locations. This is mostly done, however, it some paragraphs it is reported that the Council have 41 monitoring sites, however, it is 41 diffusion tubes and 38 monitoring sites. The Council should consider this in future ASRs. **– BBC will do this.**

Broxtowe Borough Council, working in partnership with Nottinghamshire County Council (NCC) and the East Midlands Combined County Authority (EMCCA), has taken forward a number of direct measures during the current reporting year of 2025 in pursuit of

improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. 79 measures are included in Table 2.1, with the type of measure, and the progress BBC/NCC/EMCCA have made during the reporting year of 2025 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Table 2.1 is colour coded with the Three Key measures for Broxtowe Borough Council in yellow, the measures that were completed in 2025 are in blue and the measures that were completed between 2017 – 2024 are in green.

More detail on these measures can be found in their respective Action Plans The Air Quality Strategy for Nottingham and Nottinghamshire 2020-2030, BBC Local Plan 2018 – 2028, BBC Climate Change and Green Futures Strategy 2023-2027, The Nottinghamshire Local Transport Plan 2011-2026 (and its Implementation Plans), D2N2 Local Cycling and Walking Infrastructure Plan (LCWIP), NCC Electric vehicle charging frameworks and strategies and National Highways Reports (post opening project evaluation reports for the M1 Junction 25 to 28 widening and the A52 West of Nottingham Corridor Improvements).

Key completed and on-going measures are:

- The new single Smoke Control Order came into force in June 2025.
- The Nottingham and Nottinghamshire Air Quality Strategy 2020-2030
- The replacement cremators, associated plant and abatement system at Bramcote Crematorium were completed in the summer 2025.
- Nottinghamshire on-street EV charging pilot scheme - electric vehicle cable channels (EVCC) – NCC successfully secured (and received in January 2023) £774k from the Government's Local Electric Vehicle Infrastructure (LEVI) Pilot Funding enabling the delivery of up to 300 EV cable channels. Delivery started in February 2023, with a total of 81 cable channels installed in the county up to the end of the 2024/25 financial year.
- To continue to replace Broxtowe Borough Council older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers.

- ❖ To investigate and consider suitable alternative replacements for the remaining electrically heated Council properties - High heat retention units were being fitted as replacements in 2022, and this will be continuing in future years. Air source heat pumps will also be considered at suitable properties where a retro fit solution is possible.
- ❖ Broxtowe Borough Council Cycle to Work Scheme – six employees purchased bikes through this scheme in 2025. Since the scheme started, 200 employees have purchased bikes through the scheme.
- ❖ Encouraging the use of Hybrid or Electric vehicles for BBC employees Eleven employees used a personal Electric vehicle and five used a ULEV in 2025.

Broxtowe Borough Council expects the following measures to be completed over the course of the next reporting year:

- ★ To reschedule the dry recycling waste rounds to reduce fuel consumption and improve efficiency The round reschedule is currently in progress. Completion is anticipated in April 2026.
- ★ Lane Rental Scheme - The intention of the scheme is to minimise works from taking place during the peak times, The anticipated start date for a Lane Rental scheme in the county, if approved, is April 2026.
- ★ Improving the cycle network in Stapleford -Footpath and crossing improvements as well as path widening and access gates to recreational grounds are all due to be completed in the summer of 2026.
- ★ Cycling networks as part of Active Travel Funding (ATF) Tranche 4 - 1.1m from Tranche 4 of the Active Travel Fund (ATF), for the development of a new walking and cycling facility along Baulk Lane, Stapleford. The scheme is due to be completed in March 2026.

Broxtowe Borough Council's priorities for the coming year are predominantly through measures to make the best use of the transport networks and through smarter travel measures that will encourage people to travel more sustainably.

Measures will include:

- On-going effective land use planning and securing of appropriate levels of developer contributions for mitigation (including travel planning) and sustainable transport improvements.
- Traffic control and information provision to minimise disruption and delay on County Council managed roads (including the A610) such as contingency planning, the effective co-ordination of works and the provision of real-time travel information.
- Measures to reduce the need to travel at peak times such as the provision and encouragement of flexible working arrangements.
- The facilitation of smarter travel behaviour such as the provision of a car sharing scheme and integrated and concessionary ticketing schemes.
- The encouragement of smarter travel behaviour such as the marketing and promotion of passenger transport, walking and cycling, provision of cycling and walking route maps, cycle training programmes, and web-based journey planners.
- The encouragement of the uptake of low-emission vehicles, including the continued identification and implementation of the Nottinghamshire public electric vehicle charging network as well as grants for businesses to install on-site charging infrastructure.
- Enhancements to the local cycling and walking networks.
- Travel planning such as the development of new travel plans at businesses across the county through planning conditions.

Broxtowe Borough Council worked to implement these measures in partnership with the following stakeholders during 2025:

- All Nottinghamshire Local Authorities including Nottinghamshire County Council – Environmental Health, Public Health and Transport Plans & Programme Development Team.

The principal challenges and barriers to implementation that Broxtowe Borough Council and Nottinghamshire County Council anticipates facing are:

- Availability of funding for the above measures to continue their delivery
- Ensuring sufficient mitigation is secured through the development control process to address the potential impacts on the highway network of not only individual developments but also the cumulative impacts of development.

Progress on the following measures has been slower than expected due to:

- Cycling network and infrastructure - The D2N2 LCWIP will be used to help identify potential future cycle improvement schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals. A potential barrier to such projects is the availability of funding, feasibility and public acceptable of proposals.
- Consideration of car club into the county - Dependent on the determination of business case and commercial operator coming forward. Barriers include financial risk, organisational culture (i.e. using personal cars less) and specific service needs.
- Traffic control and management, contingency planning, and effective event and incident management – A potential barrier to this work is a lack of future revenue funding. The UTCC is a shared facility between NCC and NCiC. Estimated cost shown is NCC's annual contribution. Cost dependent on the number of incidents.

Whilst the measures stated above and in Table 2.1 will help to contribute towards improving the air quality, Broxtowe Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to improve the air quality in the borough.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	**Install energy efficiency measures to Council housing properties to improve ECP ratings to C.**	Other	Other	2024	2028	BBC Capital Works - Capital Works Manager	Partially funded by the Council (housing revenue account and borrowing) and part funded through grant funding from DESNZ.	Funded	£1m-£10m	Implementation	Reduced Emissions	Reduced carbon emissions due to lower heating demand of properties	• Wave 3 energy efficiency measures to be on site in September 2025 until 2028. • 90 properties in total have been completed by the end of 2025. On completion of the project in 2028, it is planned over 400 properties will have received improvements.	An update on this new measure will be in the 2027 ASR.
2	**Implementation of the Electric Vehicle Infrastructure (EVI) Strategy**	Policy Guidance and Developmental Control	Low Emission Strategy	2025	2027	BBC -Climate Change Manager	LA-BBC and NCC	Funded	-	Implementation	Reduction in NO2 and PM due to increased use of Electric Vehicles	% Usage of EVCP	• BBC and NCC Feasibility of electric vehicle charging points underway in the borough where deemed appropriate. • BBC owned public car parks EV charging points have been identified to be upgraded and this will be undertaken in 2026-2027 • NCC out to tender for LEVI (local Electric Vehicle Infrastructure for EVCP	EVI Strategy publicly available at Electric Vehicle Charging Infrastructure Strategy EVI Strategy undergoing a review and refresh during 2026/27
3	**Wood Burner, Smoke Control Area and Bonfire Enforcement and Education**	Promoting Low Emission Plant	Other Policy	2025	2026/27	City/Countywide project	Section 31 Grant funding	Funded	Approx. £50k	Implementation	Reduced emissions of N02 and PM	Communication n strategy and toolkit of resources	All Notts LAs have agreed to pool some Section 31 Grant funding together to commission a Communication Strategy and tool kit of resources on Domestic Burning	
4	**Light rail tram infra-structure**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2015	On-going	NCiC and NCC	DfT/WPL funding	Funded	>£10 Million	Completed	Reduction in NO_2 and PM	Increased passenger transport patronage	• The light rail/tram system, Nottingham Express Transit (NET), provides services between the city centre and local centres, such as Hucknall and Beeston. There are two park and ride sites located within the county, at Hucknall and Toton Lane, which serve the NET network, allowing commuters and visitors a safe place to park their vehicle and catch the tram into the to the city centre.	The reduction in passenger numbers is believed to be due to changing

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													NET Phase 2 (with route through Broxtowe) opened 2015. In 2024-25, there were 15.7 million passenger journeys on the tram network, which showed a growth of 1.3% in comparison to the previous year.	travel patterns post pandemic and people working from home more.
5	**Promoting travel choices - Consideration of car club into the county**	Alternatives to private vehicle use	Car Clubs	TBD	Ongoing	NCC/NCiC	NCC	TBD	-	Ongoing	Reduction in NO_2 and PM	Restrain average journey times in the morning peak to a 1% increase per year A reduction in staff business emissions and cost, through both a car club and a wider review of staff travel habits.	• NCiC scheme introduced in 2014, with the provider reviewed in 2018. Expansion of scheme into county dependent on its success, which is still unclear. • Work has been undertaken to look at the feasibility of a partnership with a Car Club operator in the county, for both residents and internal use (i.e. staff travel). The work will feed into a wider fleet review and review of staff business travel, with a few more aspects to be expanded upon. • Funding for implementation to be determined.	Dependent on the determination of business case and commercial operator coming forward. Barriers include financial risk, organisational culture (i.e. using personal cars less) and specific service needs.
6	**Nottinghamshire on-street EV charging pilot scheme - electric vehicle cable channels (EVCC)**	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2022	Ongoing	NCC / Via EM Ltd	Privately funded by resident and OZEV LEVI Pilot Funding	Privately funded by resident and OZEV LEVI Pilot Funding	Costs to be determined	Implementation	Reduction in pollutants and emissions due to increased use of low emission vehicles.	Number of EVCC installed and back-office data from EV charge point	• NCC approved the trialling of on-street EV charging cable channels at Transport & Environment Committee in February 2022. • NCC successfully secured (and received in January 2023) £774k from the Government's Local Electric Vehicle Infrastructure (LEVI) Pilot Funding enabling the delivery of up to 300 EV cable channels. •Delivery started in February 2023, with a total of 135 cable channels installed in the county up to the end of the 2025/26 financial year. with a total of 81 cable channels installed in the county up to the	NCC's EV cable channel pilot programme is currently in progress. The pilot is privately funded by resident (EV chargepoint) and OZEV LEVI Pilot Funding

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													end of the 2024/25 financial year.	
7	**Nottinghamshire EV charging infrastructure (potentially on and off street)**	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2023/2024	2025/26	NCC / Borough and District Councils	OZEV funding (LEVI)	Funded	£1 million to £10 million	Implementation	Reduction in pollutants and emissions due to increased use of low emission vehicles.	Number of EV charging installed and back-office data from EV charge point	•NCC have developed an Electric Vehicle Charepoint Framework document which outlines NCC's ambition to expand the EV charging network across the County. • NCC have secured £5.22m of capital funding from the DfT to roll-out the on-street LEVI project, which will see the installation of 1000+ public chargepoints targeted at areas without on-street parking. • The tender documentation for the LEVI project is currently in development and is expected to be published in May 2026.	Measure is reliant on a successful LEVI bid and the appointment of viable Chargepoint Operators. £5.522m of external LEVI capital funding has been secured for EV infrastructure programme development.
8	**To develop an implementation plan for the Nottingham and Nottinghamshire Air Quality Strategy 2020-2030**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2024	2030	NCC/NCiC/ Borough and District councils	N/A	Not Funded	N/A	On-going	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	To develop an implementation plan for the Nottingham and Nottinghamshire Air Quality Strategy 2020-2030 to ensure it is implemented locally by the Nottingham and Nottinghamshire Air Quality Oversight Group (NNAQOG), Broxtowe Borough Council is a member of the NNAQOG.	
9	**To continue to promote the Nottingham and Nottinghamshire Air Quality Strategy 2020-2030**	Public Information	Via the Internet	2020	On-going	BBC Public Protection – Environmental Health Officer	N/A	Not Funded	N/A	On-going	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•The NAQS was endorsed by portfolio holders in 2020, and it is promoted on BBCs website.	On-going
10	**To investigate providing Supplementary Planning Guidance or a Supplementary Planning Document relating to 'Air Quality and Emissions Mitigation Guidance for Developers'**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	To be decided	BBC Planning Policy Department – Planning Policy Team Leader	LA-BBC	Not Funded	N/A	Planning	Reduced Emissions of N02 and PM	Reduced emissions	The Government's changes to the planning system in 2026 mean that it is no longer possible to produce Supplementary Planning Documents. The Greater Nottingham Strategic Plan (GNSP) is currently at examination. Reflecting the need to reduce emissions and improve air quality, part 1e of proposed GNSP policy 10 states that all new development should be	The new Broxtowe Local Plan, and any associated Planning Guidance, will be the subject of collaboration between the Planning Policy and

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													designed to reflect the need to reduce the dominance of motor vehicles and support active travel. Work will start in 2026 on the production of a new Broxtowe Local Plan. This will provide the opportunity to review policy 20 (air quality) in the current Part 2 Local Plan. There may also be the opportunity to produce informal Planning Guidance on issues relating to air quality.	Environmental Health teams. A new National Planning Policy Framework is expected in 2026. If this is similar to the 2025 draft, it may restrict the ability of the Council to make expectations of developers which exceed national planning policy and/or Building Regulations.
11	**Inspection of Permitted Processes**	Environmental Permits	Other Measures through permit systems and economic instruments	2012	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	Not Funded	N/A	On-going	Reduced Emissions	Reduction in airborne pollutants from the various processes throughout the Borough.	All scheduled inspections completed on time.	On-going
12	**To ensure that all Permitted Processes (where feasible) continue to be rated as 'low environmental risk'**	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	Not Funded	N/A	On-going	Reduced Emissions	Reduction in airborne pollutants from the various processes throughout the Borough.	The risk rating did not change in 2025, and all permitted processes were fully compliant.	On-going
13	**To Inspect Crushers that are used within the Borough on demolition sites when notifications are received to ensure compliance with the process permit and ensure good housekeeping is being maintained**	Environmental Permits	Other measure through permit systems and economic instruments	On-going	On-going	BBC Public Protection – Environmental Health Technical Officer	N/A	Not Funded	N/A	On-going	Reduction in airborne particulates from the crushers used throughout the Borough.	Reduction in airborne particulates from the crushers used throughout the Borough	Reduction in airborne particulates from the crushers used throughout the Borough	On-going
14	**To ensure that all Dust Management Plans are reviewed and approved during the planning application stage**	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	On-going	On-going	BBC Public Protection – Environmental Health Officers	N/A	Not Funded	N/A	On-going	Reduction in airborne particulates from new developments throughout the Borough.	% of dust management plans that are reviewed and approved during the planning stage	All dust management plans were reviewed and approved during the planning stage in 2025.	On-going

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15	**Co-ordination of street works**	Traffic Management	UTC, Congestion management, traffic reduction	On-going	On-going	NCC/Via EM/NCiC	NCC and NCiC revenue funding	Funded	Funded within existing resources	On-going	Reduced emissions by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	• NCC introduced a street works permit scheme on 1 April 2020 to help plan/coordinate roadworks on its managed highway network. Street works management is undertaken by Via EM on behalf of NCC. The fundamental aim of the coordination/inspection regime is to facilitate necessary works, whilst minimising disruption by reducing duration etc. • Regular coordination meetings held between all works promoters and regional partners in additional to regular meetings between NH and regional partners to create a framework programme of planned works affecting strategic and local routes. • Detailed journey time monitoring undertaken annually since 2005/06.	Costs are dependent on number street works undertaken
16	**Traffic control and management contingency planning, and effective event and incident management**	Traffic Management	UTC, congestion management, traffic reduction	Ongoing	Ongoing	NCiC / NCC / Via EM / National Highways (NH)	NCiC / NCC / NH revenue funding	Funded	£100k - £500k	Implemented and ongoing	Reduced emissions of N02 and PM by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	•The local operating agreement between NCC and NH has been comprehensively reviewed to identify the relevant parts of the network which have interaction on each authority and to put in place appropriate communication channels for management of incidents and dissemination of information. • Key locations on the local network have been identified and associated diversion routes investigated in line with the developing network hierarchy. • Incidents dealt with through agreed procedures and regular partnership meetings held. Working in close collaboration with the NCiC and NH, tactical diversion routes have	A potential barrier to this work is a lack of future revenue funding. The UTCC is a shared facility between NCC and NCiC. Estimated cost shown is NCC's annual contribution. Cost dependent on the number of incidents.

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													been developed for the emergency diversion of traffic from any part of the strategic road network, to reduce the delay in rerouting traffic to ease congestion at the time of incidents. • Detailed journey time monitoring undertaken annually since 2005/06. • A traffic control centre monitors traffic movement on the local highway network (not the trunk road/motorways) and provides real time traffic control over many traffic signal installations.	
17	**Traffic Management and Enforcement**	Traffic Management	UTC, Congestion management, traffic reduction	2019	On-going	NCC	NCC	Funded	Not known	On-going	Reduced emissions by reducing congestion on the roads.	Number of visits to the locations and number of observations during the visits.	• NCC has traffic management control patrols on arterial routes across the county to identify hot spots where parking affects traffic flow and remove/dissuade people from parking in a way which affects traffic flowat peak period travel times. • Bus lane cameras are used in the county, as well as CCTV cars that mostly patrol around schools to enforce the 'Keep Clears', which help in improving air quality around the school gates.	On-street parking patrol activities now comes directly under Nottinghamshire County Council
18	**Moving Traffic Enforcement**	Traffic Management	UTC, Congestion management, traffic reduction	2023		NCC	NCC	Funded		Planning	Reduced emissions of N02 and PM by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	•Since June 2022, local authorities have been able to apply to the DfT for the powers to enforce moving traffic offences. Such offences include banned turns, driving in pedestrian areas, environmental weight limits, box junctions etc. • NCC was granted powers to enforce moving traffic offences in December 2024 and the first pilot sites will be the box junction at Lady Bay Bridge, West Bridgford, and the banned right turn into the ASDA off B6166, Newark.	

