

Appendix 1

Broxtowe Borough emissions update

Borough emission data has now been updated by the Department for Energy Security and Net Zero. In 2022, the Borough of Broxtowe is calculated to have emitted 430.4ktCO₂e of carbon, which is a 6% reduction on the previous year. These reductions are attributed to the electrification of the grid, an increase in renewable energy generation and a reduction in gas used for heating.

Figure 1 provides a breakdown of the key sources of the Borough's carbon emissions for 2022.

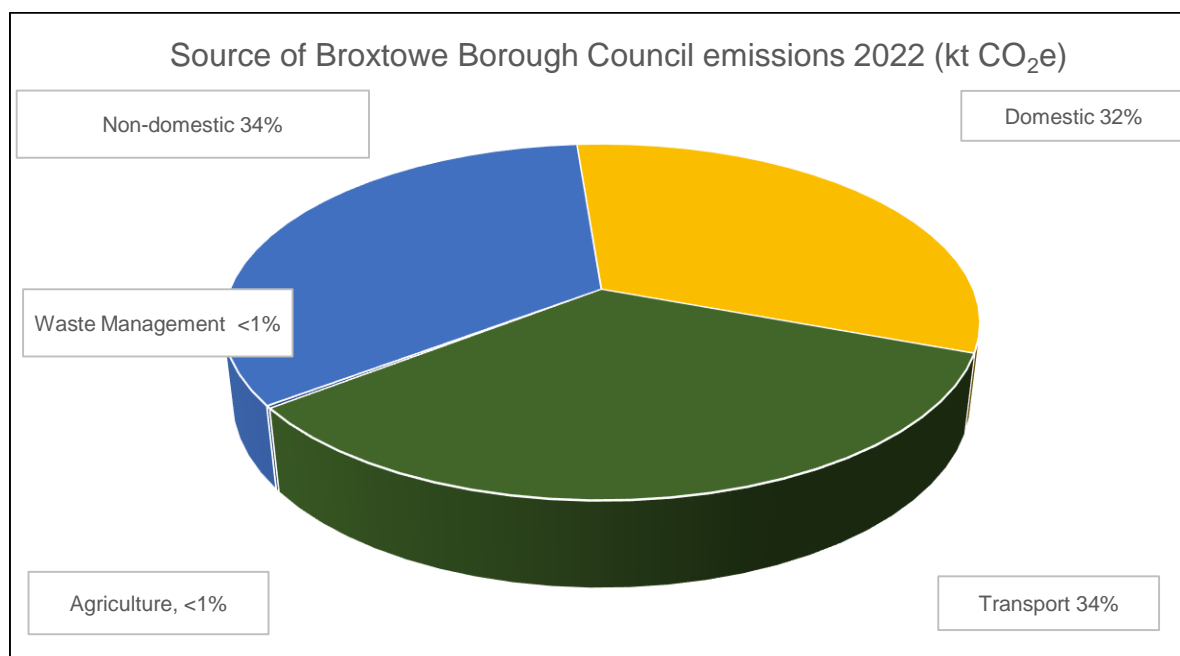


Figure 1 – Broxtowe Borough Council source of carbon emissions 2022.

A summary of the Borough's carbon emissions from 2005 to 2022 (released June 2024) can be seen in figure 2. The graph shows that borough emissions have fallen 34%, from 647.3 kTCO₂e in 2005 (6 tCO₂e per capita), to 430.4ktCO₂e in 2022 (3.8tCO₂e per capita).

Non domestic emissions (from commercial, industrial, retail and public sector properties) and transport account for 34% each (the largest proportion of Borough emissions). This is followed by domestic emissions (32%), from gas and electricity usage in domestic dwellings.

