

# **Tamworth Borough Council Evidence base for net zero action planning**

**November 2024**



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## Executive Summary

### Background

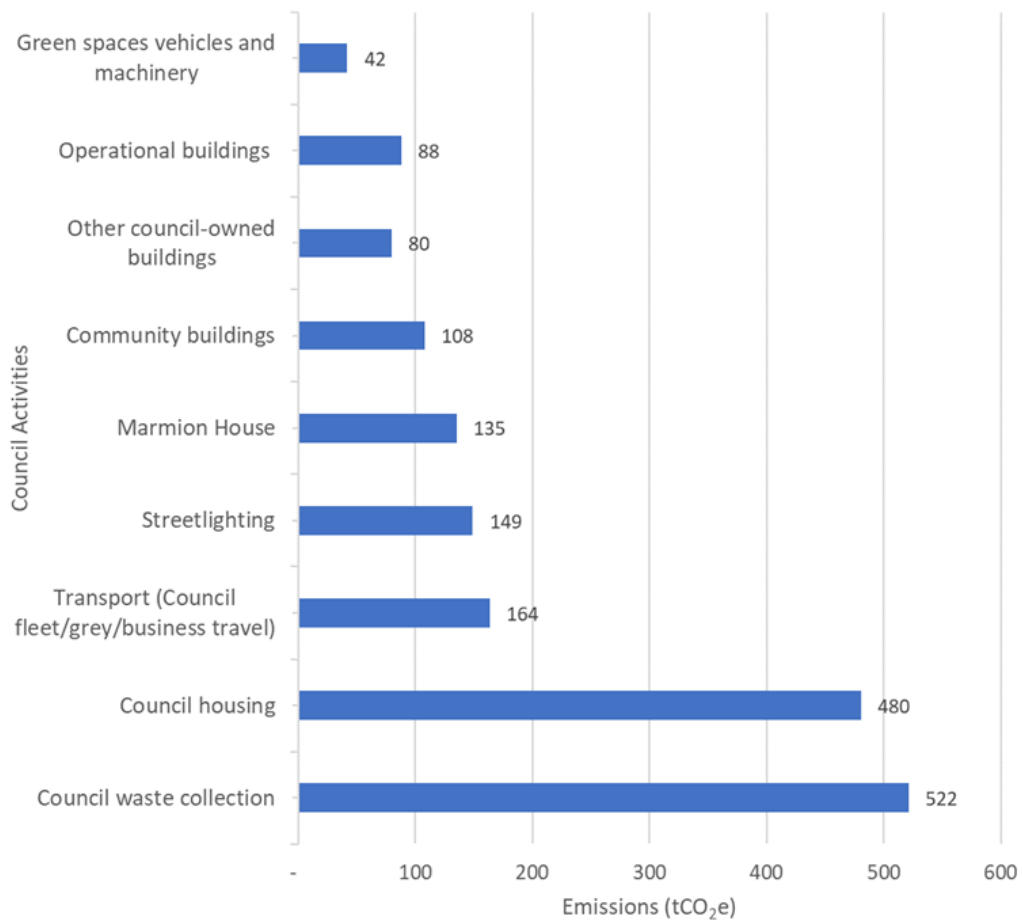
On the 19th of November 2019, Tamworth Borough Council (TBC) declared a climate emergency, following the UK Parliament's declaration in May 2019. The council made a commitment; its estate would become net zero by 2050 at the latest, or sooner, if deemed financially viable. To initiate the first step in the journey to net zero, emissions from the council's estate were calculated and compiled for the financial year 2019/20 in 2022, providing a baseline from which emissions reductions could start to be made.

Building on this previous work, this report presents the 'second step' in the net zero programme. This report presents an updated GHG inventory for the council's estate, covering the financial years 2019/20, 2020/21, 2021/22 and 2022/23. For the years 2020/21 and 2021/22, the data is incomplete, see Section 3 for more detail. To drive concerted, council-wide efforts for emissions reductions over the coming decades this report also includes a climate mitigation action plan and modelled emissions reduction scenario. The action plan contains detailed actions, with indicative costs and timescales, that will support TBC in reducing the emissions associated with their assets and service provision. The modelled emissions scenario illustrates how these actions could, if implemented in combination with some offsetting, achieve the council's net zero target by 2050. The modelling demonstrates the scale and sequence of action required by comparing with a 'business as usual' scenario which shows the potential consequences of inaction. This work has been closely informed by workshops with Council officers and elected members. The aim of this report is to provide a robust evidence base that will enable TBC to deliver their route to net zero.