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19	**Optimisation of traffic signals**	Traffic Management	UTC, Congestion management, traffic reduction		On-going	NCC / Via EM	NCC	Funded	£1m - £10m	Implemented	Reduced vehicle emissions	Restrain average journey times in the morning peak to a 1% increase per year	SCOOT and MOVA equipped signals are relayed back to the Traffic Control Centre so that they can be altered in real time as required.	Implementation ongoing
20	**Lane Rental Scheme**	Traffic Management	UTC, congestion management, traffic reduction	2023	2025	NCC	NCC	Not funded		Planning	Reduced emissions of N02 and PM by reducing congestion on the roads	Restrain average journey times in the morning peak to a 1% increase per year	•NCC are looking at potentially introducing a Lane Rental scheme within the county. • This would involve determining the topmost congested roads in the county and then, following consultation, making an Order which will allow NCC (as the Highway Authority) to apply a levy/charge to anyone undertaking either street works (utilities) or roadworks (Council) during the peak times on these roads. • The intention of the scheme is to minimise works from taking place during the peak times, which would lead to excessive congestion (which impacts on air quality). Any income raised through the scheme can be reinvested in projects to reduce congestion/improve highways, and subsequently air quality. • The anticipated start date for a Lane Rental scheme in the county, if approved, is April 2026.	2026
21	**Promoting on the Council Webpage the Council's Electric Vehicle Charging Points Network within the Borough**	Public Information	Via the Internet	2020	On-going	BBC Parking Services – Parking Manager	LA - BBC	Not Funded	Within existing resources	On-going	Reduction in $N0_2$ and PM due to raising awareness of where people can use the charge points for their electric vehicles	28 EVCP are currently promoted on BBC's website.	•The Council currently has 28 electric vehicle charging points in Beeston, Stapleford, Kimberley and Eastwood these are displayed with the postcodes for easy identification on the Council website and this is updated when necessary. The council are currently reviewing usage, age, and charge capacity of existing charging points. Results from this review	On-going

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													will inform several sites to be upgraded to more efficient and powerful capacities, and additional charging points will be installed at alternative sites.	
22	**To continue investigating the installation of Electric Vehicle Charging Points for staff and visitors to the Council to use**	Promoting Low Emission Transport	Other	2020	On-going	BBC Parking Services – Parking Manager	Provider Funded	-	-	On-going	Reduction in $N0_2$ and PM by encouraging Electric Vehicle use	Number of EVCP installed for visitors to the Council to use.	• Investigation into this has been undertaken and the infrastructure and power supply has already been installed within Devonshire Avenue car park. • Provider funded opportunities are available and currently two EV providers are being reviewed via procurement framework	**Infrastructure and power supply complete** On-going
23	**Review of off-street car parking charging**	Traffic Management	Emission based parking or permit charges	2020	2023	BBC Parking Services – Parking Manager	LA - BBC	Funded	<10K	Completed	Reduction in $N0_2$ and PM	Reduced Emissions	• On-going annually. The policy document is updated only when there is significant legislation or council policy changes •Charges will also be reviewed on an ad hoc basis. • There are no plans to introduce emissions-based charging in car parks. Since January 2024, additional charges have been introduced around the borough, to those car parks that were previously free.	On-going
24	**To review and update the Electric Vehicle Infrastructure (EVI) Strategy for the Borough of Broxtowe**	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV charging, gas fuel charging	2026	On-going	BBC Climate Change Manager	LA-BBC	Not Funded	Within existing resources	Planning	Reduced Emissions	Improving Air Quality, reduced Emissions by promoting EV charging locations	• The Electric Vehicle Infrastructure (EVI) Strategy for the Borough of Broxtowe is under review and update to be completed in 2026/27. Local Government Reorganisation (LGR) will determine when the next update takes place.	2026/27
25	**To review the Climate Change and Green Futures Strategy 2023-2027**	Policy Guidance and Development Control	Low Emissions Strategy	2022	2027	BBC Climate Change Manager	LA-BBC	Not Funded	Within existing resources	Implementation	Reduced Emissions	Improving Air Quality	• The Climate Change and Green Futures Strategy for the Borough of Broxtowe will be refreshed in 2026/27.	2026/27

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26	**To review the Carbon Management Action plan annually**	Policy Guidance and Development Control	Low Emissions Strategy	2024	On-going	BBC Climate Change Manager	LA-BBC	Not Funded	Within existing resources	Implemented and on-going	Reduced Emissions	Improving Air Quality	• Carbon Management Action plan is reviewed and updated annually. 2025/26 carbon footprint calculations underway pending utility data which is due w/c 14 May. 2024/25 carbon emissions reduced by 26% compared to 2023/24 predominantly due to transitions from diesel to HVO in fleet vehicles (where possible) resulted in an 87% reduction in emissions on previous year for fleet and machinery.	
27	**Real time travel information**	Public Information	Other	-	Ongoing	NCC/Via EM Ltd	NCC revenue funding	Funded	-	Implemented and on-going	Reduced Emissions	Restrain average journey times in the morning peak to a 1% increase per year	• Information conveyed by all forms of media (press, radio, website, social media etc.). • The Travelwise centre remains in operation 24hrs a day, every day.	Nottingham Travelwise website: Nottingham Travelwise
28	**Bus service improvements**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2022	Ongoing	EMCCA NCC / NCiC / PT operators	EMCCA	Funded	>£10 million	Implementation	Reduced emissions of N02 and PM due to increased passenger transport patronage.	Increased bus patronage	• The new East Midlands Combined County Authority has £65.5m to invest in bus service operations and £148m in capital infrastructure improvement over the next three years focus on maintaining current service levels and delivery of major bus priority schemes. June 2026 Exec board will see a raft of schemes signed off for delivery including an upgrade to Sutton-in-Ashfield bus station and passenger waiting facilities across Nottinghamshire.	Bus service provision is provided on a commercial basis with support from EMCCA where justified; and reviewed periodically. Pressure on bus service budgets due to cost inflation and the current fuel crisis.
29	**Encouraging the use of emissions standards when procuring school bus contracts and supported bus services**	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	-	On-going	EMCCA / PT operators	PT operators	Funded	-	Implementation	Reduced emissions of N02 and PM	Reduced emissions and ongoing take-up of cleaner vehicles	On-going take-up of LEVs	Funding details not known as its funded commercial private operators
30	**Bus stop clearways**	Traffic Management	UTC, congestion management, traffic reduction	-	Ongoing	EMCCA / NCC, NCiC	NCC	Funded	£50k - £100k	Implemented and ongoing	Reduced vehicle emissions	Manage parking to improve	Bus stop clearways are introduced at bus stops within the county, where	

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												journey time reliability	parked vehicles are identified as impeding traffic flows. CCTV enforcement car introduced in 2016, second vehicle purchased in 2018; and third vehicle introduced in 2019. Static CCTV Enforcement also being used at bus stops across the network where required	
31	**Bus infrastructure**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	-	Ongoing	EMCCA, NCC	EMCCA	Funded	£1m-£10m	Implementation	Reduced emissions of N02 and PM due to increased passenger transport patronage	Increased passenger transport patronage	An annual programme of bus infrastructure improvements is delivered as part of the integrated transport block programme, including the installation of new bus shelters and real time bus information, and the update/maintenance of all stops e.g. updating network maps to ensure all information is current and accurate.	
32	**Bus fleet zero emission vehicles**	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	2025	On-going	EMCCA / PT operators	EMCCA	Funded	>£10million	Implementation	Reduced emissions of N02 and PM due to increased use of low emission vehicles	Reduced emissions and ongoing take-up of cleaner vehicles	£5.3m of funding secured to support delivery of electric buses in Mansfield in 2026, with further investment planned for 2027. 33 x electric buses to be implemented in Nottingham in Autumn 2026. 10-year electric bus investment pipeline under development to support	
33	**Under 22s Young Persons' Ticket**	Transport Planning and Infrastructure	Other	2022/ 2023	2025	EMCCA / PT operators	EMCCA	Funded	-	Implemented	Reduction in N02 and PM due to increased passenger transport patronage	Increased passenger transport patronage	BSIP funding secured to launch an Under 22 young persons' ticket for use in Greater Nottingham and Nottinghamshire providing an extension of under 19s discounted travel to under 22s. It was launched in September 2023 and is due to run until March 2025, at which point the scheme will be reviewed Under 22 Scheme | Nottinghamshire County Council **Update:** it is still being delivered and will be	

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													reviewed at the end of 26/27	
34	**Crossings facilities as part of Active Travel Funding (ATF) Tranche 5**	Transport Planning and Infrastructure	Other	2026	On-going	NCC	Active Travel Fund (ATF)	Funded	£100k - £500k	Planning	Reduced emissions of N02 and PM due to more people walking	Increased walking trips	The government awarded the East Midlands Combined County Authority (EMCCA) £1.7m as part of Active Travel Fund Tranche 5. As a constituent authority of EMCCA, NCC were awarded £0.49m of the funding for the development and construction of the following schemes: • A60 Loughborough Road, Bunny - Pedestrian refuge • A638 London Road, Retford - Toucan crossing • B6006 Wollaton Road, Beeston - Puffin crossing, and • B6030 (east of the B6034), Edwinstowe - Pedestrian crossing facility at junction The schemes on A60 Loughborough Road, Bunny; A638 London Road, Retford; and B6006 Wollaton Road, Beeston are in the development phase and are subject to the necessary design, consultation and approval processes. Construction of the scheme on B6030, Edwinstowe is to be completed in March 2026.	B6030 (east of B6034), Edwinstowe is complete. A60 Loughborough Road, Bunny; A638 London Road, Retford; and B6006 Wollaton Road, Beeston are still in progress. 2026
35	**Marketing and promotion of passenger transport**	Promoting Travel Alternatives	Other	-	On-going	EMCCA / PT operators	EMCCA	Funded	Within existing Resources	On-going	Reduction in $N0_2$ and PM as increased bus patronage	Increased passenger transport patronage	NCC undertakes various marketing campaigns in partnership with operators and NCiC – coordinated through the Greater Enhanced Partnership. Sales & Marketing Plan continues to be delivered to help promote public transport. Network maps produced to coincide with route/timetable changes	

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36	**Sustainable Travel information for the Public**	Public Information	Via the internet	2010	On-going	BBC Climate Change Manager	LA-BBC	Not Funded	Within existing resources	On-going	Reduced Emissions of NO_2 and PM	Increased use of public transport	• The Travel Choice website provides information and advice to residents, jobseekers and businesses, on sustainable travel options within the county • School travel Toolkit (see measure **No.66**) • BBC have leaflets on safe cycling on the tram lines, bus routes, Broxtowe cycling map, Broxtowe Country and Erewash Valley routes and walking leaflets. These are all available in the Council reception. • Sustainable Travel methods are also available on the main council website.	On-going
37	**Concessionary fare schemes**	Transport Planning and Infrastructure	Other	On-going	On-going	EMCCA / PT operators	EMCCA	Funded	> £10 million	Implementation	Reduced emissions due to increased bus patronage.	Increased passenger transport patronage	Countywide off-peak concessionary public transport fare scheme available for the over 60s and disabled. Targeted ticketing discounts for young people.	
38	**Taxi Licensing Conditions**	Promoting Low Emission Transport	Taxi Licensing conditions	2018	On-going	BBC Licensing Team - Licensing Manager	N/A	Not Funded	N/A	On-going	Reduction in NO_2 and PM as cleaner vehicles	Recued Emissions	No vehicle older than 8 years will be licensed on first application. Petrol fuelled vehicles must be Euro 5 or above Diesel fuelled vehicles must be Euro 6	On-going
39	**To Increase the number of low emission and electric vehicles licensed as Taxis by Broxtowe Borough Council.**	Promoting Low Emission Transport	Taxi Licensing conditions	2020	On-going	BBC Licensing Team - Licensing Manager	N/A	Not Funded	N/A	On-going	Reduction in NO_2 and PM as cleaner vehicles	Number of LEV and Electric Vehicles licensed within the borough as Taxis	Broxtowe Borough Council currently licence 5 Electric vehicles, 44 Hybrid vehicles and 51 Euro 6 Vehicles out of the 100 Vehicles that are licensed to operate as Taxis. This is an increase from last year.	On-going
40	**To Investigate the feasibility of incentives for Taxi Drivers to purchase low emission or electric vehicles**	Promoting Low Emission Transport	Taxi emission incentives	2020	2024	BBC Licensing Team - Licensing Manager	N/A	Not Funded	N/A	Planning	Reduction in NO_2 and PM as cleaner vehicles	% uptake of the incentive if implemented.	The Implementation of National Standards in November 2022 were not in relation to LEV or electric vehicles. Therefore, a project of looking at incentives for drivers of low emission vehicles needs to be looked at.	On-going

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41	**To consult with Taxi Trade about Increasing the number of Low Emission and Electric vehicles licensed**	Promoting Low Emission Transport	Other	2020	2025	BBC Licensing Team - Licensing Manager	N/A	Not Funded	N/A	Planning	Reduction in $N0_2$ and PM as cleaner vehicles	Increase in the number of LEV and Electric Vehicles licensed within the borough as Taxis	This needs to be looked at when the results of measure 39 are known. In order to increase numbers, we need an incentive to purchase LEV and Electric vehicles.	On-going
42	**To amend the Taxi Policy as required following consultation on Increasing the number of low emission and electric vehicles licensed**	Policy Guidance and Development Control	Other policy	2020	2025	BBC Licensing Team - Licensing Manager	N/A	Not Funded	N/A	Planning	Reduction in $N0_2$ and PM as cleaner vehicles	Number of LEV and Electric Vehicles licensed within the borough as Taxis	The Taxi Policy will need amending once Measures 38 and 39 have been concluded	Ongoing
43	**To Replace older combination boilers and system boilers to Seasonal Efficiency of a Domestic Boiler in the UK (SEDBUK) A rated condensing boilers**	Other	Other	2020	On-going	BBC Capital Works - Capital Works Manager	LA-BBC	Funded	£10k -£50k	On-going	Reduced emissions due to more efficient boilers	Number of boilers replaced	•The replacement of the remaining less efficient units (less than 1%) is planned. The typical life cycle of a unit is 15 years. Therefore, the current stock needs to be replaced as it becomes beyond its serviceable life. This is a 15 year Rolling program	On -going
44	**To Install Air Source Heat pumps on all new builds owned by the Council (Except Section 106)**	Other	Other	2021	2024 and On-going	BBC Capital Works - Capital Works Manager	LA-BBC and Homes England	Funded	£1m/£10m	Implementation and on-going	Reduced emissions due to more efficient boilers	Increase in new builds having air Source heat pumps as a form of heating	Air source heat pumps are now installed in the Councils new build properties	On-going
45	**To investigate and consider suitable alternative replacements for the remaining electrically heated Council properties**	Other	Other	2020	2025 On-going	BBC Capital Works - Capital Works Manager	LA-BBC	In existing funds	£100k/£500k	Success of the trials for cleaner heating technology	Reduced emissions due to more efficient and cleaner technologies to heat the council properties	Efficiency rating of new heating replacements.	• High heat retention units were being fitted as replacements in 2022 and this will be continuing in future years •Air source heat pumps will also be considered at suitable properties where a retro fit solution is possible.	On-going Approx 60 properties left to replace
46	**Low Emission Vehicle Procurement**	Promoting Low emission transport	Company vehicle Procurement - prioritising uptake of low emission vehicles	2017, 2019 and 2020	2024	BBC Transport and Stores Manager	LA-BBC	Funded	£10k - £50k	On-going	Reduced Emissions of N02 and PM	Reduction in $N0_2$ and PM due to cleaner vehicle technology	• All new fleet vehicles at BBC are Euro6 emissions complaint. There are 95 fleet vehicles, and they are on a 12-year replacing rolling programme. • BBC has purchased two new Euro 6	A report is being prepared to take to cabinet to reduce the cycle from 12 years to 7 years