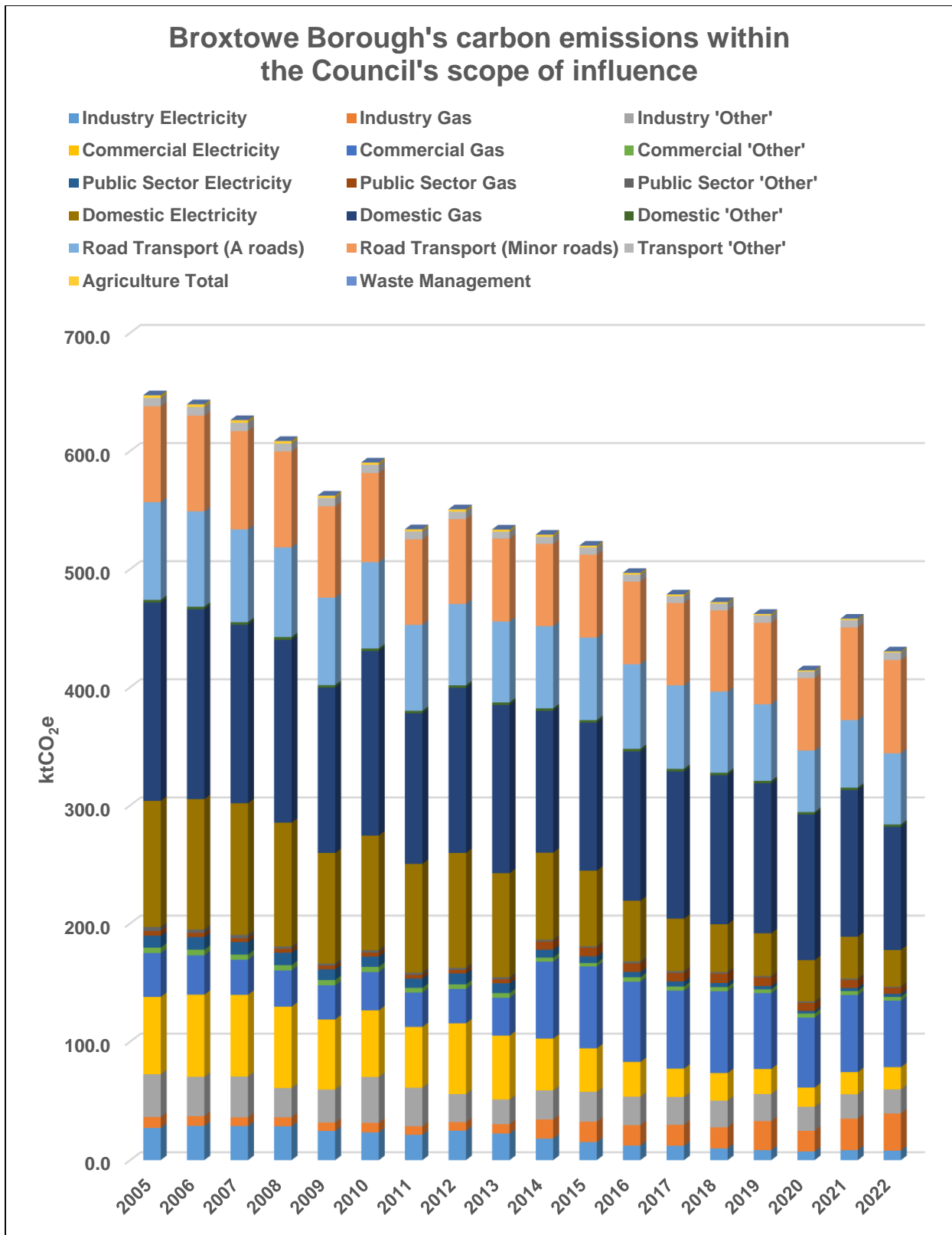


Figure 2 – Broxtowe Borough's carbon emissions within the Council's scope of influence.

Figure 3, shows Borough carbon emissions since 2005. The yellow dotted trend line indicates potential emission reduction levels up until the end of 2027.