### Tamworth's current GHG emissions

Tamworth Borough Council's GHG emissions for 2022/23 were estimated to be **1,769 tCO<sub>2</sub>e**. **Figure I** shows that in 2022/23, the largest sources of emissions were council waste collection (29%) and council housing (27%). It is important to note these are also the most uncertain results in the inventory for 2022/23. In terms of scope, council housing emissions comprise communal spaces and sheltered housing but do not include individual households in council houses or flats.

Figure I: Estimated total emissions (tCO<sub>2</sub>e) for Tamworth Borough Council 2022/23



**Operational buildings:** Covers the depot, Town Hall, and Assembly Rooms. Whilst it is an operational building, Marmion House is listed separately as the current fuel consumption is high and there is uncertainty around the future use of the building.

**Community buildings:** Covers assets such as the Castle and Museum, Anker Valley Sports Pitches, Tamworth Enterprise Centre, and the Bingo Hall

**Other council owned buildings:** Covers unmetered electricity supply, ticket machines, car park barriers

### Climate change mitigation action plan

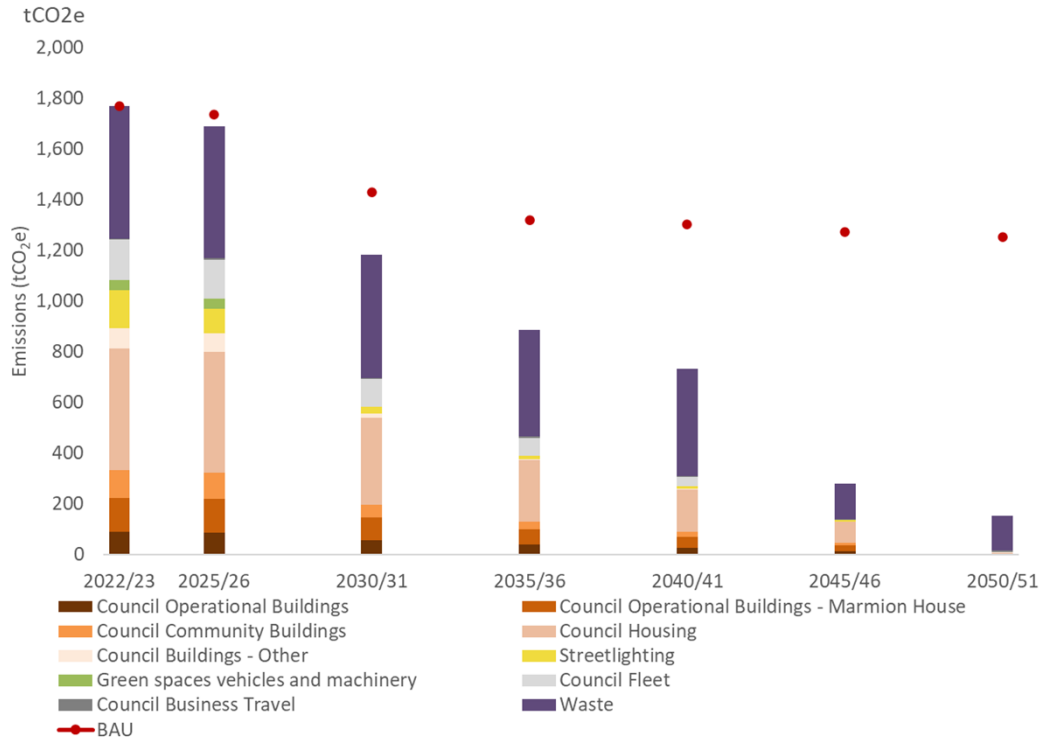
The inventory has been used to inform Tamworth’s net zero action plan. This plan contains actions for decarbonising the council estate and services across the areas of: council fleet, business travel, commuting, streetlighting and road infrastructure, buildings, waste, homeworking, renewables and supply chains and communications. The plan identifies indicative costs, key actors and timescales and key decision points so that the council can make informed decisions about how and when to implement actions on their journey to net zero.