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													Refuse Collection vehicle in the financial year 25/26 replacing two older vehicles. • BBC currently operate a fleet of 10 electric vans	On- going
47	**To develop a plan for future infrastructures to support growth in BBC's Electric Fleet and the domestic use of Electric Vehicles**	Vehicle Fleet Efficiency	Other	2020	2025-2026	BBC Transport and Stores Manager	LA-BBC and External grant – Grant provider not currently known	-	>£10 million	Planning	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	Reduction in $N0_2$ and PM due to cleaner vehicle technology	A review is currently being undertaken to determine the necessary infrastructure to accommodate the move to an electric fleet. This is being undertaken in partnership with Midlands Zet Zero Hub. Update: This is still cost prohibitive and no decision will be made regarding EV infrastructure until a clear picture of LGR has been established and decisions regarding the future of the Kimberley Depot have been agreed.	Prohibitive cost 2025/2026
48	**To investigate the viability of obtaining equipment and software that will record BBC Fleet Vehicle driver's behaviour, and enable a training programme to be established to improve efficiency**	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2020	2025-2026	BBC Transport and Stores Manager	LA-BBC	Funded	Within existing resources	Planning	Reduction in $N0_2$ and PM due to improved driving efficiency.	Number of employees that have undergone driver training.	An investigation into the viability of obtaining equipment and software that will record driver behavior and enable a training programme to be established. The purchase of undated hardware is being proposed **A** business case for the purchase and subscription of Tachograph analysis software has been submitted for ICT review. **Update –** The above business case is having to be redrafted with a new software supplier, and the identified provider did not meet the security requirements demanded by the Head of ICT.	2025/26 On-going
49	**Capital Fleet Vehicle Replacement for HGV's**	Vehicle Fleet Efficiency	Other	2020	2021-2024	BBC Transport and Stores Manager	LA-BBC	Funded	£500k - £1 Million	On-going	Reduction in $N0_2$ and PM due to replacement of older HGV's.	Number of replacement HGV's	The Capital Vehicle Fleet replacement programme for HGV's (Refuse Freighters 26 Tonnes) identified for replacement will be replaced with Euro standard engines (Euro 6 onwards). • £750k per annum • Before purchasing, consideration will be	On-going

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													given based on practicality and economics of the adoption of new technologies that have come to market. This includes Electric and Hydrogen Propulsion methods.	
50	**Vehicle Emissions Testing**	Vehicle Fleet Efficiency	Testing Vehicle Emissions	On-going	On-going	BBC Transport and Stores Manager	LA - BBC	Not Funded	Within existing resources	On-going	Reduction in $N0_2$ and PM as regular serviced and maintained vehicles to ensure they are operating efficiently.	Reduced emissions	•All BBC Fleet vehicles are annually emission tested in house prior to MOT Emission testing. • BBC also undertakes additional emissions tests on all fleet vehicles if any new fuel or engine components have been changed. This is to ensure vehicle emission compliance. • **Update:** All BBCs commercial fleet of vehicles (95) are now being fuelled with HVO instead of Diesel.	On-going On-going On-going
51	**To provide all new allotment tenants within the borough, a Tenancy agreement regarding bonfires.**	Public Information	Other	2012	On-going	BBC Parks and Open Spaces – Environmental Development Officer	LA-BBC	Not Funded	N/A	On-going	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	All new allotment tenants within the borough are provided with a tenancy agreement which includes the following information: bonfires should only be used on very rare occasions, and due consideration for other allotment holders and neighbouring properties must be used at all times. They must only be in the period 1st October to 31st March and only used to burn non compostable garden waste that is produced on the allotment.	On-going
52	**To regularly communicate with all allotment providers in the borough to discourage the use of bonfires to dispose of garden waste**	Public Information	Other	2023	2024	BBC Parks and Open Spaces – Environmental Development Officer	LA-BBC	Not Funded	N/A	Planning	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	In January 2027 the allotment newsletter will include a section about bonfires and discouraging them, and using alternative methods to dispose of garden waste	2027

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53	**To investigate the feasibility of increased provision for cycle parking in the Borough**	Alternatives to private vehicle use	Other	2022	2025/26	BBC Head of Economic Development and Regeneration.	UKSPF & MHCLG LRF	Funded	Not yet calculated	Planning	Reduced Emissions of NO_2 and PM	No of cycle parking spaces in the borough	Additional cycle facility projects have been installed in Stapleford, (3 different sites). Kimberley 2 x sites and Eastwood	Of the three routes investigated in 2025 only one remains viable - provided that funding from Sustrans is attained
54	**To investigate the provision of an E bike Scheme within the borough**	Alternatives to private vehicle use	Other	2024	2026	BBC Head of Economic Development and Regeneration.	LA-BBC, UKSPF and private sector	Funded	<£10k	Planning	Reduced Emissions of NO_2 and PM	Number of Kilometres cycled	A pilot has been introduced for an E bike Scheme within the borough (currently just in Beeston) Lime bikes are the delivery partner	Update will be provided in the 2027 ASR
55	**Improving the cycle network in Stapleford**	Transport Planning and Infrastructure	Cycle Network	2022	2026	BBC Economic Development - Regeneration Projects Manager	Stapleford Towns Deal	Funded	£1m-£10m	Planning	Reduced Emissions of NO_2 and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to improve and encourage cycling within Stapleford by improving the cycling infrastructure. Work continues to improve the paths within Stapleford; the cycle network has been scaled back and focus on All travel routes. Footpath and crossing improvements as well as path widening and access gates to recreational grounds are all due to completed summer 2026.	Rising costs for required LTN/120 Standards, changes and adaptations to cycle path routes have delayed and reduced the scale of the projects.
56	**To develop and Improve the Cycle Network from Newdigate Street, Kimberley to Low Wood Road, Nuthall**	Transport Planning and Infrastructure	Cycle Network	2025	TBA	BBC Kimberley Means Business Manager	Kimberley Means Business project	Not Funded	£500k - £1m	Planning	Reduced Emissions of NO_2 and PM	Reduced emissions due to increase in cycling	• To develop and improve cycle routes between Kimberley School on Newdigate Street and Low Wood Road.as part of the Kimberley Means Business project. • To Improve the route, the lighting and surfaces of other paths used by walkers and cyclists.	Completion is now dependent on further funding. A full feasibility plan has been developed with Sustrans and the scheme can be considered 'shovel ready' KMB finance was diverted to other, more viable, projects.
57	**Installation of EV Fuel Charging Points**	Transport Planning and Infrastructure	Other	2026	2026/27	BBC Kimberley Means Business Manager	Kimberley Means Business Project	Funded	£25k-£50k	Under Construction	Reduced Emissions of NO2 and PM	Reduced emissions due to use of electric fuel rather than petrol/diesel	Installation of 6 EV charging points at Viaduct View Business Park with further 4 points planned for Giltway development	
58	**Cycle Repair Workshops**	Alternatives to Private Vehicle use	Other	2022	2023	BBC Economic Development - Regeneration Projects Manager/ RideWise	Stapleford Towns Deal/ RideWise	Funded	£10-£50k	Implemented	Reduced Emissions of NO_2 and PM	Reduced emissions due to increase in cycling	RideWise continue to support the Cycle Hub. They have supported 1642 people to date with bike repairs.	Grant funds are now complete. RideWise are now in a trial period to test out a sustainable

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														option for the cycle hub.
59	**Cycling network and Infrastructure**	Transport Planning and Infrastructure	Cycle network	2018/19	On-going	NCC / Via EM	LGF/ DfT / developer contributions	Not Funded	Various	Planning	Reduced Emissions of N02 and PM	Increased cycling trips	• Cycling infrastructure improvements are delivered as part of NCC's annual integrated transport programme. However, costs are extremely high so NCC requires external funding to deliver them. NCC submits bids for Active Travel England funding through EMCCA, and districts secure developer contributions for improvements as part of new developments. The D2N2 Local Cycling and Walking Infrastructure Plan (LCWIP) will be used to help identify and prioritise future improvements should DfT funding be made available for their delivery.	•The D2N2 LCWIP will be used to help identify potential future cycle improvement schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals. •A potential barrier to such projects is the availability of funding, feasibility and public acceptable of proposals.
60	**Cycling networks as part of Active Travel Funding (ATF) Tranche 4**	Transport Planning and Infrastructure	Cycle network	2023	On-going	NCC	Active Travel Fund (ATF)	Funded	£1 million - £10 million	On-going	Reduced Emissions of N02 and PM	Increased cycling trips	• In May 2023, the government announced that NCC were successful in securing £1.1m from Tranche 4 of the Active Travel Fund (ATF), for the development of a new walking and cycling facility along Baulk Lane, Stapleford. The scheme is due to be completed in March 2026.	Due to be completed in March 2026
61	**Cycling network and infrastructure as part of Towns Fund**	Transport Planning and Infrastructure	Cycle network	2015	On-going	BBC/NCC / Via EM	Towns Fund	Funded	£1 million - £10 million	On-going	Reduced Emissions of N02 and PM	Increased cycling trips	• Cycle hub installed at Beeston Train Station in 2015 to integrate with bus/rail services. •BBC's Town Fund included cycle/pedestrian infrastructure (funding amount to be determined by Board and scheme proposals subject to feasibility, consultation, and	A potential barrier to such projects is lack of future revenue funding. The Towns Fund funded proposals are still subject to feasibility, consultation,

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													County Council Cabinet Member approval). Improvements and new crossing on Pasture Lane underway.	and County Council Cabinet approval.
62	**Cycle training**	Promoting Travel Alternatives	Promotion of cycling	Circa 1970s	Ongoing	NCC	DfT funding/PH funding	Funded	Various	Implemented and On-going	Reduced Emissions of N02 and PM	Increased cycling trips	• Across the county, 4,782 people received cycle training during 2025/26 and in Broxtowe specifically, training was delivered to 561 people. • Implementation is ongoing.	Figures provided include attendees from Bikeability, Learn to Ride and Balanace Bike sessions. Cycle training delivery is planned to be scaled up over the coming years.
63	**Marketing of cycling**	Promoting Travel Alternatives	Promotion of cycling	2010 and 2017	On-going	NCC	NCC	Not Funded	within existing resources	Implemented and on-going	Reduced Emissions of N02 and PM due to increased cycling uptake	Increased cycling trips	•Marketing of cycling is undertaken in a variety of formats for both commute and leisure trips. Various NCC campaigns have been undertaken including 'cycling week', 'Notts Routes & Rides' and cycle maps. NCC's website and Travel Choice webpages provide information on cycling across the county (for residents and businesses)	Travel Choice website: Nottinghamshire County Council Cycle
64	**Marketing of walking**	Promoting Travel Alternatives	Promotion of walking	-	On-going	NCC	NCC	Funded	Within existing resources	Implemented and on-going	Reduced Emissions of N02 and PM due to more people walking	Increased walking trips	General promotion (e.g. website and literature) ongoing. • NCC's website and Travel Choice webpages provide information on alternatives to using private vehicles, including cycle maps, leisure 'Routes and Rides' and the Rights of Way network	Travel Choice website: Nottinghamshire County Council Walk
65	**Pedestrian infrastructure improvements**	Transport Planning and Infrastructure	Other	2020	On-going	NCC / Borough and District Councils	NCC and various other sources of funding e.g. S38, S278 and S106	Funded	£100k to £500k	On-going	Reduction in NO_2 and PM emissions as more people are walking	Increased walking trips	Pedestrian improvements (e.g. pedestrian crossing, dropped kerbs, footways) are developed and delivered as part of NCC's annual integrated transport programme. • In addition to the integrated transport block funding, improvements are also delivered using funding secured through	• NCC's annual integrated transport programme is published on the Council's website: Decision Details: Highways Capital and Revenue Programmes 2025-26

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													the planning process (e.g. S38, S106, S278).	• Schemes identified are subject to feasibility and availability of funding. A potential barrier to such schemes is the lack of future funding.
66	**School travel plans**	Promoting Travel Alternatives	School Travel	2000	On-going	NCC	NCC	Not Funded	£10k - £50k	Completed	Reduced Emissions of N02 and PM if alternative methods of sustainable travel are used	Restrain average journey times in the morning peak to a 1% increase per year	• Following a trial with four pilot schools in 2019/20, the online school travel toolkit was rolled out to all County schools during the 2020/21 academic year. • The Nottinghamshire School Travel Toolkit provides school children, parents and staff with information and advice on improving travel to and from Nottinghamshire's schools.	Costs detailed are for the School Travel Toolkit only. There currently is not any funding available for delivering travel planning to individual schools. Link to School travel toolkit: School travel toolkit
67	**Web based journey planners**	Public Information	other	2019	On-going	EMCCA	EMCCA	Funded	within existing resources	Implemented	Reduction in NO_2 and PM due to increase in sustainable travel	Increased walking/cycling/ passenger transport trips	Ride Journey Planner and Ticketing App implemented Ride UK	
68	**Personalised travel planning**	Promoting Travel Alternatives	Personalised Travel Planning	2010	On-going	NCC / AECOM	DfT Access Fund	Funded	£50k - £100k	Completed	Reduction in NO_2 and PM due to increase in sustainable travel	Restrain average journey times in the morning peak to a 1% increase per year	• NCC have delivered Personalised Travel Planning (PTP) to residents, jobseekers, workplaces and schools across various parts of the county, over a number of years: including Beeston, West Bridgford, Newark, Ashfield, Mansfield and Worksop The 2024 Capability Fund funded PTP project was delivered in Stapleford, during Summer 2025 with 4,024 households targeted and 865 households engaged. The 2025 Capability Fund will be used to deliver a further PTP project, likely targeting households in Colwick during the Summer of 2026	Future PTP will be delivered should revenue funding sources be identified and secured for its delivery. Future capability funding will go directly to EMCCA to distribute to LAs

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69	**Car Lease Scheme for BBC employees**	Promoting low emission transport	other	2021	On-going	BBC Human Resources - Human Resources Manager	LA-BBC	Not Funded	-	Implementation	Reduction in NO_2 and PM	Number of employees leasing ULEV	• BBC has introduced a Car Lease Scheme in 2021 for employees, to encourage an uptake in ULEV to reduce emissions. This also includes electric vehicles. 7 employees have made use of the scheme, utilising EV/ULEV cars. 2 employees have returned vehicles, and 5 vehicles are currently being leased. Two of those employees is on their second vehicle.	Increase car costs also may limit affordability.
70	**Encouraging the use of Hybrid or Electric vehicles for BBC employees**	Promoting Low Emission Transport	Other	2020	On-going	BBC Payroll and Job Evaluation Manager	LA-BBC	Funded	Within existing resources	Implementation	Reduction in NO_2 and PM	Number of employees using hybrid or electric vehicles	•To encourage employees of BBC to purchase hybrid vehicles and electric vehicles for their personal/ business use. Eleven employees used a personal Electric vehicle and five used a ULEV in 2025.	On –going
71	**Investigate the feasibility of a Council staff car sharing**	Alternatives to Private Vehicle Use	Car Clubs	2020	On-going	BBC Human Resources - Human Resources Manager	N/A	Not Funded	N/A	Planning	Reduction in NO_2 and PM	No of staff car sharing	Due to Covid-19 being prevalent and it is transmissible in confined spaces; this measure has been put on hold temporarily. However, staff in the future will be encouraged to travel together. Car clubs are going be explored in 2025/26 An understanding of the infrastructure and availability/feasibility will be key to determining success. No further investigations have taken place due to capacity and staffing changes	No progress
72	**Promoting travel choices - Consideration of car club into the county**	Alternatives to private vehicle use	Car Clubs	2023		NCC	NCC	Not Funded		On-going	Reduced emissions of N02 and PM	Restrain average journey times in the morning peak to a 1% increase per year. A reduction in staff business emissions and cost, through both a car club and a wider	NCiC scheme introduced in 2014, with the provider reviewed in 2018. Expansion of scheme into county dependent on its success, which is still unclear. • Work has been undertaken to look at the feasibility of a partnership with a Car	Dependent on the determination of business case and commercial operator coming forward. Barriers include financial risk, organisational culture (i.e. using personal cars less) and

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												review of staff travel habits.	Club operator in the county, for both residents and internal use (i.e. staff travel). The work will feed into a wider fleet review and review of staff business travel, with a few more aspects to be expanded upon. Funding for implementation to be determined.	specific service needs.
73	**Cycle to work Scheme**	Promoting Travel Alternatives	Promotion of cycling	2009	On-going	BBC Payroll and Job Evaluation Manager	N/A	Not Funded	Within existing resources	On-going	Reduction in $N0_2$ and PM	No of bikes purchased through scheme	•Cycle to work Scheme – to assist and give tax relief on bike purchases for employees of BBC. Six employees purchased a bike through this scheme in 2025. Since the scheme started 200 employees have purchased bikes through the scheme. Mileage when using a bicycle is now paid at a higher rate of 45p per mile.	On-going
74	**Flexible working arrangements**	Promoting Travel Alternatives	Encourage/Facilitate Home Working	2012	On-going	NCC and BBC Human Resources - Human Resources Manager	N/A	Not Funded	N/A	On-going	Reduction in $N0_2$ and PM due to employees not commuting	Restrain average journey times in the morning peak to a 1% increase per year	•NCC operates flexible working arrangements for all its staff. •BBC New Ways of Working was introduced in 2019, which allows and encourages employees to work from home when practical to do so.	On -going Agile working at BBC continues to benefit the organisation and give employees flexibility to effectively discharge their duties and minimize unnecessary travel.
75	**To reschedule the dry recycling waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Other	2020	2025	BBC Environment – Interim Director of Environment and Leisure	N/A	Not Funded	N/A	Planning	Reduction in $N0_2$ and PM due to efficient routes.	Reduced emissions	The round reschedule is currently in progress. Completion is anticipated in April 2026.	Once the main review has been undertaken, the route optimisation software that has been purchased will help to ensure that the on-going refuse rounds are working as efficiently as possible.
76	**To reschedule the green waste rounds to reduce fuel consumption and improve efficiency**	Vehicle Fleet Efficiency	Other	2020	On-going	BBC Environment – Interim Director of Environment and Leisure	N/A	Not Funded	N/A	Planning	Reduction in $N0_2$ and PM due to efficient routes	Reduced emissions	The garden waste rounds are dictated by the number of subscribers to the service, and this is reviewed on an annual basis.	Route optimisation software will help to ensure that the on-going refuse rounds are