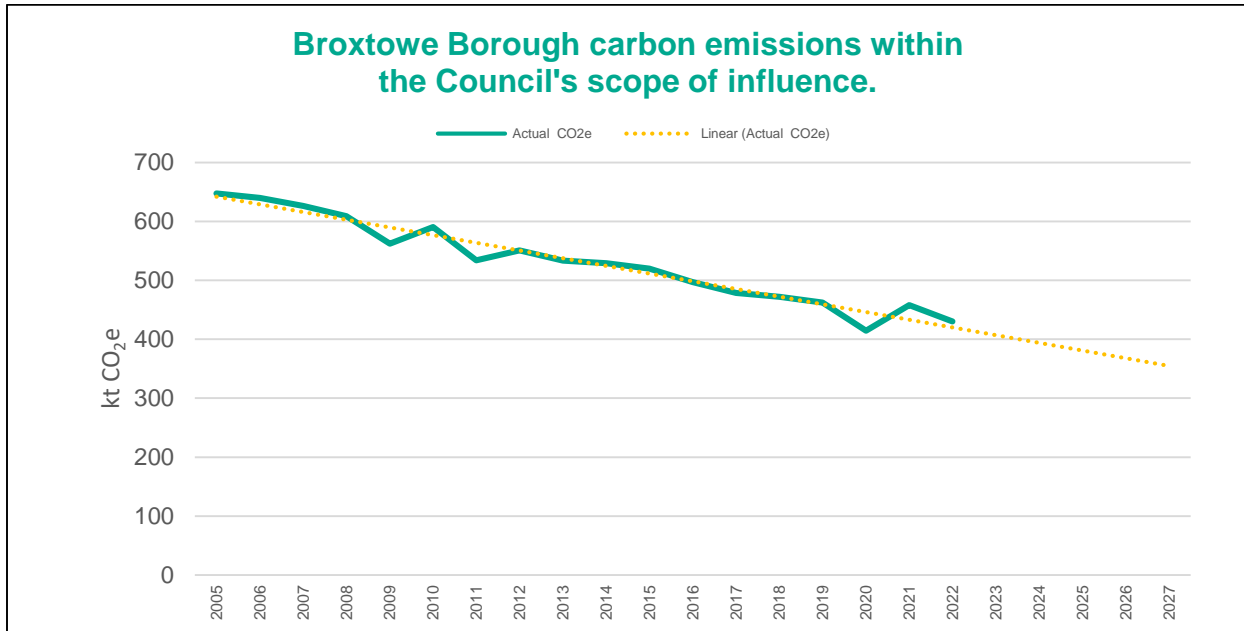


Figure 3 - Borough emission trend line

The Council's Carbon Footprint 2023/24

The information in figure 4 below shows a high level breakdown of how the Council's own operational emissions (Scopes 1, 2, and some of Scope 3 (business travel and losses due to transmission and distribution)) have been produced during 2023/24. These figures are currently provisional and maybe subject to change.

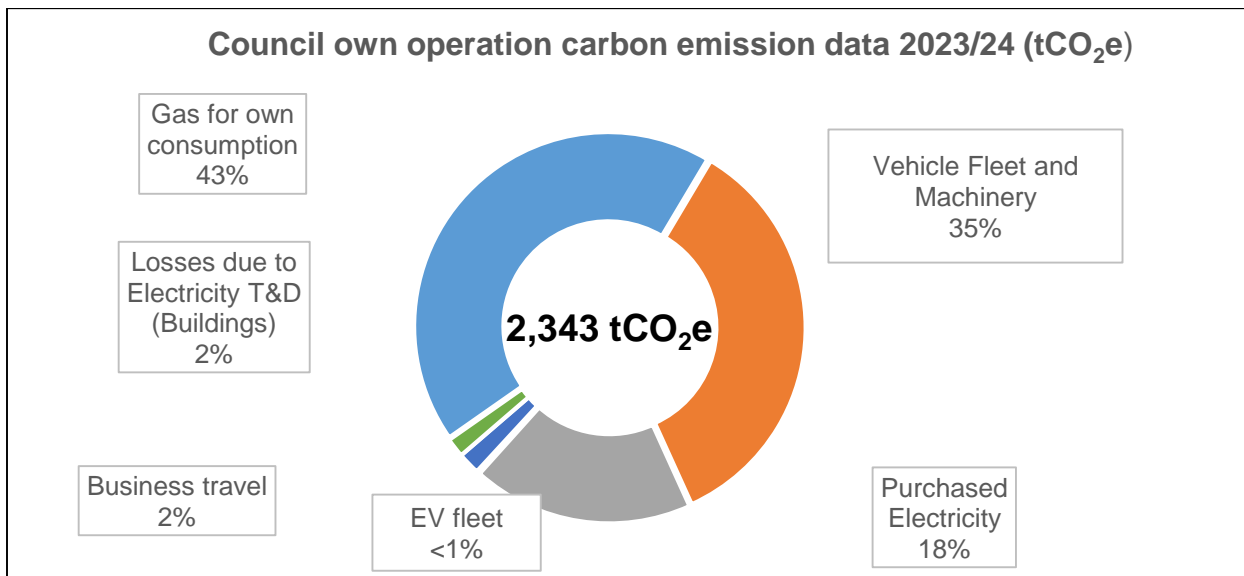


Figure 4 – Broxtowe Borough Council's Carbon Footprint 2023/24

The largest proportion of emissions for the Council continues to come from gas consumption (43%, this is a 1.8% reduction on the previous year), followed closely by vehicle fleet and machinery (35%, this is a 0.2% increase on the previous year) followed by purchased electricity (18%, this is a 1.4% decrease on the previous year). Further detail can be found in table 2. Overall there has been a 36% reduction in carbon emissions compared to the 2018/19 recalculated baseline and a 1.3% reduction compared to the previous year.