### Emissions pathway

To illustrate the potential impact of this action plan on council emissions, a modelled emissions reduction pathway has been estimated, as shown in **Figure II**. This shows one potential route to net zero for the council and can be compared with a business-as-usual (BAU) scenario where no further action is taken by Tamworth Borough Council. The business-as-usual scenario estimates a 29% reduction in TBC’s emissions by 2050, due to decarbonisation of the national electricity system. This shows the importance of

focused action to drive significant cuts in Tamworth’s emissions over the coming decades. As emissions under this scenario are not projected to reach zero by 2050, Tamworth Borough Council would need to offset any remaining emissions to reach net zero.

Figure II: Projected emissions for Tamworth Borough Council under a modelled reduction scenario, 2022/23- 2050/51



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## 1 Introduction

There is an overwhelming scientific consensus that increasing greenhouse gases (GHG) emissions from human activities are causing global temperatures to rise, with serious knock-on effects for our atmosphere, land and oceans. In response to this, the Intergovernmental Panel on Climate Change (IPCC) released the Special Report on Global Warming of 1.5°C in 2018. That report clearly evidences that ensuring global temperatures stay well-below 2°C pre-industrial levels is crucial to reduce large risks to human and natural systems, and efforts should be made to pursue warming of only 1.5°C to prevent the largest risks. Following this, global accords such as the Paris Agreement were signed, and national goals for net zero were made. The UK has set a legal target to “vigorously pursue an ambitious target to reduce greenhouse gas emissions (GHGs) to 'net-zero' by 2050” across the whole economy.

It is widely recognised that achieving the UK target will require cross-government cooperation. Local authorities are well placed to influence emissions in buildings, transport, and waste whilst holding the best knowledge of the needs and opportunities of their area. Local authorities can also drive emissions reductions in their areas through their role as community leaders and major employers, as well as through their regulatory and planning capacities. Through their planning role, local authorities can leverage change by enabling sustainable development and placemaking, establishing energy efficiency standards for buildings, implementing sustainable travel programmes and infrastructure, approving renewable energy projects, pursuing district heating programmes and implementing sustainable waste management programmes. Therefore, local action to reduce carbon emissions is vital for the UK to meet its international commitments to reduce emissions.

Tamworth Borough Council (TBC) declared a climate emergency in November 2019. Recognising the urgent need to act, the council initiated a net zero roadmap. Aether was commissioned in 2022 to produce a greenhouse gas (GHG) inventory for the financial year 2019/20, which compiled emissions estimates from across the council's estate. The work included recommendations for improving emissions monitoring data and embedding emissions reductions action across the council's work.

The second step of the net zero roadmap, and the focus of this report, is to provide an evidence base to help drive TBC's action towards net zero. This report includes an update to TBC's GHG inventory, along with an action plan and a modelled emissions reduction scenario. The GHG emissions inventory update covers the financial years 2019/20, 2020/21, 2021/22 and 2022/23, although completeness of data varies considerably across this period. Providing a comprehensive understanding of the current emissions associated with TBC's estate enables effective climate mitigation actions to be developed. The modelled emissions reduction scenario presented in this report demonstrates how these actions can support TBC to meet their net zero target.



### Scope of this report

The aim of this report is to provide a robust evidence base that enables TBC to identify key emission sources and prioritise mitigation actions to achieve their net zero target.

**Section 2** presents the policy context for net zero obligations at the national and local levels, as well as for Tamworth specifically.

**Section 3** presents the council's GHG inventory for the financial years 2019/20, 2020/21, 2021/22 and 2022/23, and enables the council to identify key emission sources.

**Section 4** provides a climate mitigation action plan which has been developed to address the sources of emissions included within the inventory.

**Section 5** presents a modelled pathway to net zero for TBC and compares to the 'business as usual' emissions scenario which illustrates what could happen if TBC does not make a concerted effort to reduce their GHG emissions.

This report and climate mitigation action plan to reduce emissions is complemented by TBC's Climate Adaptation Strategy which outlines actions to address the unavoidable impacts of climate change that we are already experiencing and will continue to experience in the coming decades until global emissions are sufficiently reduced.

## 2 Policy Context

This section provides an overview of the net zero policy landscape. Details of relevant national and local policies relating to net zero in the UK and Tamworth are outlined. The policies detailed are drivers for local planning, infrastructure and development decision-making with regards to climate and net zero.