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														working as efficiently as possible.
77	**To report on the percentage of fleet fuel consumption sourced from HVO and other low-emission fuels.**	Vehicle Fleet Efficiency	Other	2026	On-going	BBC Environment – Interim Director of Environment and Leisure	N/A	Not Funded	N/A	Implementation	Directly reduces particulate matter (PM) and NOx emissions from fleet vehicles	Percentage of HVO and Low emission fuels usage.	To report on the percentage of fleet fuel consumption sourced from HVO and other low-emission fuels.	
78	**To reduce the Number of return visits due to missed bin collections**	Vehicle Fleet Efficiency	Other	2026	On-going	BBC Environment – Interim Director of Environment and Leisure	N/A	Not Funded	N/A	Implementation	Reduction in emissions as the number of repeated journeys are reduced	Reduced emissions	To reduce the Number of return visits due to missed bin collections - Monitored and reported on weekly	
79	**Development of regional public transport ticketing**	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2014	Ongoing	EMCCA / PT operators	EMCCA	Funded	>10Million	Implementation	Reduction in $N0_2$ and PM due to increased passenger transport patronage	Increased passenger transport patronage	Mulit-operator ticketing already in place locally, this will be augmented once the regional ticketing strategy has placed which will extend fare capping using contactless payment and enable "best fare" travel across bus and tram throughout the region.	Big IT project, being delivered at a national scale under the auspices of "project coral" which has its benefits and risks. Involves complex commercial agreements with operators.
	To replace cremators and associated plant including abatement system at Bramcote Crematorium	Environmental Permits	Other	2023	2025	BBC Project Manager, Capital Works	General fund, borrowing 50-50 split with Erewash Borough Council	Funded	£1m-£10m	Completed	Reduced Emissions	Reduced emissions due to more efficient cremators and plant	Measures to reduce pollution through replacing the current cremators to ones that using the Best Available Techniques (BAT) which are the best for preventing or minimising emissions and impacts on the environment. The new cremators are installed, and the new abatement plant was installed in the summer of 2025.	**Complete**
	Implementation of the Smoke Control Order	Policy Guidance and Developmental Control	Other Policy	2024	2030	BBC – Public Protection – Senior Environmental Health Officer	LA-BBC	Funded	£1k -£10k	Completed	Reduction in particulates	Completion of implementation plan	• The Order was sealed by BBC and approved by Defra in late 2024. The Smoke Control Order came into force in June 2025.	**Complete**
	To undertake a data quality review of boiler information held for Council Properties to determine whether they have been included in the replacement programme.	Other	Other	2020	2024	BBC Capital Works - Capital Works Manager	LA-BBC	Funded	£10k -£50k	Complete	Reduced emissions due to more efficient boilers	Identifying the number of boilers that need replacing	BBC will be undertaking a data quality review on boiler information held for the properties in question as we believe these may have already been incorporated in replacement programmes - this was completed in 2024.	**Complete**

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	To investigate and consider new heating technologies that are more efficient, effective and produce lower emissions	Other	Other	2020	2021 and ongoing 2023	BBC Capital Works - Capital Works Manager	Better Care fund	Funded	£50k - £100k	Complete	Reduced emissions due to more efficient boilers	Success of the trials for cleaner heating technology	Currently reviewing the development of hydrogen technology for boilers. Studies show that the emissions are reduced greatly. Subject to existing networks and Government. •A trial was undertaken for fitting air source heat pumps in 7 new builds in 2021 and in 5 new builds in 2022.	**Complete** - The trail was completed and included in future specifications to install air source heat pumps instead of gas boilers if possible Air source heat pumps are now installed in the Councils new build properties (except Section 106)
	Investigate ways to decarbonise BBC's fleet through alternative fuels	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2021	2024	BBC Environment - Head of Environment	LA-BBC	Not Funded	£100k - £500k	Complete	Reduction in $N0_2$ and PM	Reduced emissions	• A report was submitted to Cabinet in July 2023, which approved the transition to HVO. The transition took place in April 2024.	**Complete** – all refuse vehicles and fleet vehicles (where appropriate) are HVO. This has resulted in a 95% reduction in fleet emissions and a 31% reduction in the Council's own operation carbon footprint.
	Installation of 7kW electric vehicle (EV) chargepoints at BBC Kimberley Depot for Public Sector Fleet Vehicles	Vehicle Fleet Efficiency	Other	2023	2025	BBC Transport and Stores Manager	Future Transport Zones (FTZ) funding	Funded	£10k - 50k	Completed	Reduced Emissions of N02 and PM	Reduction in N02 and PM due to cleaner vehicle technology	Four new 7kW electric vehicle (EV) charge points were installed at Kimberley Depot (increasing the number to six.) in 2024 • Nottingham City Council was awarded a grant as part of the Future Transport Zones (FTZ) funding, to develop and operate an EV charging network across the Nottingham, Nottinghamshire, Derby and Derbyshire (D2N2) region. The charge points when installed will form part of a network of public sector organisations who have agreed to share the EV chargepoints which will enable the delivery of collective efficiencies in EV operations across the region. • These chargepoints are for the use of any Council operated fleet	**Complete**

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													across the region. **BBC's financial contribution for these was: £15,796**	
	To write an Electric Vehicle Infrastructure (EVI) Strategy for the Borough of Broxtowe	Promoting Low Emission Transport	Procuring alternative refuelling infrastructure to promote low emission vehicles, EV charging, gas fuel charging	2023	2024	BBC Climate Change Manager	LA-BBC	Not Funded	Within existing resources	Completed	Reduced Emissions	Improving Air Quality, reduced Emissions by promoting EV charging locations	The Strategy is to facilitate access to a reliable Electric Vehicle Infrastructure (EVI) for residents, businesses and visitors, which will help to support the decarbonisation of transport and travel within the Borough. • The Management Strategy for the expansion of EVI across Broxtowe Borough is going to Cabinet in July 2024. • **UPDATE** – This was approved in July 2024	**Complete - -** Adopted in July 2024.
	To revoke the current Smoke Control Orders and introduce a new single Smoke Control Order which will be supported the Smoke Control Order Enforcement Policy	Policy Guidance and Development Control	Other Policy	2023	2024	BBC Public Protection - Senior Environmental Health Officer	Defra	Funded	£10k -£50k	Completed	Reduction in Particulates	% of people not complying with the Enforcement Policy	Broxtowe Borough Council has also formally adopted a Smoke Control Order Enforcement Policy in October 2023 to support enforcement of its Order and enable improved future regulation of the issue. Public consultation will be undertaken in 2024 about Revoking the Previous smoke control Orders and to introducing a new Smoke Control order (Minus the moored vessels) The Council have therefore made a Smoke Control Orders Revocation Order, and this will be consulted on and subject to Secretary of State approval, be brought into effect replacing all current smoke control orders.	**Complete -** The Order was sealed by BBC and approved by Defra in late 2024.
	To Undertake phase two of the public consultation on Smoke Control Areas to Revoke the Previous Smoke Control Orders and to introduce the new Smoke	Public Information	Other	2022	2024	BBC Public Protection - Senior Environmental Health Officer	Defra	Funded	<£10k	Completed	Reduction in Particulates	% of people that responded to the public Consultation	To undertake public consultation on Smoke Control Areas. Revoking the Previous smoke control Orders and to introducing the new Smoke Control order (Minus the moored vessels) This was undertaken in 2024.	**Complete**

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	Control order (minus the moored Vessels)													
	Undertaken Phase 1 public consultation on Smoke Control Areas introducing the new Smoke Control order including Moored Vessels	Public Information	Other	2022	2023	BBC Public Protection - Senior Environmental Health Officer	Defra	Funded	<£10k	Completed	Reduction in Particulates	% of people that responded to the public Consultation	To undertake public consultation on Smoke Control Areas introducing the new Smoke Control order. This was undertaken in 2023	**Complete**
	To write a Smoke Control Order Enforcement Policy and to get BBC to formally adopt it.	Policy guidance and Development Control	Other Policy	2022	2023	BBC Public Protection - Senior Environmental Health Officer	LA-BBC	Funded	Within existing resources	Completed	Reduction in Particulates	Improving Air Quality by taking action to reduce Emissions	• To write a Smoke Control Order Enforcement Policy and to get BBC to formally adopt it. • Broxtowe Borough Council has also formally adopted a Smoke Control Order Enforcement Policy in October 2023 to support enforcement of its Order and enable improved future regulation of the issue.	**Complete**
	Investigation into whether it is feasible for free parking in the borough car parks for Electric and Hybrid vehicles	Traffic Management	Emission based parking or permit charges	2020	2021 2023	BBC Parking services – Parking Manager	LA - BBC	Funded	Currently unknown	Completed	Reduction in $N0_2$ and PM by encouraging ULEV to utilise free parking	% Usage of spaces for Electric and Hybrid vehicles if this measure is introduced	•There are currently 28 x 7KW Electric Vehicle spaces, an x 2 rapid Electric Vehicle charging spaces, totalling 30 spaces. • To be explored as part of the new Electric Vehicle strategy. It is currently not free to park and this would need consideration by members Any free provision would have to be managed by limiting time, otherwise it would reduce the availability of spaces for Electric Vehicles **UPDATE:** BBC's Committee reviewed the report in October 2023 and voted against free parking in the borough for Electric and hybrid vehicles.	**Complete.**
	To take on the provision of the cycle store at Beeston's Railway Station	Alternatives to private vehicle use	Other	2022	2024	BBC Head of Asset Management	LA-BBC	Funded	<£10k	Completed	Reduced Emissions of $N0_2$ and PM	Number of bikes using the cycle store	Due to the risk of closure, BBC have taken over the provision of the cycle store at Beeston Railway station, to ensure that it is still	**Complete**

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													available for the public to use.	
	To install a cycle track on the Ilkeston Road Recreational Ground in Stapleford	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	Funded	£100k-£500k	Completed	Reduced Emissions of $N0_2$ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to improve and encourage cycling within Stapleford. A new cycle track was installed on the Ilkeston Road Recreational Ground in Stapleford in Works completed in March 2023	**Complete**
	To install a Cycling proficiency track to assist children/adults when learning to ride bikes	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	Funded	£100k-£500k	Completed	Reduced Emissions of $N0_2$ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. A new cycle proficiency track was installed on the Ilkeston Road Recreational Ground in Stapleford in Works completed in March 2023	**Complete**
	To install bicycle parking stands at the Ilkeston Road Recreational Ground in Stapleford	Promoting travel Alternatives	Promotion of Cycling	2022	2023	BBC Project Manager, Capital Works	Stapleford Towns Deal	Funded	£10k- £50k	Completed	Reduced Emissions of $N0_2$ and PM	Reduced emissions due to increase in cycling	Funds have been sourced through the Stapleford Towns Deal to encourage cycling within Stapleford. Nine new bicycle parking stands was installed on the Ilkeston Road Recreational Ground in Stapleford in Works completed in March 2023	**Complete**
	To investigate the feasibility of BBC employees having staff discounts with NET when using their trams	Alternatives to private Vehicles use	Other	2022	2023	BBC Human Resources - Human Resources Manager	LA-BBC	Not Funded	-	Completed	Reduction in $N0_2$ and PM due to increase in sustainable travel	Restrain average journey times in the morning peak to a 1% increase per year	To investigate the feasibility of BBC employees having staff discounts with NET when using their trams. Employees were surveyed to express an interest to determine feasibility of progressing discussions. **UPDATE**: Following discussions with NET in 2022, the employer must buy the tickets in advance – which makes feasibility difficult. Employees were asked to express an interest in potential tram discounts, but the interest was minimal.	**Complete**
	Car sharing scheme	Alternatives to private vehicle use	Car & lift sharing schemes	Early 2000s	2023	NCC	Local Authority	Funded	<£10k annually	Completed	Reduction in $N0_2$ and PM	Restrain average journey times in the morning peak to	• Covid-19 pandemic has impacted on people's travel to work patterns/behaviours,	**Complete** Funding could not be justified and hence

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												a 1% increase per year	which has impacted significantly on car sharing demand. • A review of the car sharing scheme found 3,250 members were registered, but not active. Activity and use of the scheme has been minimal for a number of years and consequently funding could not be justified and hence the licence has not been renewed.	licence has not been renewed.
	Development of Local Cycling and Walking Infrastructure Plan (LCWIP)	Transport Planning and Infrastructure	Cycle network	2019	2023	NCC/NCiC/DCC/DCiC/borough and district councils/Sustrans/other stakeholders	DfT funding	Funded	Within existing resources	Completed	Reduced Emissions of N02 and PM	Increased levels of cycling	• A D2N2 Local Cycling and Walking Infrastructure Plan (LCWIP) has been developed. • Data collected; three stakeholder events held to date, and further public engagement on the D2N2 LCWIP took place between December 2022 and March 2023. • The D2N2 LCWIP will become the responsibility of the East Midlands Combine County Authority (EMCCA) and will be reviewed and continue to evolve and develop over time.	Future countywide cycling infrastructure priorities will be identified through technical analysis undertaken as part of the LCWIP development (which along with other priorities, takes into consideration air quality) and will be subject to feasibility, consultation, and County Council Cabinet Member approval. The D2N2 LCWIP public engagement focused on cycle corridors only, and not specific schemes. Any future cycle improvement schemes will be subject to funding availability, feasibility consultation, and approvals.
	Electric Vehicle Fleet Procurement for	Vehicle Fleet Efficiency	Other	2019	2023	BBC Transport and Stores Manager	LA-BBC	Funded	£100k-£500k	Completed	Reduced Emissions of N02 and PM	Reduction in NO_2 and PM due to cleaner vehicle	•The Council currently has a fleet of 9 small vans (below 2 Tonnes). Two of these vehicles	

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	small vans below 2 tonnes											technology and the procurement of two electric fleet vehicles.	have been replaced with electric vehicles at a cost of £45k. •From 2021 to 2023 all 9 vehicles (small vans) have now been replaced with Electric Vehicles.	**Complete**
	Encouragement of low-emission public transport fleets	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	2018	2022	NCC/Operators	NCC/OLEV - Clean Bus Technology Fund	Partially Funded	£500k-£1Million	Completed	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	• NCC has invested £0.94m from the Clean Bus Technology Fund in Feb 2018 to retrofit older buses. This is in addition to operator investment in new Euro VI standard buses on some routes • Trentbarton invested in Euro VI vehicles for indigo and Rainbow 1 in 2020	**Complete**
	Review of on-streetcar parking in and around the AQMA	Traffic Management	Workplace Parking Levy, Parking Enforcement on highway	-	2022	NCC	LA-NCC	Funded	-	Completed	Restrain average journey times in the morning peak to a 1% increase per year	Reduced emissions by reducing congestion on the roads in and around the AQMA	• Introduction of junction protection and targeted roadside parking restrictions (including bus stop clearways) along feeder corridors into the AQMA to help traffic flows/journey times. • Parking restrictions already in place, no additional side-road/off-line locations currently identified as requiring restrictions to aid traffic flow; but annual programmes of such schemes are developed should any be required in the future	**Complete** **Complete**
	To raise awareness of anti-idling legislation with local bus companies and Taxi's that operate within the borough	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2020	2021 2022	BBC Public Protection – Environmental Health Officer	N/A	Not Funded	N/A	Completed	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	All local bus companies that operate within the borough were notified of anti-idling legislation and the associated health effects in 2021. All taxis that operate within the borough were notified of anti-idling legislation and the associated health effects via a leaflet in 2022	**Complete** **Complete**
	Increase the number of Electric Vehicle Charging Points in the Borough Car Parks.	Transport Planning and Infrastructure	Other	2020	2021	BBC Parking services – Parking Manager	BP charge master	Funded	70K for 14 x 7kw units and £90K for 2 x 50kw units	Completed	Reduction in $N0_2$ and PM due to increased use of electric vehicles.	% Usage of EVCP	•This is undertaken in association with BP chargemaster, who fund the capital and revenue for number of years BBC lose income by	**Complete**

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													dedicating spaces solely for Electric Vehicle use. . • 2 x rapid fast charges were installed at Victoria Streetcar park Stapleford in 2021; BBC has dedicated 4 spaces for Electric Vehicle use.	
	To Investigate providing all allotments within the borough with green waste recycling collections	Other	Other	2020	2021	BBC Environment - Head of Environment	LA-BBC	Not Funded	Within existing resources	Completed	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	• Multi team meeting taken place to discuss the feasibility of this. Several factors need resolving to determine whether this is a viable option. One allotment holders' group has been written too, in order to ascertain the extent of the waste produced. • Update: The investigation determined that providing all allotments with a garden waste collection was not feasible.	**Complete**
	To consult all tenants on one allotment site in the borough about a total ban on bonfires on allotment sites as a means of disposing of green waste	Public Information	Other	2020	2021	BBC Parks and Open Spaces – Environmental Development Officer	LA-BBC	Not Funded	N/A	Complete	Reduction in Particulates due to reduction of bonfires on site	Reduction in bonfires from allotments within the borough.	A questionnaire was sent to all allotment holders at one allotment site re waste. 118 questionnaires were sent, 57 were returned. 14 supported a ban, 41 said No, 2 didn't answer. 54 of the responses said that they do compost their green waste.	**Complete**
	Installation of new cycle stands in the Borough	Alternatives to private vehicle use	Other	2020	2021	BBC Head of Asset Management	LA - BBC	Not Funded	Within existing resources	Completed	Reduced Emissions of N02 and PM	No of cycle parking spaces in the borough	New cycle stands were installed at Beeston Train station and in Eastwood and Beeston Town Centres. Improved stands Kimberley Leisure Centre and Council Offices.	**Complete**
	To have Air Quality as a priority in the Nottinghamshire Joint Health and Wellbeing Strategy and the Nottinghamshire ICS Green Plan [led by the NHS].	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2021	2021	NCC and NHS	N/A	Funded	N/A	Completed	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	Air Quality is now a priority in the 2022 - 2026 Nottinghamshire Joint Health and Wellbeing Strategy and the Nottinghamshire ICS Green Plan [led by the NHS].	**Complete**
	Cycling networks as part of Active Travel Funding (ATF) Tranche 1	Transport Planning and Infrastructure	Cycle Network	2020	2020	NCC	Active Travel Fund (ATF)	Funded	£1m - £10m	Completed	Reduced emissions of N02 and PM	Increased cycling trips	The government set up the Active Travel Fund to support the Gear Change strategy and to provide funding to	**Complete**