Emission	tCO ₂ e		
	2022/23	2023/24	Difference
Gas for own consumption	1,033	1,014	-1.8% ↓
Vehicle Fleet and Machinery	814	812	-0.2% ↓
Purchased Electricity	438	432	-1.4% ↓
EV fleet	5	5	0 ↔
Business travel	43	43	0 ↔
Losses due to Electricity T&D (Buildings)	41	37	-9.8% ↓
Total	2,374	2,343	-1.3% ↓

Table 1- Emission breakdown across 2022/23 and 2023/24

Progress towards carbon neutral 2027

The Council has committed to become Carbon neutral by the of 31 December 2027. As of the 3 September 2024, there are **1,214** days remaining to achieve this.

Figure 5 tracks the Council’s progress up to 2023/24. The dotted trend line in green highlights the trajectory towards carbon neutrality based on current performance.

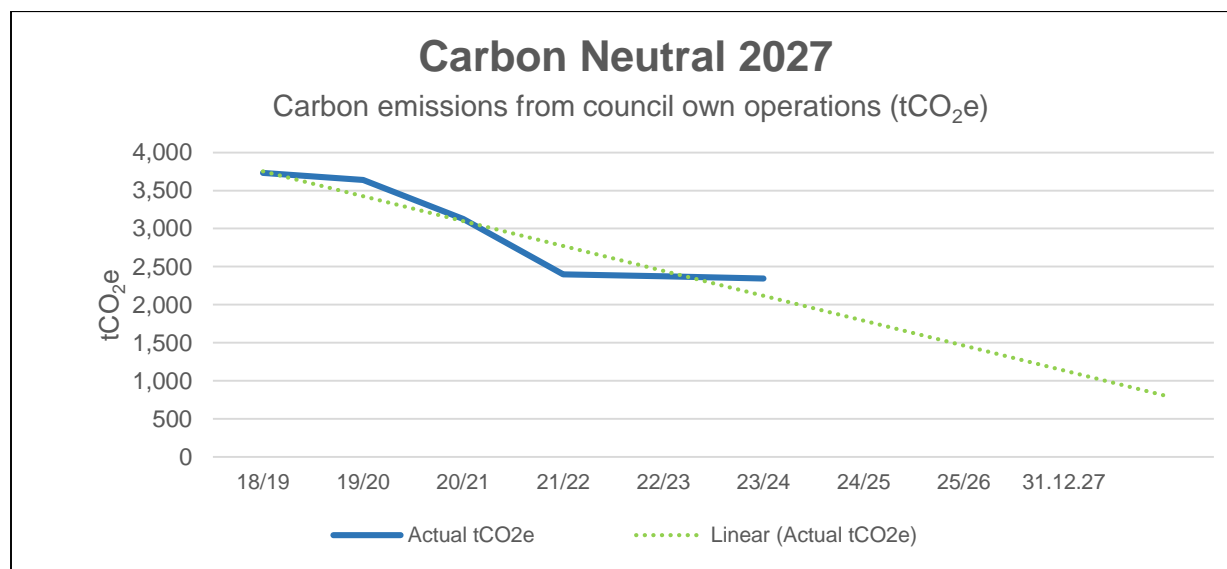


Figure 5 - progress towards carbon neutral 2027

Although there has been a decrease in emissions since 2018/19, this trend has recently plateaued. Many straightforward activities such as the installation of LED lighting,

optimising buildings and printers, replacing the Combined Heat and Power (CHP) at Bramcote Leisure Centre, have all now been completed.

To accelerate the rate of reduction once again, it is crucial to implement further energy efficiency measures across the Council estate using a fabric first approach. The Council has recently received draft Heat Decarbonisation Plans for three of its key building assets; the Council Offices in Beeston, Kimberley Depot and Bramcote Crematorium. Due to the potential re-build of Bramcote Leisure Centre, it was decided to exclude this building from the project scope.

The transition to Hydrotreated Vegetable Oil (HVO), which took place in April 2024 and replaced the use of diesel within the fleet, is projected to reduce carbon emissions by at least 700 tCO_{2e} per year. This significant reduction will be reflected in the carbon emission calculations for 2024/25.