### National Net Zero Policy

The UK Climate Change Act, first adopted in 2008 and amended in 2019, aligns with the Paris Agreement. It commits the UK to a legally binding target; the UK must achieve a 100% reduction in net emissions by no later than 2050. Under the Climate Change Act, the UK Government is also required to set interim 5-year carbon budgets, which specify the volume of GHGs that can be emitted in a given period. The Carbon Budget Delivery Plan (2023) sets out the current package of proposals and policies that will enable carbon budgets to be met.<sup>1</sup>

The Sixth Carbon Budget was enshrined in law in 2021 and will run from 2033 to 2037. It sets out the amount of GHGs the UK can emit during the time period and still be on track for the net zero target. However, whilst carbon budgets are legally binding, government projections suggest that the UK is currently not on track to meet the sixth carbon budget, which requires a reduction of 78% below 1990 levels by 2035.

The UK Net Zero Strategy (2021) sets out ‘policies and proposals for decarbonising all sectors of the UK economy’<sup>2</sup>. The Strategy identifies different ways to meet the 2050 Net Zero target, depending on how decarbonisation options develop over the next decade.

### Local Net Zero Policy: Staffordshire

Local Authorities play a vital role in driving emission reductions and embedding mitigation and adaptation actions into business as usual. Policies set at the local level are key as they enable the UK to meet its national and international targets.

The Staffordshire County Council Climate Change Action Plan 2021-2025<sup>3</sup>, identifies climate change as one of the four key principles in the Council's Strategic Plan, setting the tone for Tamworth. Emissions reduction and climate change mitigation is a key priority, and the action plan includes actionable steps to make it a reality.

### Local Net Zero Policy: Tamworth

On the 19th of November 2019, Tamworth Borough Council declared a climate emergency, following the UK Parliament’s declaration in May 2019. The council made a commitment; its estate would become net zero by 2050 at the latest, or sooner, if deemed financially viable<sup>4</sup>.

<sup>1</sup> <https://www.gov.uk/government/publications/carbon-budget-delivery-plan>

<sup>2</sup> <https://www.gov.uk/government/publications/net-zero-strategy>

<sup>3</sup> <https://cape.mysociety.org/media/data/plans/staffordshire-county-council-6422236.pdf>

<sup>4</sup> <https://democracy.tamworth.gov.uk/mgDecisionDetails.aspx?Id=16340&Opt=1>

Tamworth Borough Council is currently considering a range of climate relevant measures. A Tamworth Electric Vehicle Strategy<sup>5</sup> has been approved by Cabinet. The Tamworth Housing Strategy 2020-2025 details a climate priority, to "ensure housing plays a key role in delivering Tamworth's response to climate change"<sup>6</sup>. As of 2024, a Climate Change Officer has been appointed to oversee these changes.

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<sup>5</sup><https://democracy.tamworth.gov.uk/documents/s38619/Tamworth%20Electric%20Vehicle%20Strategy.pdf>

<sup>6</sup><https://democracy.tamworth.gov.uk/documents/s32304/Housing%20Strategy%20Presentation.pdf>

### 3 Council emissions 2019-2023

This section outlines some key definitions of terminology used in GHG accounting. A detailed breakdown of the sources of estimated emissions for TBC's estate are given across the time period 2019 to 2023. Methodological changes for procurement and commuting emissions are detailed, as high uncertainty in these estimates mean that these emissions are reported separately from the inventory.

#### What is a greenhouse gas emissions inventory?

A greenhouse gas (GHG) inventory, or 'carbon footprint', is a dataset which quantifies the sources of GHG emissions for an organisation's operations or estate. The sources of emissions included in an organisation's inventory can vary depending on the type of organisation, the reason that it is reporting its emissions, and whether there are data available to provide an estimate. Sources can include a wide range of activities, and an inventory can be produced for an organisation, country or other geographical area.

Producing a GHG inventory is important for a few reasons:

- If an organisation wants to reduce its emissions, it is crucial to understand where the emissions are coming from.
- It allows organisations to track their progress against targets over time.
- It can be used to inform future decision-making and policy.
- It provides a way for them to compare themselves to similar organisations, and to undertake benchmarking.

For TBC, producing a GHG inventory is a vital step in the council's net zero roadmap. Having a complete inventory allows the council to better understand the main sources of emissions, to consider the uncertainties in the data and to analyse changes over time. The inventory provides an evidence base from which TBC can track changes, identify emissions reduction possibilities and establish a realistic pathway for achieving its net zero target by 2050.