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													support local authorities in implementing measures which will benefit walking and cycling. The first tranche of funding was announced in May 2020. NCC secured £0.26m towards the County Council's Emergency Active Travel Fund (Tranche 1) proposals, aimed at delivering quick emergency interventions to make cycling and walking safer.	
	To get the Nottinghamshire Air Quality Strategy endorsed by portfolio holders	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	2020	BBC Public Protection – Environmental Health Officer	N/A	Not Funded	N/A	Completed	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•The NAQS was endorsed by portfolio holders in 2020.	**Complete**
	Joint Strategic Needs Assessment	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2020	NCC/NCiC/Borough and District councils	LA	Funded	N/A	Completed	Reduced Emissions from raising awareness	Raising awareness and reduced emissions	• Air Quality is now a chapter in the Joint Strategic Needs Assessment and part of the health and wellbeing Board considerations. • Reviewed and updated in 2020.	**Complete**
	To contribute to Nottinghamshire Air Quality Strategy (NAQS)	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2020	NCC/NCiC/ Borough and District councils	N/A	Not Funded	N/A	Completed	Reduced Emissions from raising awareness	Improving Air Quality, reduced Emissions and Raising awareness	•Strategy reviewed and rewritten; and the draft was approved at the Nottinghamshire County and City Health & Wellbeing Board in 2019. • The NAQS has been endorsed by portfolio holders and its published online	**Complete** **Complete**
	Nottingham Go-Ultra Low programme - promoting uptake of LEVs	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC and NCC	OLEV funding	Funded	£1 Million-£10 Million	Completed	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	• £6.1m of funding was secured for 2016-2020 through the Go Ultra Low (GUL) programme. • 123 locations in the county have been investigated for the potential provision of EV charge points as part of GUL project, with total of 68 chargers installed across 22 sites in Nottinghamshire between 2019-20. • In Broxtowe, 24 sites were investigated; of which 5 were feasible; providing 1 rapid, 19	**Complete**

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													fast and 1 slow charge points within car parks in four towns within the borough (Beeston, Eastwood, Kimberley and Stapleford). • Promotion events were held for public, businesses and fleet operators including loans of LEVs for trial use in 2018 and 2019.	
	Nottingham Go-Ultra Low programme - promoting uptake of LEVs	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2016	2020	NCiC/NCC	OLEV funding	Funded	£1 Million-£10 Million	Completed	Reduction in pollutants and emissions due to increased use of low emission vehicles.	On-going take-up of cleaner vehicles	• £6.1m funding secured for 2016-2020 through the Go Ultra Low programme. • Promotion events held for public, businesses and fleet operators including loans of LEVs for trial use in 2018 and 2019 • Funding ended in 2021	**Complete**
	Developer requirements to provide of EV charging points at new development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2020	BBC Planning Policy Department – Planning Policy Team Leader	N/A	Not Funded	N/A	Completed	Reduction in NO_2 and PM	Reduced Emissions	Review of the Broxtowe Local plan includes Policy 26 that would require a Travel Plan to be submitted with any planning application for 10 or more dwellings or 1,000 square metres or more floor space. This policy was adopted in September 2019.	**Complete**
	Workplace travel plans	Promoting Travel Alternatives	Workplace Travel Planning	2018	2020	BBC Planning Policy Department – Planning Policy Team Leader and NCC	LA – BBC and NCC	Not Funded	N/A	Completed	0.2µg/m^3	Restrain average journey times in the morning peak to a 1% increase per year	•Broxtowe Part 2 of the Local Plan (2018-2028), which includes Policy 26 on Travel Plans, was adopted in 2019. It is expected in this policy that all planning applications for large development sites (10 or more dwellings or 1,000 squares metres or more gross floo space) must include a travel plan. •BBC and NCC have a travel plan •BBC has undertaken a review of the Councils travel plan and a feasibilit study of having bus card/ Tickets for employee use	**Complete** **Complete** **Complete**
	Planning and Policy Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2019	BBC Planning Policy Department – Planning Policy Team Leader	N/A	Not Funded	N/A	Completed	Reduction in NO_2 and PM	Reduced Emissions	Broxtowe Part 2 of the Local Plan (2018-2028), which includes Policy 20 on Air Quality, was adopted in 2019.	**Complete**

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	Eco-driver training sessions	Vehicle Fleet Efficiency	Driver training and ECO driving aids	2012	2018	NCC	LA –NCC	Not Funded	Within existing resources	Completed	Reduction in $N0_2$ and PM due to improved driving efficiency.	Reduced emissions	Eco-driving training sessions held for NCC staff	**Complete**
	Encouragement of low-emission public transport fleets	Vehicle Fleet Efficiency	Promoting low emission public transport	2017	2017	NCC	NCC/OLEV - Low Emission Bus Scheme	Funded	£100k-£500k	completed	Reduction in $N0_2$ and PM due to increased use of low emission vehicles.	Reduced Emissions and On-going take-up of cleaner vehicles	• NCC secured £527,000 OLEV funding and match funded the scheme with £410,000 from its transport budget. • Introduction of two electric buses serving communities in Beeston and Stapleford.	**Complete**
	Fleet vehicle tracking system	Vehicle Fleet Efficiency	Driver Training and ECO driving aids	2015	2017	BBC Transport and Stores Manager and NCC	LA – BBC and NCC	Not Funded	Within existing resources	Completed	Reduction in $N0_2$ and PM due to improved driving efficiency and efficient routes.	Reduced emissions	•All BBC & NCC fleet vehicles are fitted with a vehicle tracking system, which records vehicle speed and idling time. •measures can be implemented e.g. staff training, to improve fleet efficiency.	**Complete** **Complete**
	Zoning of refuse collections	Vehicle Fleet Efficiency	Other	2016	2017	BBC Transport and Stores Manager	LA - BBC	Not Funded	Within existing resources	Completed	Reduction in $N0_2$ and Particulate Matter as there is one less fleet vehicle used.	Reduced emissions	•A review of the refuse collection areas	**Complete** The Refuse round restructure is now complete, and we have reduced the fleet size by one vehicle.

KEY: **BBC** =Broxtowe Borough Council, **DCC**= Derbyshire County Council; **DCiC**= Derby City Council; **EMCCA** = East Midlands Combined County Authority **NCC**= Nottinghamshire County Council, **NH** = National Highways, **NCiC**= Nottingham City Council, **DfT** = Department for Transport.

= Three Key Measures

= Measures that were completed in 2025

= Measures that were completed between 2017 - 2024

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[2], local authorities are expected to work towards reducing emissions and/or concentrations of fine particulate matter ($PM_{2.5}$). There is clear evidence that $PM_{2.5}$ (particulate matter smaller 2.5 micrometres) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

BBC purchased a Zephyr real time sensor in late 2021, which was installed in 2022 to monitor PM_{10}, $PM_{2.5}$ and NO_2 in the (now revoked) Trowell AQMA. There were a variety of issues with the sensor throughout 2025, and after the sensor was replaced, these issues were resolved.

In 2025 the two methods used to determine the levels of $PM_{2.5}$ in the borough are the results obtained from the Zephyr real time sensor, and to report on the modelled background levels for the borough provided by Defra. The modelled background level provided by Defra for the Borough of Broxtowe are modelled to be between 6.5µg/m^3 and 7.9µg/m^3 for 2025, with the annual mean for 2025 being 7.1µg/m^3.

The $PM_{2.5}$ annual mean concentrations obtained from the Zephyr real time sensor for 2025 was 9.5µg/m^3. However, as mentioned previously there were major issues with the Zephyr in 2025, and the data capture was 39.0% which is less than the 75% requirement Therefore, although the $PM_{2.5}$ air quality objective of 20µg/m^3 was not exceeded, the data cannot be used.

The Air Quality Objective (AQO) for $PM_{2.5}$ is an annual mean of 20µg/m^3. However, the World Health Organisation guideline value, which are more stringent for $PM_{2.5,}$ give a

[2] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

guideline of 10µg/m^3 for $PM_{2.5}$. Therefore, the modelling results provided by Defra, show that the borough are also meeting the current WHO guidelines.

As well as reviewing the Zephyr data and the modelled background data for $PM_{2.5}$, it is also important to review the Public Health Outcomes Framework (PHOF), which is published by the Office for Health Improvement & Disparities and reviewed every three years. PHOF enables local authorities to identify the local indicator for $PM_{2.5}$ in their district, to compare the 'Fraction of mortality attributable to particulate air pollution indicator' value and to compare this to nearby local authorities.

Table 2.2 below provides the estimated effects of annual mortality in 2024 of human-made $PM_{2.5}$ air pollution for East Midlands, Nottinghamshire, Nottingham City and Broxtowe Borough Council. The figures show that within the Borough of Broxtowe there are modelled to be 67 deaths attributable to human-made air pollution.

Table 2.2 – Estimated Effects of Annual Mortality in 2024 of human-made $PM_{2.5}$ Air Pollution.

Council/Area	Attributable fraction	Attributable deaths aged 30+* (2023 deaths ONS)	Associated Life-years Lost due to PM based on 29,000 nationally (COMEAP 2010)
East Midlands	5.4	2700	21,393
Nottinghamshire	5.4	484	4,374
Nottingham City	5.7	141	1,240
Broxtowe Borough	5.5	67	612

Source: Estimating Local Mortality Burdens associated with particulate air pollution, Office for Health Improvement & Disparities, 2024.

*Air pollution is likely to contribute a small amount to the deaths of a larger number of exposed individuals rather than being solely responsible for the number of deaths equivalent to the calculated figure of attributable deaths.

Research has shown that there is significant harm to health at concentrations of Particulate Matter well below the current EU and UK limit values. Therefore, BBC is taking the following measures to address $PM_{2.5}$:

- Ensuring that dust management plans are requested during the planning application stage for all sites that involve large scale demolition and building works.
- To ensure that best practicable means of dust control measures are being used regardless of how large the development is. These measures can include the use of bowsers, road sweepers and dust suppression to prevent 'trackout'. Also minimise dust generating activities on dry windy days, and if there are stockpiles ensure they are covered to prevent wind-whipping.
- Ensuring that developers are carrying out dust suppression monitoring on site at large development sites.
- Ensuring that water suppressants are in use when Nibblers and mobile crushers are on site.
- Educating the public in matters that contribute to air quality e.g. not having bonfires.
- Educate and advise the public about using exempt appliances with the correct fuel for that appliance in BBCs smoke control area.
- Enforcing the Clean Air Act 1993 and the Environmental Protection Act 1990 where necessary to minimise the risk of particulates becoming air borne.
- To continue to manage, advice and enforce the Pollution Prevention and Control Regulations 1999 and the Environmental Permitting (England and Wales) Regulations 2010 (Amended in 2013) on permitted processes when necessary.
- To encourage, support and promote sustainable travel within the Borough by working with a variety of organisations and neighbouring local authorities.
- To continue to promote green travel e.g. walking, cycling, low emissions/ electric vehicles and the tram network.
- To continue to support bus companies and taxis that operate within the Borough to reduce emissions.
- To continue to review suitable research methods for reducing air quality levels for particulate matter e.g. the use of vegetation.

- Promote and encourage the use of the final version of the “EMAQN Air Quality and Emissions Mitigation: guidance for developers” document.
- To inspect Crushers that are used within the borough on demolition sites when notifications are received, to ensure compliance with the process permit, and good housekeeping so that dust levels are reduced.
- To communicate with all allotment providers in the borough, to discourage the use of bonfires to dispose of green waste.
- To educate the public that electric motor vehicles whilst being positive for reducing NO_2 and CO_2, will still emit Particulate Matter and therefore active travel is still recommended as an alternative.
- Broxtowe Borough Council also formally adopted a Smoke Control Order Enforcement Policy in October 2023 to enable improved future regulation of the issue.

2.3.1 Smoke Control Areas

In 2023 Broxtowe Borough Council completed a public consultation on revoking its current Twenty-one Smoke Controls Orders which date back to the 1960’s and replacing them with a single borough wide Smoke Control Order.

As part of the public consultation BBC were able to obtain the following information on what the public thought to the proposals. Eighty two percent of the public support the Council to control the pollutants in the air. Fifty six percent felt that air quality is very important, sixty seven percent of people would support the introduction of a single smoke control order to prevent smoke being emitted from chimneys unless they are using authorised fuels/log burners.

The new Order to replace all the current smoke control orders was sealed in December 2024, which came into force in June 2025. Broxtowe Borough Council has also formally adopted a Smoke Control Order Enforcement Policy in October 2023 to support enforcement of its Order and enable improved future regulation of the issue.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

This section sets out the monitoring undertaken within 2025 by Broxtowe Borough Council, and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2021 and 2025 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Low-Cost Air Quality Sensor Monitoring Site

BBC installed a low-cost air quality sensor Zephyr monitor on Iona Drive, Trowell next to the M1 Motorway. The Zephyr provides useful indicative data, but at present it is not recognised by Defra or approved for use in statutory LAQM reporting. Table C.3 shows the details of the Zephyr monitoring site, and Table C.4 in Appendix C shows the monitoring results from the Zephyr.

There were significant problems with the real time sensor in 2025 and as a result the data capture was 39% which is less than the 75% requirement. The Issues have now been resolved. Maps showing the location of the monitoring site are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Broxtowe Borough Council undertook non-automatic (i.e. passive) monitoring of NO_2 using 41 diffusion tubes during 2025 at 38 sites. Table A.1.1 in Appendix A presents the details of the non-automatic sites. The 2025 monitoring network stayed the same as the previous year.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. annualisation and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

The full 2025 dataset of monthly mean values for the diffusion tubes is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant. All the tubes were deployed in line with the Defra Calendar.

Broxtowe Borough Council purchased a Zephyr Monitor. The Zephyr provides useful indicative data, but Defra do not recognise this type of low-cost air quality sensor for use in statutory LAQM reporting. However, see Appendix C for results from the Zephyr Monitor.

As well as discussing the results from the recently revoked AQMA in Trowell, which was revoked in January 2024. The following chapter will discuss the results and trends for all the monitoting sites within 2025.

Revoked AQMA in Trowell

There are five diffusion tube sites located within Tiree Close and Iona Close in Trowell that are located within the recently revoked Trowell AQMA. The results below show that since 2016 the levels of NO_2 are consistently below the objective of 40µg/m^3 for all sites. A co-location study of triplicate tubes (Site ID 61, 62 and 63) were also sited next to the Zephyr the annual data is provided for site 63 only.

The 2025 data shown in Table 3.1 shows that the levels in 2025 are less than they were in 2024 at all of the sites within the revoked AQMA.

Table 3.1 – Results for the Revoked AQMA in Trowell 2016 – 2025.

Site ID	NO_2 Annual Mean Concentration (µg/m^3)									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
18	34.3	32.9	28.2	28.4	17.9	22.3	21.5	19.6	18.9	17.7
19	37.6	37.2	31.9	30.9	22.9	23.8	22.3	20.9	20.6	18.7
58	-	-	-	-	24.8	27.6	20.7	18.4	17.2	17.1
59	-	-	-	-	20.1	20.8	20.3	18.2	17.4	16.9
61, 62 &63	-	-	-	-	-	-	21.7	19.4	18.7	18.5

The Results and Trends for all Monitoring Sites in 2025.

Defra requested that trend charts were provided for all monitoring sites to identify any trends in the annual mean concentrations. The trend charts are displayed in Figure A.1 in the Appendices for all the sites in use since 2021 to 2025.

Out of the thirty-eight sites that are identified in the trend charts in Figure A.1 in the Appendices, seventeen are showing a consistent downward trend year on year. Four sites are showing an overall downward trend. Two sites showed the same result for the 2025 data as the 2024 data, and fifteen sites have shown a slight increase in the 2025 data in comparison to the 2024 data.

Seventeen of the thirty-eight sites are showing a consistent downward trend year on year, these sites are Site 2, site 11, site 12, site 45, site 16, site 54, site 18, site 58, site 59, site 19, site 61/62/63, site 30, site 31, site 33/34, site 35, site 36 and site 37.

Four of the thirty-eight sites are showing an overall downward trend of the data these sites are, site 5, site 7, site 27 and site 43.

Two of the thirty-eight sites showed the same result for the 2025 data as the 2024 data; these sites are site 4 and site 56.

The remaining fifteen of the thirty-eight sites (site 1, site 52, site 60, site 8, site 15, site 17, site 20, site 22, site 44, site 32, site 38, site 39, site 40, site 41 and site 48) have showed an increase in the 2025 data in comparison to the 2024 data (2020 excluded as an anomaly). It is believed that the slight increase in concentrations is due to an increase in people returning to work and the bias correction factor is higher than previous years. The slight increase is shown in other Nottinghamshire local authorities 2025 data. The four sites that have shown an increase between 2.0µg/m^3 and 2.5µg/m^3 for the 2025 data in comparison to the 2024 data will be discussed in greater detail below.