The Council's Scope 3 baseline calculations

The Carbon Trust completed Scope 3 baseline calculations during the Spring of 2024, using 2022/23 data. This piece of work is fundamental in calculating a net zero target. The following section aims to provide key highlights from the report. The full report is presented within **Appendix 2**.

Definition of carbon scopes 1,2 and 3

The Greenhouse Gas protocol categorises greenhouse gas (GHG) emissions into three 'scopes'.

Scope 1 – emissions directly emitted by the organisation such as gas burnt in a gas boiler, tail pipe emissions from a vehicle owned by the organisation e.g. refuse truck etc.

Scope 2 – emissions indirectly emitted from the consumption of purchased electricity, heat or steam used in buildings the organisation operates.

Scope 3 - all other indirect emissions that occur in the upstream and downstream activities of an organisation. There are 15 categories of Scope 3 emissions including:

- i. Purchased goods and services.
- ii. Business travel.
- iii. Employee commuting.
- iv. Waste disposal.
- v. Investments
- vi. Leased assets and franchise

The difference between carbon neutral and net zero

It is important to clarify the difference between carbon neutrality and net zero, as these two terms mean very different carbon reduction scenarios.

Carbon neutrality is defined by the internationally recognised standard PAS2060, which sets out the requirements for the quantification, reduction and offsetting of greenhouse gas emissions. Carbon neutrality for an organisation only requires Scopes 1 and 2 to be measured, with Scope 3 encouraged but not mandatory. There is no requirement to reduce emissions on a trajectory and carbon offsets are accepted in order to become carbon neutral.

The definition of net zero has been drafted by the Science Based Targets initiative (SBTi) and requires all Scopes 1,2 and 3 emissions of an organisation to be measured, encompassing the whole organisation and its activities. Net zero targets must align to a 1.5°C science based target and the approach to residual emissions differs to that of carbon neutrality as specific greenhouse gas removals are required.

These differences are summarised in table 2.

	Carbon Neutral	Net Zero carbon (best practice)
Defined by:	PAS 2060 standard	Standard developing
Measurement: Scope 1 & 2	Required	Required
Measurement: Scope 3	Not required	Required
Carbon reduction target	No requirement to reduce carbon emissions on a certain trajectory in order to be carbon neutral.	Zero (Reduce to as close to Zero as possible). To be net zero, an organisation must be reducing its emissions along a 1.5°C trajectory across Scopes 1, 2 & 3.
Residual emissions	To achieve carbon neutrality, an organisation must purchase carbon offsets that either result in carbon reductions, efficiencies or sinks	For net zero, an organisation must purchase greenhouse gas removals that result in carbon sequestration from the atmosphere.

Table 2 - Definition of carbon neutral and net zero.

Sources:

<https://www.carbontrust.com/what-we-do/assurance-and-certification/carbon-neutral-certification>

<https://www.planetmark.com/about-us/>

Figure 6, provides a high level breakdown of the Council's Scopes 1, 2 and 3 emissions for 2022/23.

Of the 15 Scope 3 categories within the Greenhouse Gas Protocol, the following are applicable for the Council:

- Purchased good and services (including capital goods).
- Waste from operations.

- Housing and commercial properties.
- Fuel and energy related activities.
- Business travel.
- Employee commuting.
- Investments.

The Council’s scope 3 emissions for 2022/23 have been calculated at **20,673 tCO₂e**. Resulting in total carbon emissions from Council owned operations being 22,990 tCO₂e. Scope 3 emissions for the Council account for 90% of its total overall carbon emissions. Whilst the figure of is alarming, this is a typical proportion for any organisation, commonly found to be between 60-90%. Having calculated scope 3, the Council is now able to manage and mitigate these emissions.

From the Council’s overall footprint for 2022/23:

- Scope 1 emissions make up 8%
- Scope 2 emissions make up 2%

It should be noted that the calculations also highlight a -8.8tCO₂e avoided emissions segment. This is due to renewable electricity generation from solar panels located on the Council Offices in Beeston.