Site 60 – Dovecote Lane Park, Beeston

Table 3.2 below shows the results for Dovecote Lane Park in Beeston for 2021 to 2025. This site was brought into commission in 2022, therefore there is not data for 2021. The data shows that the highest concentration was in 2022 at 16.8µg/m^3 and the data had shown a downward trend until 2025, when there was an increase of 2.1µg/m^3 between 2024 and 2025. The reason for the increase may be due to road works and diversions in Beeston, and people taking this route to avoid delays.

Table 3.2 – Results for Dovecote Lane Park, Beeston 2021 – 2025.

NO_2 Annual Mean Concentration (µg/m^3)					
Site ID	**2021**	**2022**	**2023**	**2024**	**2025**
60	-	16.8	15.8	13.9	16.0

It must be noted that this site has never exceeded the Air Quality Objective (AQO) of 40µg/m^3 for NO_2, and the 2025 concentration is 24.0µg/m^3 below the AQO. Although the data is below the air quality objective of 40µg/m^3, this site will continue to be monitored.

Site 44 - Parking Sign outside 32 Mansfield Road, Eastwood

Table 3.3 below shows the results at the Parking Sign outside 32 Mansfield Road for 2021 to 2025, the data shows that the highest concentration was in 2021 at 27.6µg/m^3 and the data had shown a downward trend until 2025, when there was an increase of 2.1µg/m^3

between 2024 and 2025. The reason for the increase may be due to road works and resurfacing works in Eastwood, resulting in lane restrictions and queuing traffic.

Table 3.3 – Results for Parking Sign Outside 32 Mansfield Road, Eastwood 2021 – 2025.

NO_2 Annual Mean Concentration (µg/m^3)					
Site ID	2021	2022	2023	2024	2025
44	27.6	26.9	24.9	23.8	25.9

It must be noted that this site has never exceeded the Air Quality Objective (AQO) of 40µg/m^3 for NO_2, and the 2025 concentration is 14.1µg/m^3 below the AQO. Although the data is below the air quality objective of 40µg/m^3, this site will continue to be monitored.

Site 32 - "D for Dogs" 59b Main Street, Kimberley

Table 3.4 below shows the results for "D for Dogs" 59b Main Street in Kimberley for 2021 to 2025, the data shows that the highest concentration was in 2021 at 22.9µg/m^3 and the data had shown a downward trend until 2025, when there was an increase of 2.5µg/m^3 between 2024 and 2025. The reason for the increase is that there were gas pipe replacement works being undertaken in the middle of Kimberley. There were lane closures and single file traffic. This took several months to be completed.

Table 3.4 – Results for "D for Dogs" 59b Main Street, Kimberley 2021 – 2025.

NO_2 Annual Mean Concentration (µg/m^3)					
Site ID	2021	2022	2023	2024	2025
32	22.9	20.9	19.6	16.8	19.3

It must be noted that this site has never exceeded the Air Quality Objective (AQO) of 40µg/m^3 for NO_2, and the 2025 concentration is 20.7µg/m^3 below the AQO. Although the data is below the air quality objective of 40µg/m^3, this site will continue to be monitored.

Site 38 – Opposite the Sherwin Arms Pub, Derby Road, Bramcote

Table 3.5 below shows the results for opposite the Sherwin Arms Pub, Derby Road in Bramcote for 2021 to 2025, the data shows that the highest concentration was in 2021 at 24.1µg/m^3 and the data had shown a downward trend until 2025, when there was an increase of 2.0µg/m^3 between 2024 and 2025. The reason for the increase may be due to road works and diversions in Stapleford and Bramcote, which resulted in stationary traffic.

Table 3.5 – Results for opposite the Sherwin Arms Pub, Derby Road, Bramcote 2021 – 2025.

NO_2 Annual Mean Concentration (µg/m^3)					
Site ID	2021	2022	2023	2024	2025
38	24.1	22.0	21.7	19.0	21.0

It must be noted that this site has never exceeded the Air Quality Objective (AQO) of 40µg/m^3 for NO_2, and the 2025 concentration is 19.0µg/m^3 below the AQO. Although the data is below the air quality objective of 40µg/m^3, this site will continue to be monitored.

3.2.2 Particulate Matter (PM_{10})

Broxtowe Borough Council purchased a Zephyr Monitor. The Zephyr provides useful indicative data, but Defra do not recognise this type of low-cost air quality sensor for use in statutory LAQM reporting. See Appendix C for results from the Zephyr Monitor.

3.2.3 Particulate Matter ($PM_{2.5}$)

Broxtowe Borough Council purchased a Zephyr Monitor. The Zephyr provides useful indicative data, but Defra do not recognise this type of low-cost air quality sensor for use in statutory LAQM reporting. See Appendix C for results from the Zephyr Monitor.

3.2.4 Sulphur Dioxide (SO_2)

Previous air quality reports have shown there are no relevant sources of Sulphur Dioxide within the borough. Subsequently, the Council does not monitor for this pollutant.

Appendix A: Monitoring Results

A.1 Diffusion Tube Monitoring Results

Table A.1.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	113 Wollaton Rd, Beeston	Roadside	452527	337313	NO_2	No	0	2	N	1.9
2	166 Derby Rd, Beeston	Roadside	452091	338122	NO_2	No	0	9	N	1.8
4	226 Queens Rd, Beeston	Roadside	453361	336627	NO_2	No	0	5	N	1.8
52	228 Station Rd Beeston	Roadside	453287	336349	NO_2	No	0	5	N	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
60	Dovecote Lane Park, Beeston	Roadside	453075	336311	NO_2	No	0	9	N	1.9
5	Chilwell Olympia School, Beeston	Urban Background	451782	335320	NO_2	No	0	104	N	1.9
7	31 Hickton Drive, Chilwell	Roadside	450756	334328	NO_2	No	0	6	N	1.9
8	The Manor Pub, 350 Nottingham Rd, Toton	Roadside	450422	334243	NO_2	No	0	5	N	1.8
11	269 Stapleford Lane, Toton	Roadside	449694	335501	NO_2	No	0	10	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
12	Lamppost, Stapleford Lane, Toton	Roadside	449615	335664	NO_2	No	0	1	N	1.9
45	209 Toton Lane, Stapleford	Roadside	449467	336220	NO_2	No	0	15	N	1.8
15	George Spencer Academy, Stapleford	Roadside	449406	336135	NO_2	No	0	4	N	1.9
16	24 Brampton Drive, Stapleford	Roadside	449516	336216	NO_2	No	0	7	N	1.7
54	195 Derby Rd, Stapleford	Roadside	448467	336591	NO_2	No	0	4	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
17	Lamppost Church St, Stapleford	Roadside	448890	337190	NO_2	No	0	3	N	1.8
18	20 Tiree Cl, Trowell	Roadside	448560	338889	NO_2	No	0	9*	N	1.7
58	10 Tiree Cl, Trowell	Roadside	448588	338940	NO_2	No	0	11*	N	1.7
59	4 Tiree Cl, Trowell	Roadside	448602	338965	NO_2	No	0	9*	N	1.7
19	15 Iona Drive, Trowell	Roadside	448586	339023	NO_2	No	0	18*	N	1.9
61, 62 and 63	Street Column Iona Drive, Trowell ^	Roadside	448607	339026	NO_2	No	1	2*	Y	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
20	30 Derbyshire Ave, Trowell	Roadside	448652	339652	NO_2	No	0	12*	N	1.9
22	81 Nottingham Rd, Trowell	Roadside	448832	340098	NO_2	No	0	18*	N	1.8
44	32 Mansfield Rd, Eastwood	Roadside	446509	347091	NO_2	No	0	2	N	1.8
27	Sun Inn Pub, 6 Derby Rd, Eastwood	Roadside	446465	346985	NO_2	No	0	8	N	1.8
30	560 Nottingham Rd, Giltbrook	Roadside	448544	345241	NO_2	No	0	4	N	1.9
31	15 Hayley Cl, Kimberley	Roadside	448826	344883	NO_2	No	0	7	N	1.9

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
32	59b Main St, Kimberley	Roadside	450122	344658	NO_2	No	0	5	N	1.8
33 and 34	19a Nottingham Rd, Nuthall^	Roadside	451631	344526	NO_2	No	0	11*	N	1.7
35	20 Nottingham Rd, Nuthall	Roadside	451728	344440	NO_2	No	0	20*	N	1.9
36	113 Nottingham Rd, Nuthall	Roadside	452232	344033	NO_2	No	0	20	N	1.7
37	114 Nottingham Rd, Nuthall	Roadside	452331	343910	NO_2	No	0	27	N	1.7

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
38	Opp Sherwin Arms, Derby Rd, Bramcote	Roadside	450389	337866	NO_2	No	2	2	N	1.8
39	9 Bembridge Court, Bramcote	Roadside	450434	337781	NO_2	No	0	14	N	1.6
56	10 Town St, Bramcote	Roadside	450570	337851	NO_2	No	0	9	N	1.9
40	153 Derby Rd, Bramcote	Roadside	450632	337929	NO_2	No	0	13	N	1.7
41	169 Derby Rd, Bramcote	Roadside	450555	337909	NO_2	No	0	10	N	1.8
48	Near 73 Town St, Bramcote	Roadside	450817	337592	NO_2	No	0	2	N	1.8

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
43	Broxtowe Borough Council Offices	Urban Background	452733	336962	NO_2	No	0	8	N	1.8

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

(*) All distance to kerb of nearest road but sites near to the M1 Motorway.

(^) Duplicate/Triplicate Diffusion Tubes.

Table A.1.2 – Annual Mean NO2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2025 (%) (2)	2021	2022	2023	2024	2025
1	452527	337313	Roadside	100.0	100.0	21.0	20.8	18.7	19.3	19.6
2	452091	338122	Roadside	100.0	100.0	20.8	20.1	18.5	18.3	17.2
4	453361	336627	Roadside	100.0	100.0	20.2	19.2	17.2	17.4	17.4
52	453287	336349	Roadside	100.0	100.0	19.0	17.5	16.8	15.8	15.9
60	453075	336311	Roadside	90.4	90.4	-	16.8	15.8	13.9	16.0
5	451782	335320	Urban Background	100.0	100.0	13.5	13.2	11.9	12.4	11.4
7	450756	334328	Roadside	100.0	100.0	18.0	16.5	17.3	16.2	15.8
8	450422	334243	Roadside	100.0	100.0	22.4	21.1	20.1	18.2	19.8
11	449694	335501	Roadside	100.0	100.0	23.0	22.5	21.2	19.5	19.4

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2025 (%) (2)	2021	2022	2023	2024	2025
12	449615	335664	Roadside	100.0	100.0	19.1	18.9	17.3	16.4	16.1
45	449467	336220	Roadside	100.0	100.0	20.8	20.6	19.4	19.4	18.7
15	449406	336135	Roadside	100.0	100.0	25.2	28.3	25.6	23.5	24.2
16	449516	336216	Roadside	100.0	100.0	20.0	19.8	18.1	17.9	17.4
54	448467	336591	Roadside	100.0	100.0	23.6	22.0	20.5	19.6	19.5
17	448890	337190	Roadside	100.0	100.0	26.7	26.3	24.3	21.9	22.9
18	448560	338889	Roadside	100.0	100.0	22.3	21.5	19.6	18.9	17.7
58	448588	338940	Roadside	100.0	100.0	21.8	20.7	18.4	17.2	17.1
59	448602	338965	Roadside	100.0	100.0	21.0	20.3	18.2	17.4	16.9
19	448586	339023	Roadside	100.0	100.0	23.8	22.3	20.9	20.6	18.7

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2025 (%) [2]	2021	2022	2023	2024	2025
61, 62 and 63	448607	339026	Roadside	100.0	100.0	-	21.7	19.4	18.7	18.5
20	448652	339652	Roadside	100.0	100.0	19.7	18.7	17.4	16.5	18.1
22	448832	340098	Roadside	100.0	100.0	19.7	19.8	17.7	16.2	18.0
44	446509	347091	Roadside	100.0	100.0	27.6	26.9	24.9	23.8	25.9
27	446465	346985	Roadside	100.0	100.0	18.9	18.0	18.2	17.4	16.4
30	448544	345241	Roadside	100.0	100.0	20.3	19.1	18.4	17.9	17.2
31	448826	344883	Roadside	100.0	100.0	22.8	21.7	20.9	20.1	18.7
32	450122	344658	Roadside	92.3	92.3	22.9	20.9	19.6	16.8	19.3
33 and 34	451631	344526	Roadside	100.0	100.0	20.7	19.6	17.9	17.2	17.0

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2025 (%) [2]	2021	2022	2023	2024	2025
35	451728	344440	Roadside	100.0	100.0	23.4	22.9	19.9	19.6	19.3
36	452232	344033	Roadside	100.0	100.0	26.0	25.4	23.4	22.6	21.9
37	452331	343910	Roadside	100.0	100.0	23.5	21.1	19.7	19.7	19.3
38	450389	337866	Roadside	100.0	100.0	24.1	22.0	21.7	19.0	21.0
39	450434	337781	Roadside	100.0	100.0	21.1	20.5	18.6	17.9	18.5
56	450570	337851	Roadside	100.0	100.0	19.6	19.8	18.1	16.9	16.9
40	450632	337929	Roadside	90.4	90.4	27.4	25.8	24.0	21.9	22.6
41	450555	337909	Roadside	100.0	100.0	26.0	25.3	23.5	21.6	21.8
48	450817	337592	Roadside	100.0	100.0	27.8	28.4	26.6	23.7	24.2
43	452733	336962	Urban Background	100.0	100.0	14.9	14.2	12.2	12.4	11.4

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes: The annual mean concentrations are presented as µg/m^3.

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

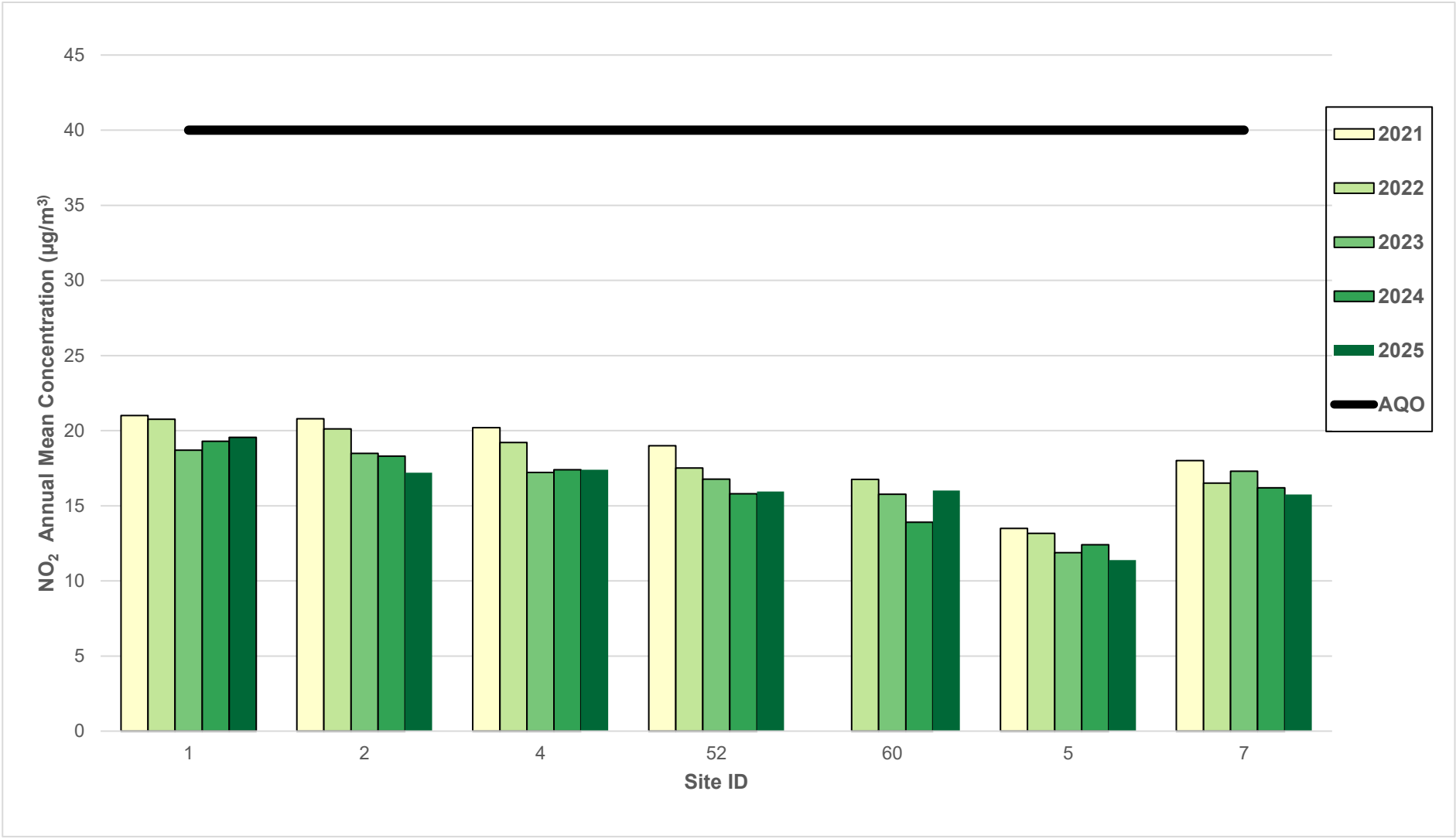
Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

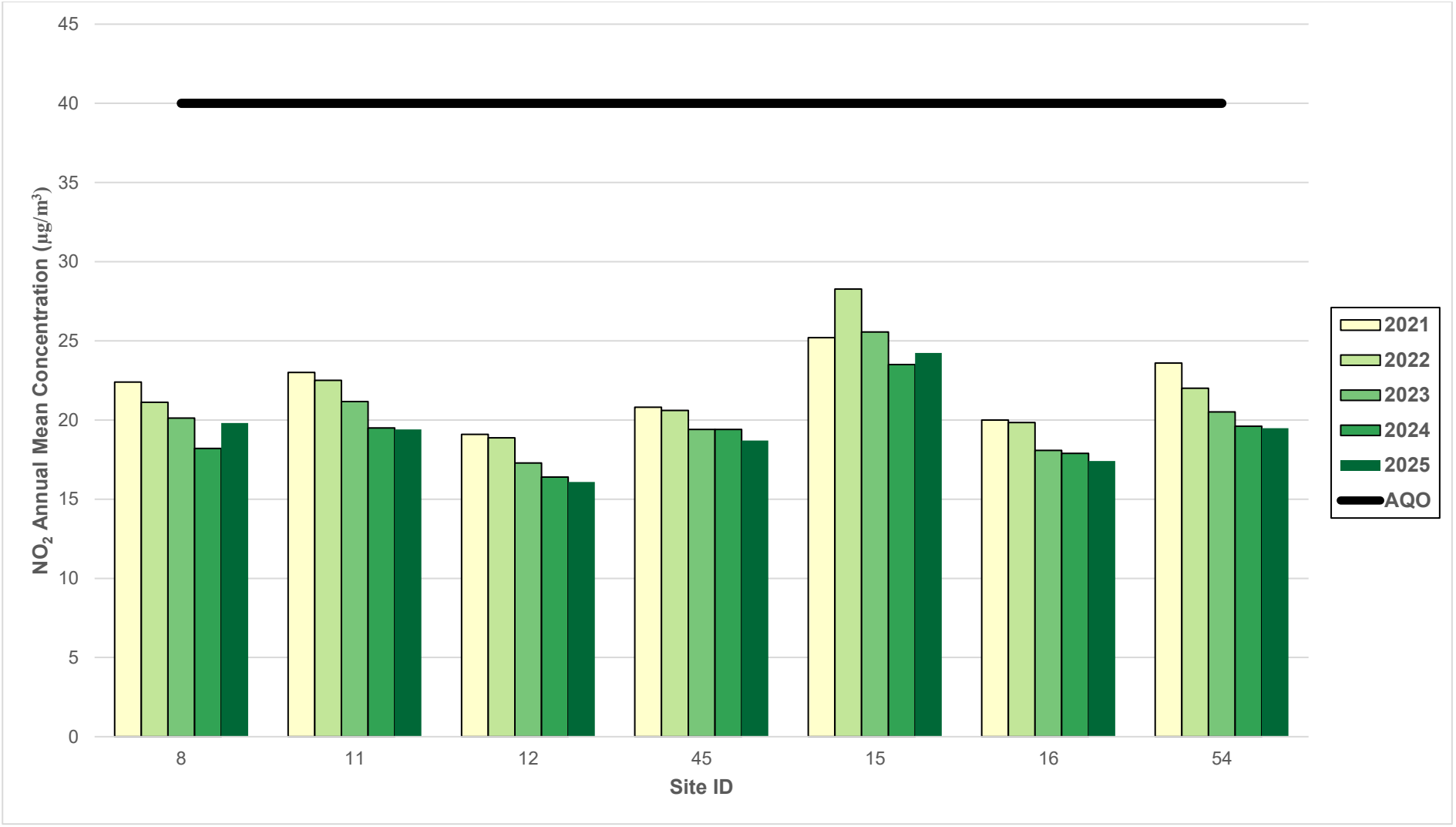
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

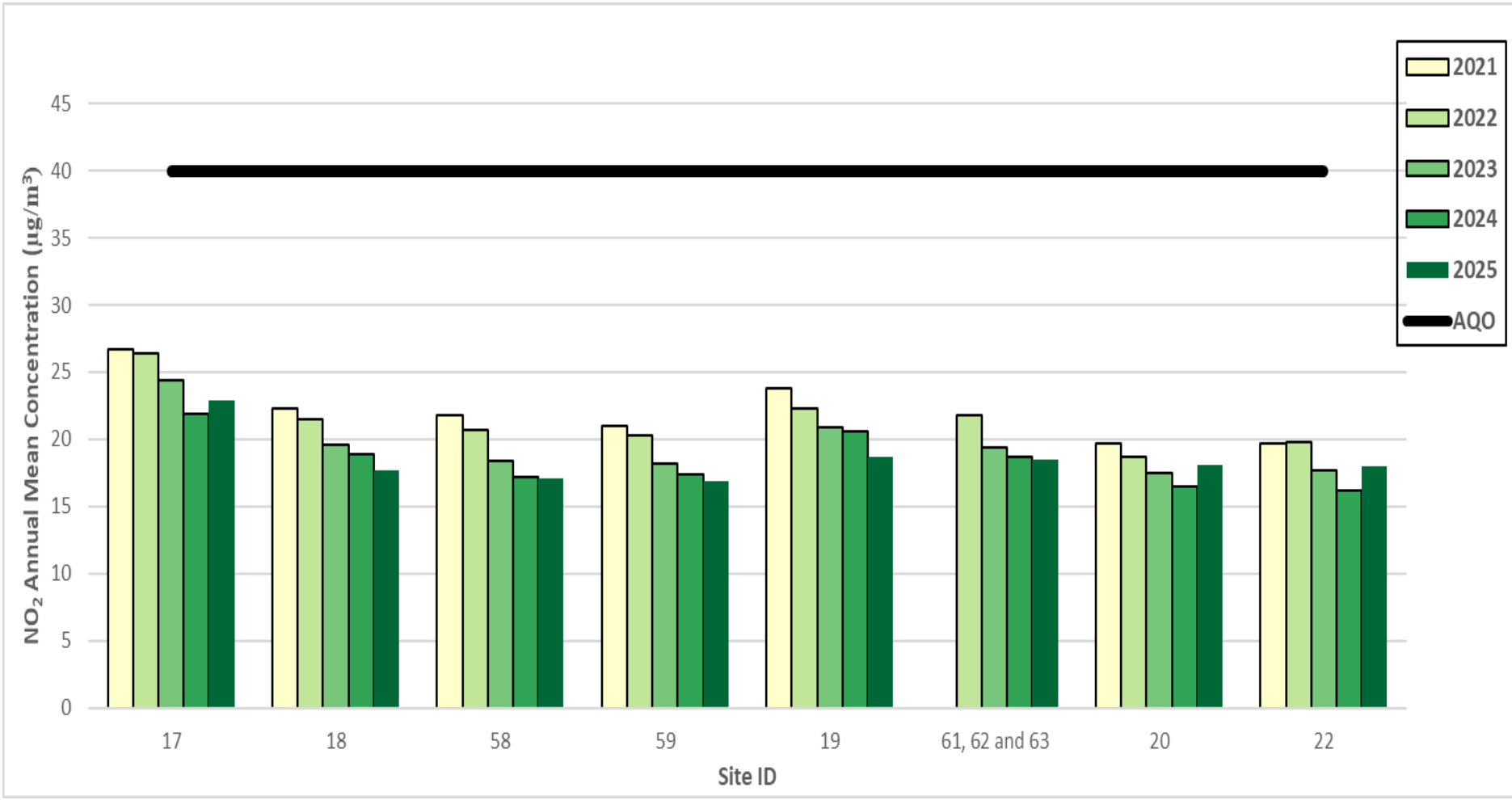
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

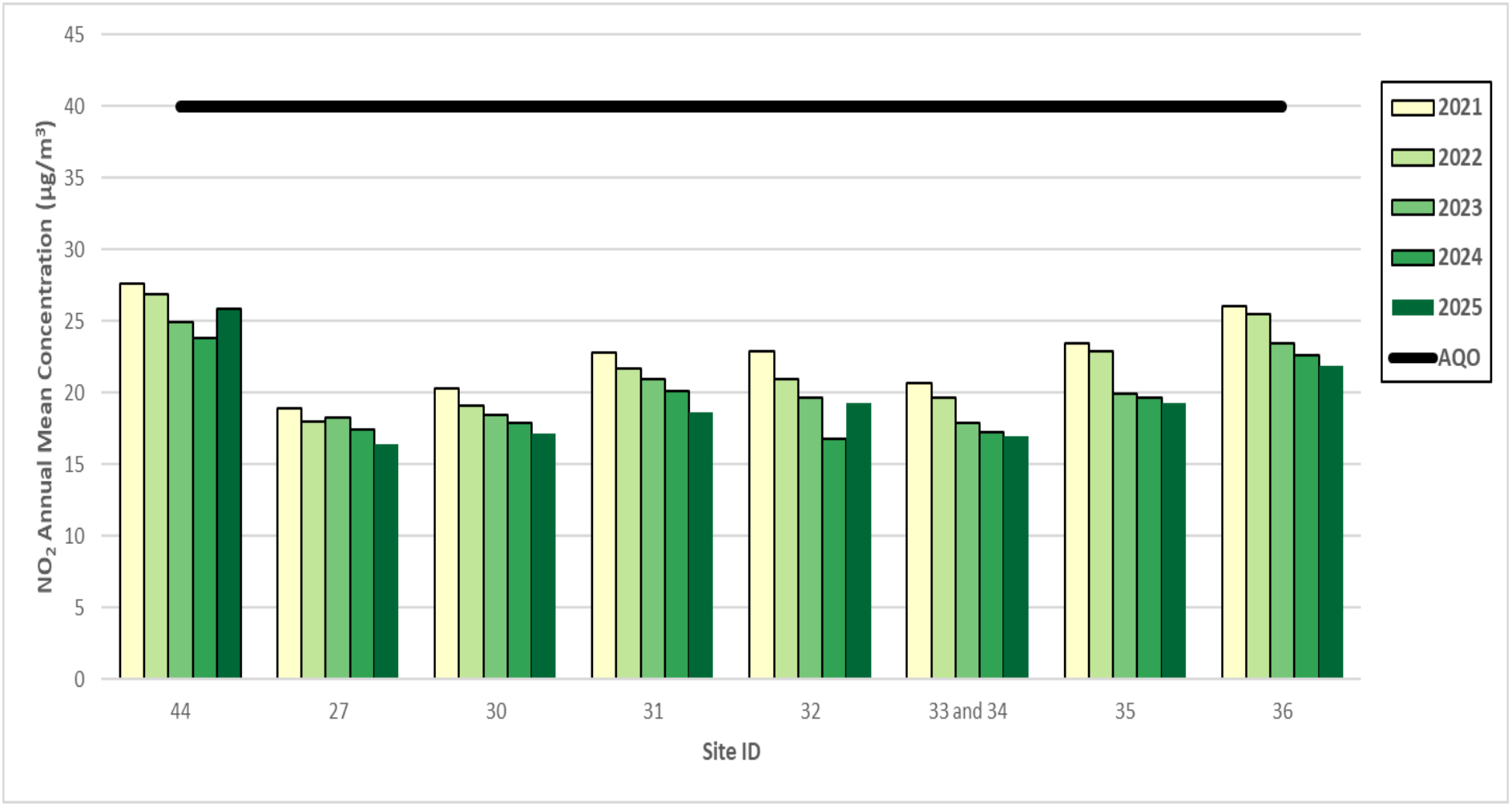
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

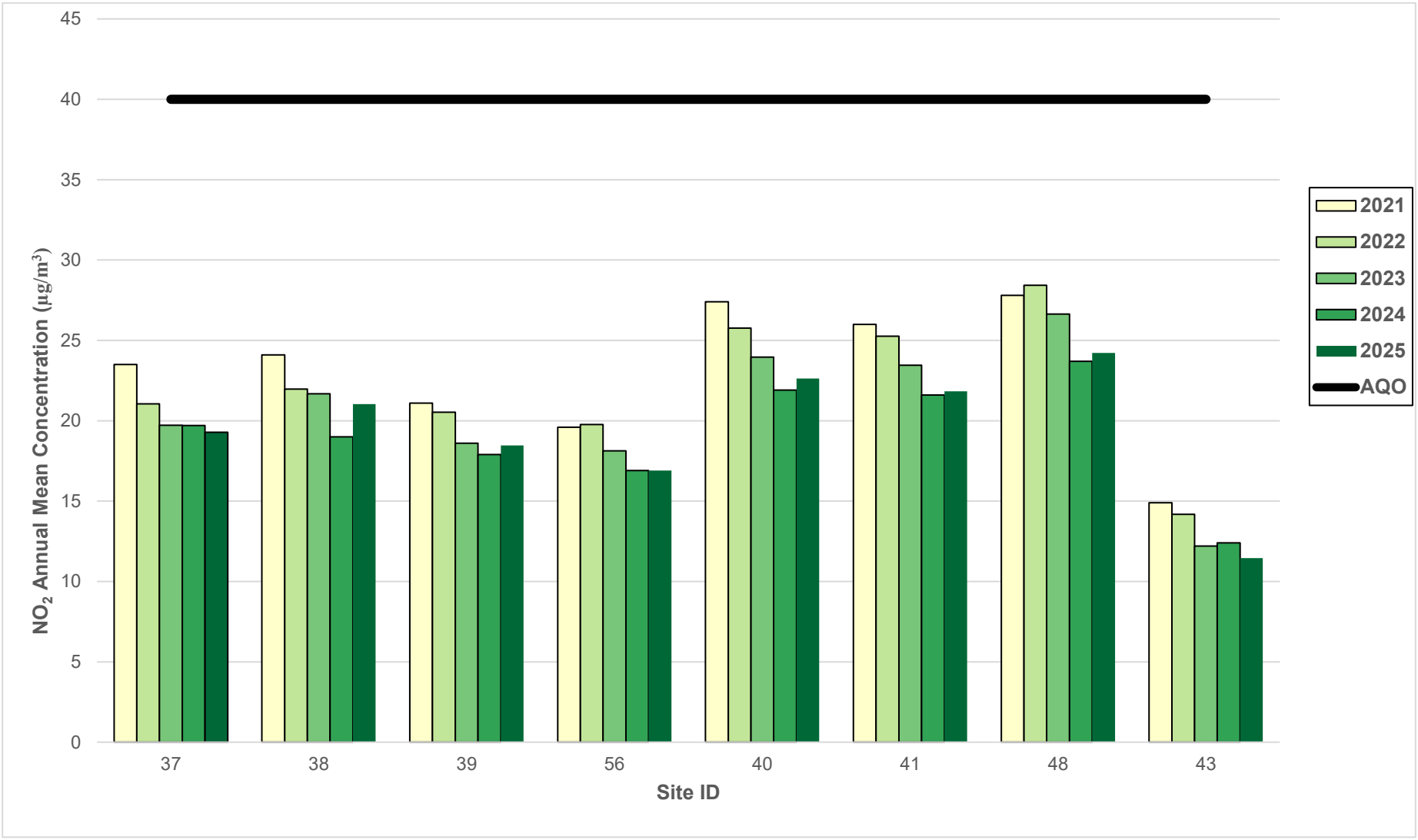
Figure A.1 – Trends in Annual Mean NO_2 Concentrations




45
40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
8
11
12
45
15
16
54
Site ID
2021
2022
2023
2024
2025
AQO


2021
2022
2023
2024
2025
AQO
45
40
35
30
25
20
15
10
5
0
NO_2 Annual Mean Concentration (µg/m³)
17
18
58
59
19
61, 62 and 63
20
22
Site ID


45
40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
2021
2022
2023
2024
2025
AQO
44
27
30
31
32
33 and 34
35
36
Site ID


45
40
35
30
25
20
15
10
5
0
NO2 Annual Mean Concentration (µg/m3)
37
38
39
56
40
41
48
43
Site ID
2021
2022
2023
2024
2025
AQO