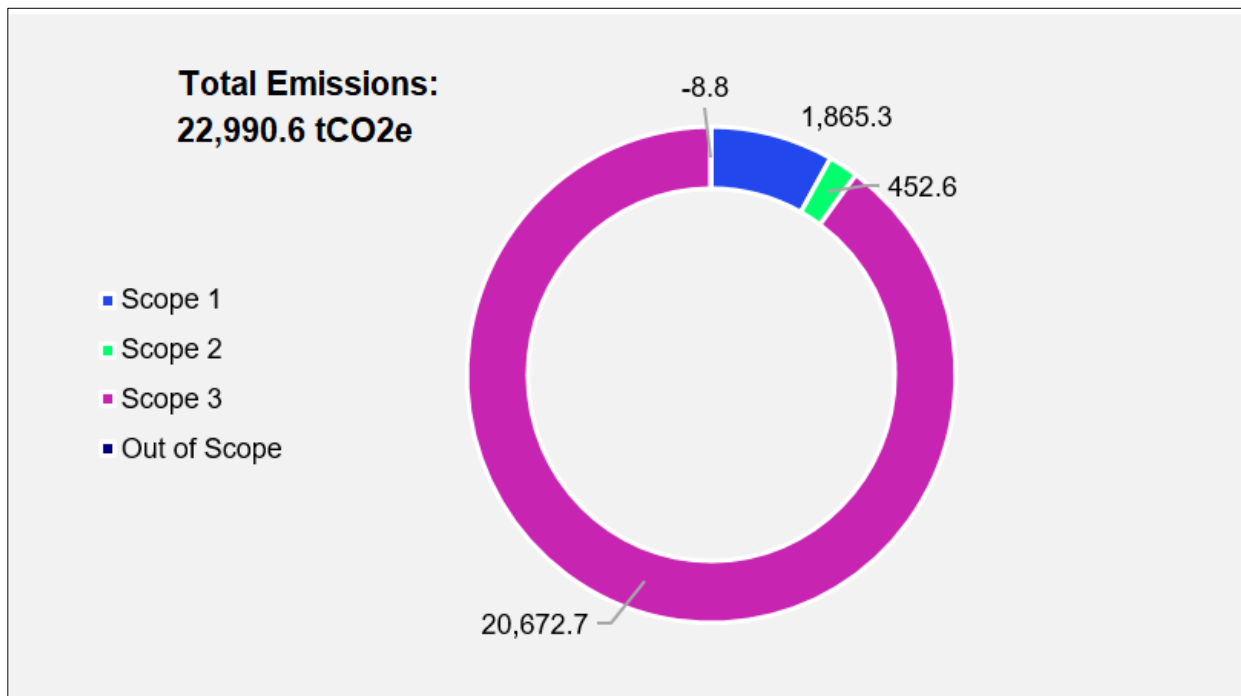


Figure 6 – Broxtowe Borough Council Scopes 1, 2 and 3 for 2022/23.

Figure 7 illustrates the sources of Scopes 1, 2 and 3 emissions in 2022/23.

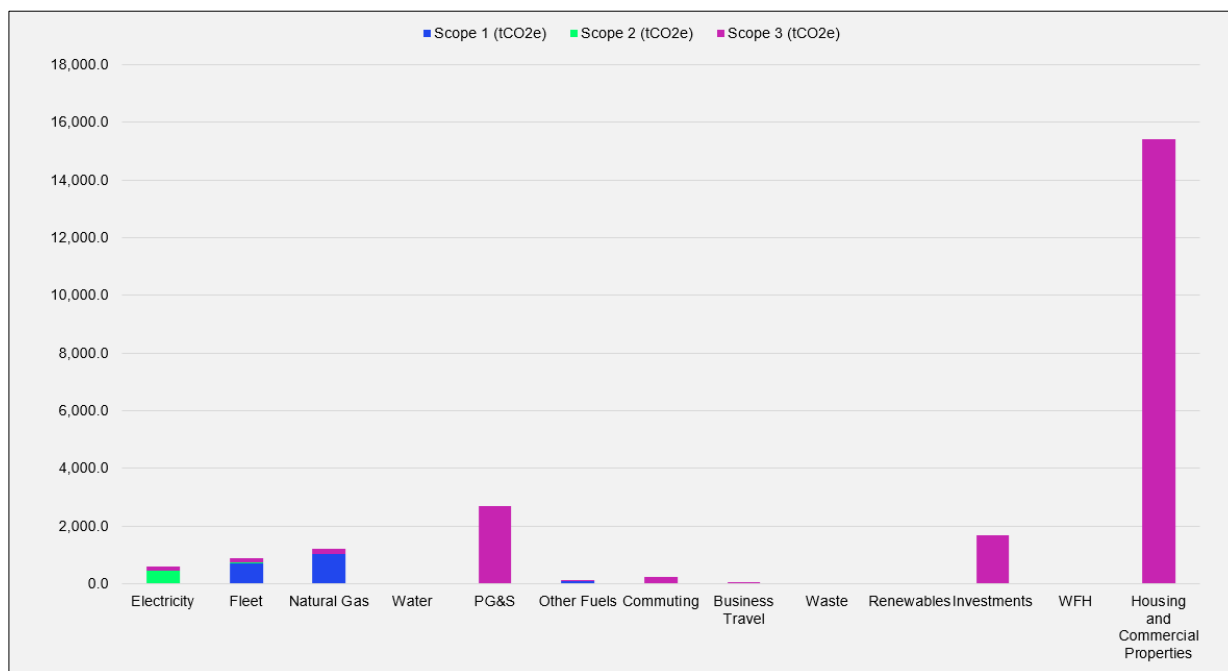


Figure 7 – Broxtowe Borough Council Scopes 1, 2 and 3 2022/23.

The largest contributor to the Council’s Scope 3 emissions is Housing and Commercial Properties, which contribute to 75% of the overall emissions. This is followed by purchased good and services at 13% and investments at 8%.

In terms of establishing a new baseline, it should be noted that the Carbon Trust have included additional buildings for scope 1 and 2 calculations. These will be incorporated moving forward. However, for parity, the Council will continue to report on data based on the same parameters used in 2018/19. This approach aims to provide a clear indication of the direction of travel for carbon emissions, ensuring consistency and transparency in tracking progress over time.

Emissions from Housing and Commercial Properties

The carbon emissions associated with the housing and commercial properties, include both social housing (4,671 properties) and commercial properties (110 properties). These are owned by the Council.

Figure 8 illustrates the percentage of emissions attributed to these two categories of properties, highlighting that social housing contributed 14,271 tCO₂e (93%) and commercial properties contributed 1,144tCO₂e (7%).

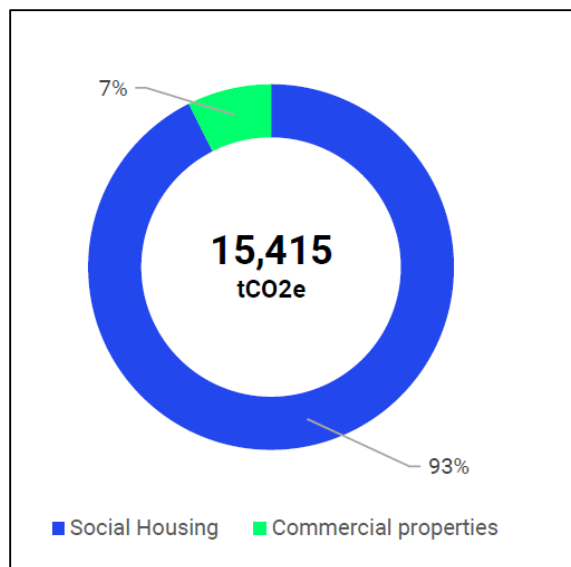


Figure 8 – Social Housing and Commercial property emissions breakdown

Given the substantial impact on a local authority's carbon footprint, many Councils opt to exclude housing and commercial emissions from their carbon reporting. In terms of transparency and for more accurate carbon reporting, the Council have decided that these will be included.

The social housing emissions are also captured within the Borough's emission reporting. However, this is the standardised approach for such reporting and although an element of 'double counting' occurs, this is currently the accepted reporting methodology.

Work is currently being undertaken with consultants from the University of Nottingham. This work will enhance the Council's understanding of the necessary retrofit measures and requirements across the Borough. This initiative will not only identify the required upgrades for private homes but also provide an accurate assessment of the requirements for the Council's social housing stock. This will help to address the Council's largest scope 3 emitter.

Emissions from purchased goods and services

Purchased goods and services (PG&S), includes cradle-to-gate (i.e. all emissions before the product is transported to the Council) and transportation emissions for items procured by the Council during 2022/23. This forms the second largest component of the scope 3 footprint at 13%, (2,695 tCO₂e), which is typical of a Borough council.

Figure 9 shows the breakdown of the emissions associated with procurement; the largest proportion of emissions result from the following three categories:

- Water supply, sewerage, waste management and remediation activities.
- Professional, scientific and technical activities.

- Manufacturing.