Appendix B: Full Monthly Diffusion Tube Results for 2025

Table B.1 – NO_2 2025 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.89)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	452527	337313	32.4	28.6	23.5	17.1	15.1	18.8	18.1	18.7	20.4	22.0	25.3	23.7	22.0	19.6		
2	452091	338122	29.3	25.8	20.7	17.7	15.0	14.7	13.0	16.2	18.5	19.4	20.9	20.8	19.3	17.2		
4	453361	336627	27.8	25.1	23.4	17.6	14.2	14.0	12.7	16.7	19.6	18.3	22.4	22.6	19.5	17.4		
52	453287	336349	27.8	24.8	21.3	16.3	12.7	10.2	11.0	14.5	16.8	16.2	20.7	22.7	17.9	15.9		
60	453075	336311	23.3	24.5	23.7	17.9	13.3	10.1		14.0	17.1	15.4	18.2	20.4	18.0	16.0		
5	451782	335320	22.7	17.8	16.5	9.0	8.4	7.7	8.1	9.0	12.0	12.9	16.3	13.4	12.8	11.4		
7	450756	334328	24.1	25.3	20.4	12.4	11.9	13.3	12.1	13.1	17.4	17.7	21.9	22.6	17.7	15.8		
8	450422	334243	30.3	28.5	26.2	22.3	18.5	18.0	15.6	20.3	21.6	20.3	20.8	24.5	22.3	19.8		
11	449694	335501	30.2	27.3	22.6	19.0	17.9	19.3	17.1	19.5	20.1	21.8	22.7	24.0	21.8	19.4		
12	449615	335664	26.9	23.9	23.8	15.6	14.6	11.2	12.8	14.2	16.9	18.1	18.8	20.2	18.1	16.1		
45	449467	336220	32.2	27.1	21.8	20.1	16.4	15.2	13.6	17.4	22.0	20.7	21.9	23.8	21.0	18.7		
15	449406	336135	39.9	31.9	25.2	31.1	20.4	23.5	16.1	24.4	27.8	27.0	29.7	29.7	27.2	24.2		
16	449516	336216	28.9	26.6	24.2	16.1	14.1	13.9	12.3	16.7	18.2	19.9	22.0	21.9	19.6	17.4		
54	448467	336591	32.0	25.6	26.1	21.1	18.1	16.1	14.9	18.5	21.8	20.9	24.6	23.0	21.9	19.5		
17	448890	337190	33.9	31.2	26.7	21.6	18.8	20.1	21.2	22.1	27.3	25.2	31.8	28.8	25.7	22.9		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.89)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
18	448560	338889	28.4	23.0	21.8	12.7	18.0	18.2	20.8	18.1	19.1	21.3	17.2	20.2	19.9	17.7		
58	448588	338940	27.2	21.4	21.1	13.9	15.5	15.7	17.7	16.7	19.1	19.5	21.3	21.1	19.2	17.1		
59	448602	338965	28.2	21.3	20.6	14.0	16.6	15.2	15.8	16.3	19.6	19.1	22.3	19.2	19.0	16.9		
19	448586	339023	28.2	23.4	22.3	14.7	17.1	19.8	20.8	18.7	21.0	21.6	23.5	21.4	21.0	18.7		
61	448607	339026	31.8	24.4	23.4	15.1		15.1	16.9	16.9	21.5	20.8	25.6	22.0	-	-		Triplicate Site with 61, 62 and 63 - Annual data provided for 63 only
62	448607	339026	30.3	24.0	23.1	17.4	13.9	16.4	16.6	17.2	20.9	21.0	24.6	20.7	-	-		Triplicate Site with 61, 62 and 63 - Annual data provided for 63 only
63	448607	339026	33.3	24.5	25.2	14.7	14.7	16.4	16.7	16.6	21.1	21.4	24.2	24.1	20.7	18.5		Triplicate Site with 61, 62 and 63 - Annual data provided for 63 only
20	448652	339652	25.2	28.5	24.9	21.9	16.5	13.0	12.2	19.5	19.3	17.9	21.9	22.7	20.3	18.1		
22	448832	340098	28.1	26.7	21.9	21.1	14.7	16.1	11.8	20.7	21.3	20.8	20.4	19.2	20.2	18.0		
44	446509	347091	36.5	35.6	32.6	32.5	25.2	22.9	21.8	26.8	27.3	27.1	29.8	31.0	29.1	25.9		
27	446465	346985	27.7	22.4	25.4	17.4	15.3	12.3	14.1	14.7	16.8	16.6	20.9	17.6	18.4	16.4		
30	448544	345241	29.5	25.2	19.9	14.4	13.4	14.6	14.3	15.1	20.1	19.5	20.9	24.5	19.3	17.2		
31	448826	344883	31.1	23.9	21.1	16.8	14.4	17.5	17.1	20.7	20.7	22.1	22.9	23.5	21.0	18.7		
32	450122	344658	30.2	27.2	25.3		19.5	15.7	16.8	19.5	20.9	20.4	22.0	20.7	21.6	19.3		
33	451631	344526	28.9	24.6	19.0	18.2	14.5	14.4	11.3	17.6	21.1	20.0	22.7	21.8	-	-		Duplicate Site with 33 and 34 - Annual data provided for 34 only
34	451631	344526	29.2	22.8	20.2	15.7	13.0	12.4	11.9	18.7	19.3	18.9	22.1	20.6	19.1	17.0		Duplicate Site with 33 and 34 - Annual data provided for 34 only
35	451728	344440	30.7	23.1	19.9	14.4	16.2	23.1	19.4	21.3	23.6	23.2	23.2	21.6	21.6	19.3		
36	452232	344033	36.5	28.3	24.1	20.8	17.8	23.6	17.4	23.5	26.0	25.5	25.4	25.9	24.6	21.9		
37	452331	343910	25.3	26.1	25.4	22.6	22.2	15.6	20.6	19.9	20.4	18.7	20.5	22.7	21.7	19.3		

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.89)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
38	450389	337866	30.0	31.8	27.3	26.6	19.3	16.0	15.6	19.8	22.9	22.5	24.3	27.6	23.6	21.0		
39	450434	337781	26.7	27.7	28.3	25.3	18.2	13.4	11.9	18.7	20.0	18.2	19.4	21.1	20.7	18.5		
56	450570	337851	28.1	23.7	24.0	15.0	16.0	15.1	16.1	16.1	18.0	17.9	19.3	18.7	19.0	16.9		
40	450632	337929	33.8	32.3	33.6	24.5	23.3	18.8	19.5	21.0	23.5	22.7	26.7		25.4	22.6		
41	450555	337909	32.7	32.5	29.9	20.0	25.2	18.7	17.0	21.5	23.4	23.5	24.0	26.0	24.5	21.8		
48	450817	337592	36.6	31.5	26.7	21.2	22.5	28.5	26.1	24.9	26.1	26.9	28.9	26.6	27.2	24.2		
43	452733	336962	21.7	20.5	16.6	10.1	8.6	7.5	6.8	9.2	11.9	12.5	15.4	13.6	12.9	11.4		

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☐ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **Broxtowe Borough Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and Annualisation.

(a) = Missing tubes

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New or Changed Sources Identified Within Broxtowe Borough Council During 2025

Broxtowe Borough Council has not identified any new sources relating to air quality within the reporting year of 2025.

Additional Air Quality Works Undertaken by Broxtowe Borough Council During 2025

Broxtowe Borough Council has not completed any additional works within the reporting year of 2025.

QA/QC of Diffusion Tube Monitoring

BBC's diffusion tubes are supplied and analysed by Gradko Ltd. Since April 2008, BBC has entered into a contract with Gradko along with all Nottinghamshire Local Authorities to ensure that any deviations within different laboratory practices are ruled out. This enables data to be easily compared between the County authorities. The tubes are prepared using a 20% solution of triethanolamine (TEA) in de-ionised water. The tubes are exposed for one month before being returned for laboratory analysis. All of the tubes in 2025 were deployed in line with the Defra Calendar. The latest results for Gradko from the AIR PT/WASP Scheme are 100% of the results submitted were determined to be satisfactory.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Broxtowe Borough Council recorded data capture of 75% and above. Therefore, it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require Annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2026 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Broxtowe Borough Council have applied a national bias adjustment factor of 0.89 which is obtained from the National Diffusion Tube Bias Adjustment Factor Spreadsheet https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/ (Gradko 20%TEA has 28 studies with a 'Good' tube precision) to the 2025 monitoring data. A summary of bias adjustment factors used by Broxtowe Borough Council over the past five years is presented in Table C.1.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2025	National	03/26	0.89
2024	National	04/25	0.84
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93

The Local bias adjustment factor for the Zephyr was also calculated as shown in Table C.2 below.

Table C.2 – Local Bias Adjustment Calculation

	Local Bias Adjustment Input 1
Periods used to calculate bias	4
Bias Factor A	0.82 (0.71 - 0.98)
Diffusion Tube Bias B	22% (2% - 42%)
Diffusion Tube Mean (µg/m^3)	25.0
Mean CV (Precision)	4.2%
Automatic Mean (µg/m^3)	20.5
Data Capture	92%
Adjusted Tube Mean (µg/m^3)	20 (18 - 24)

Notes:

Although Broxtowe Borough Council have applied a national bias adjustment factor of 0.89 to the 2025 monitoring data. The Local bias adjustment factor has also been calculated as shown in Table C.2. The decision was made to use the National bias adjustment factor, as opposed to using the local bias adjustment factor, as the local bias adjustment factor had poor overall data capture and Section 7.221 in TG22 states that the Local bias adjustment factor should not be calculated using real time sensors, but rather a chemiluminescence analyser. BBC has a Zephyr which is a real time sensor and not a chemiluminescence analyser.

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Broxtowe Borough Council required distance correction during 2025.

Summary of Low Cost Air Quality Sensor Monitoring.

BBC's data from the Zephyr is managed by Geoff Broughton from Air Quality Data Management (AQDM) and any Local Site Operator (LSO) duties for the Zephyr are undertaken by Kate Ratcliffe at BBC. The live and historic data for BBC zephyr is available through the website; https://www.ukairquality.net/

Table C.3 – Details of Low Cost Sensor Site.

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	Sensor Type	In AQMA?	Distance to Relevant Exposure (m) (1,2)	Distance to kerb of nearest road (m) (1)	Inlet Height (m)
Trowell Zephyr 1893	Street Column 4, Iona Drive, Trowell NG9 3RF	Roadside	448607	339026	NO_2, PM_{10} and $PM_{2.5}$	Zephyr	No	1	2	2

Table C.4 – Monthly Air Quality Sensor Monitoring Results.

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean Data
Trowell Zephyr 1893	448607	339026	23.4	13.1	-	-	-	-	-	-	-	18.4	20.5	19.9	19.5

Appendix D: Map of all Monitoring Locations within the Borough of Broxtowe.

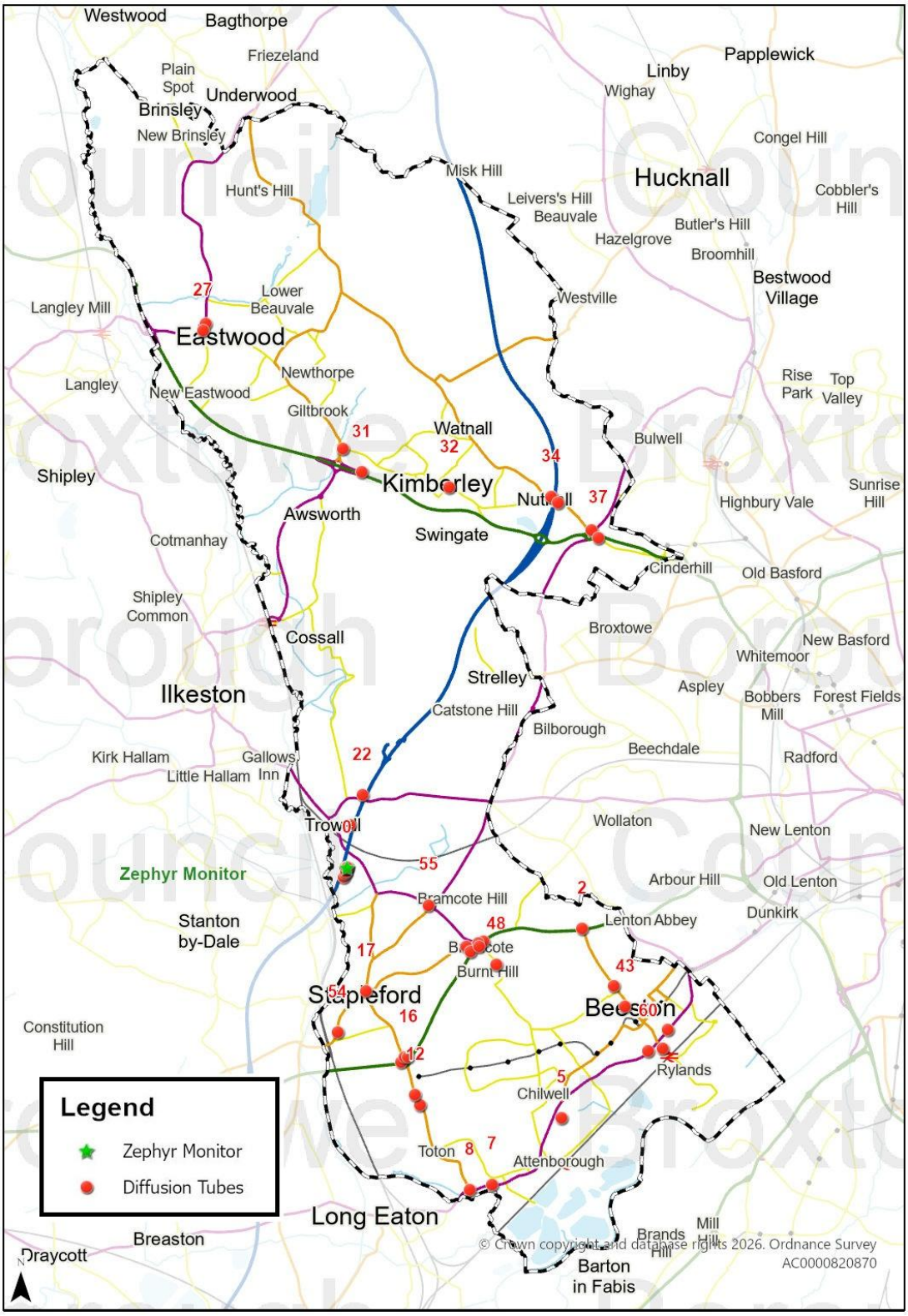


Figure D.1 – 2025 Diffusion Tube Locations and the location of the Zephyr Monitor.

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[3]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[3] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air Quality Annual Status Report
ATF	Active Travel Fund
AURN	Automatic Urban and Rural Network
BBC	Broxtowe Borough Council
BSIP	Bus Service Improvement Plan
CAZ	Clean Air Zone
COMEAP	Committee on the Medical Effects of Air Pollution
CV	Coefficient of Variation
Defra	Department for Environment, Food and Rural Affairs
Derv	Diesel Engine Road Vehicle
DCC	Derbyshire County Council
DCiC	Derby City Council
DfT	Department for Transport
D2N2	Local Enterprise Partnership for Derby, Derbyshire, Nottingham and Nottinghamshire
EMAQN	East Midlands Air Quality Network
EMCCA	East Midlands Combined County Authority
EU	European Union
EVCC	Electric Vehicle Cable Channels
EVI	Electric Vehicle Infrastructure

Abbreviation	Description
FDMS	Filter Dynamics Measurement System
FTZ	Future Transport Zones
GNSP	Greater Nottingham Strategic Plan
HGV's	Heavy Goods Vehicles
HS2	High Speed Train 2
HVO	Hydrotreated Vegetable Oil
ITSO	Integrated Transport Smartcard Organisation
LAQM	Local Air Quality Management
LAQM.PG(16)	LAQM Policy Guidance 2016
LAQM.TG(16)	LAQM Technical Guidance 2016
LCWIP	Local Cycling and Walking Infrastructure Plan
LEV	Low Emission Vehicles
LGA	Local Government Association
LGR	Local Government Reorganisation
LSTF	Local Sustainable Transport Fund
µg/m^3	Microgrammes of pollutant per cubic metre of air
MOT	Multi Operator Ticket in relation to travel on buses and trams
NEPWG	Nottinghamshire Environmental Protection Working Group
NET	Nottingham Express Transit
NCT	Nottingham City Transport
NH	National Highways
NHS	National Health Service
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NCiC	Nottingham City Council

Abbreviation	Description
NCC	Nottinghamshire County Council
O_3	Ozone
OHID	Office for Health Improvement & Disparities used to be Public Health England
OLEV	Office for Low Emission Vehicles
OZEV	Office of Zero Emission Vehicles
PHOF	Public Health Outcomes Framework
PM	Particulate Matter
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PT	Public Transport
PTP	Personalised Travel Planning
QA/QC	Quality Assurance and Quality Control
R&A	Review and Assessment
SAFED	Safe And Fuel-Efficient Driving
SEDBUK	Seasonal Efficiency of a Domestic Boiler in the UK
SO_2	Sulphur Dioxide
SQPS	Statutory Quality Partnership Schemes
TEA	Triethanolamine
UK	United Kingdom
UKSPF	United Kingdom Shared Prosperity Fund
ULEVs	Ultra Low Emission Vehicles
WASP	Workplace Analysis Scheme for Proficiency
WHO	World Health Organisation
WPL	Workplace Parking Levy

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Cabinet **21 July 2026**

Report of the Leader of the Council

Cabinet Work Programme

1. Purpose of Report

Cabinet is asked to approve its Work Programme, including potential key decisions that will help to achieve the Council's key priorities and associated objectives.

2. Recommendation

Cabinet is asked to RESOLVE that the Work Programme, including key decisions, be approved.

3. Detail

The Work Programme for future meetings is set out below. Key decisions and exempt items are marked with *.

8 September 2026	• Local Government Reorganisation Update • Update on the Housing Regulator's Report • Hate Crime Strategy • Kimberley Brewery Update • Housing Delivery Update

4. Key Decisions

This is not key decision.

5. Financial Implications

There are no additional financial implications.

6. Legal Implications

The terms of reference are set out in the Council's constitution. It is good practice to include a work programme to help the Council manage the portfolios.

7. Human Resources Implications

There are HR implications purely from the point of view of clarifying roles and responsibilities of Council Officers and responsibilities of partner agencies as required.

8. Union Comments

Not applicable.

9. Climate Change Implications

Not applicable.

10. Data Protection Compliance Implications

    This report does not contain OFFICIAL(SENSITIVE) information. There are no Data Protection issues in relation to this report.

11. Equality Impact Assessment

    There are no Equality Impact Assessment issues.

12. Background Papers

    Nil.

Document is Restricted

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