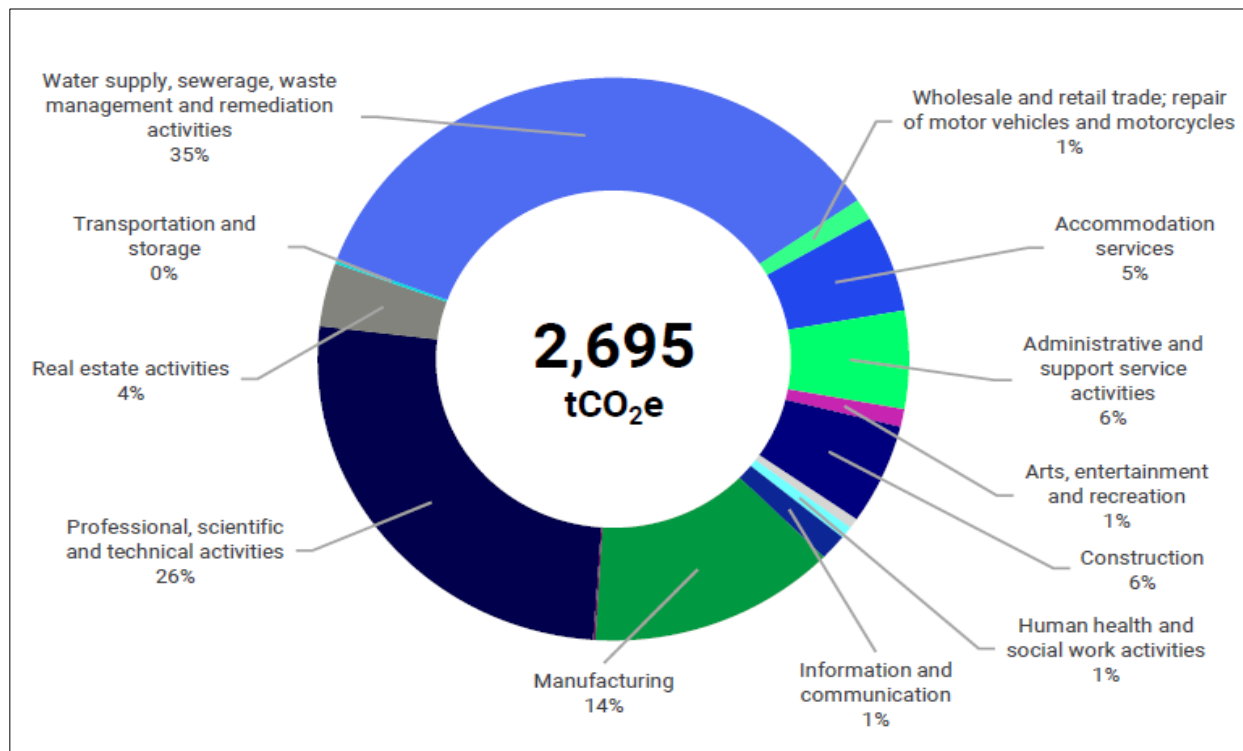


Figure 9 – Purchased goods and services breakdown 2022/23 using standard headings from the Carbon Trust emission tool kit.

Next Steps

Following on from the initial scope 3 report from the Carbon Trust it is important that the following steps are integrated and actioned:

Following on from the report

- Calculate the Council's Scope 3 emissions for 2023/24. This is a complex, data intensive and time consuming exercise for which additional support and employee resource may potentially be required.
- To report back to Cabinet once the 2023/24 calculations have been completed.
- Calculate the Council's trajectory to net zero using 2040, 2045 and 2050 scenarios against a 1.5°C temperature change.
- Subject to approval, create a high level roadmap to net zero including costs associated with reaching each target scenario. Given the complexity of this work and the necessity for accurate assurance and verification, it is recommended that an external consultant is engaged to undertake this task. There is sufficient

funding within the existing budget to cover this expense. The estimated cost is in the region of £15k to £20k.

- v. Complete a carbon footprint re-baselining exercise to also include a number of revisions to Scope 1 and 2 data capture. These will require the inclusion of:
 - buildings that have not previously been included (such as the Old Waste Site, Stapleford and the Pumping Station).
 - emissions associated with refrigerant use in air conditioning units across the estate (F-gas).

- i. To provide a clear indication of the direction of travel with the Council's Carbon reduction journey, the Environment team will also continue to provide a carbon emission report based on the initial reporting criteria for 2018/19, providing parity.