TBC has specific requirements of the second step in their net zero roadmap to deliver against from the November 2019 recommendation<sup>7</sup>. These include:

- Make the Council's activities net zero carbon by 2050, or sooner, if the council is financially able to do so;
- Provide supporting information to assist with future budget cycles and the investment strategy to take into account the actions the council will take to address this emergency;
- Quantify budget requirements.

#### Definitions

In line with the council's commitment, the term "decarbonisation" is used in this report to mean the same as becoming "carbon neutral" or "net zero carbon". These terms refer to the balancing of carbon emissions against carbon removals and/or carbon offsetting with the net result being zero, as illustrated in **Figure 1: Options for achieving net zero**

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<sup>7</sup> <https://democracy.tamworth.gov.uk/documents/s32653/Net%20Zero%20Carbon%20-%20baseline%20reporting.pdf>

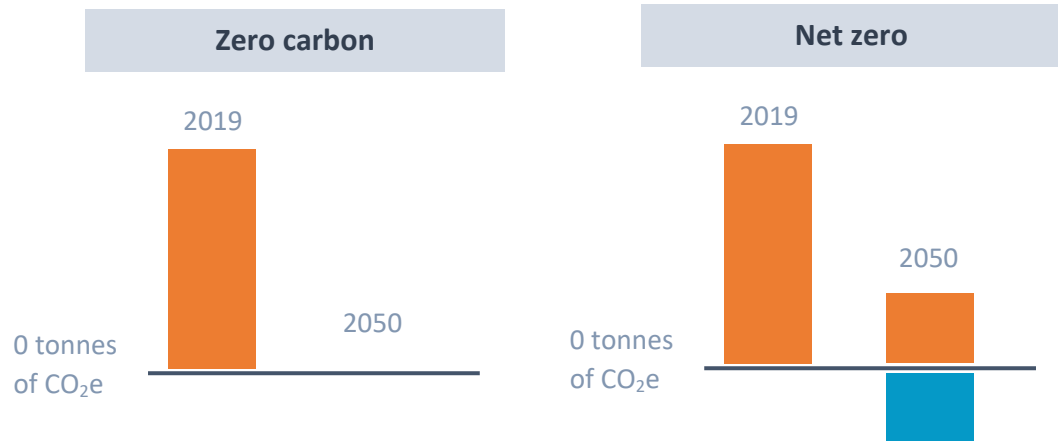
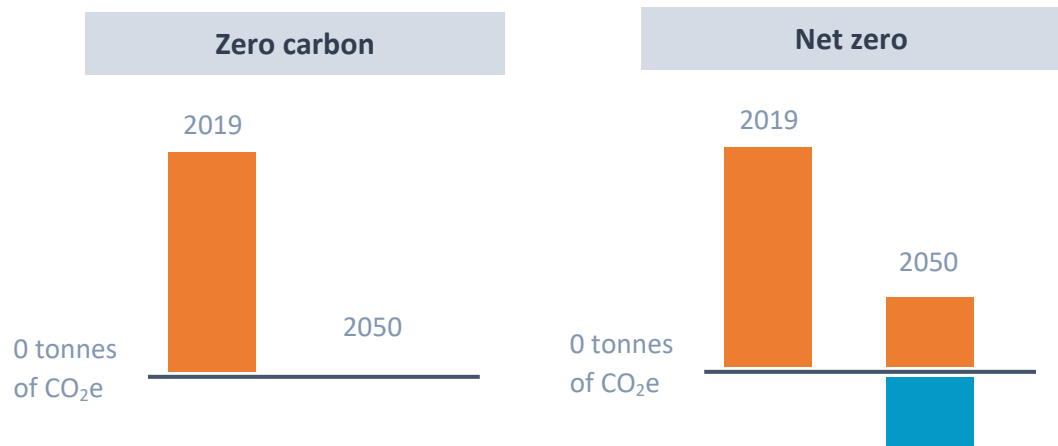


Figure 1: Options for achieving net zero



“Net zero” is used in this report as shorthand to cover the net balancing of the main greenhouse gases: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). The global warming potentials of CH<sub>4</sub> and N<sub>2</sub>O are used to calculate the equivalent warming to CO<sub>2</sub>, to allow the estimation of total GHG effects on the atmosphere in one unit, CO<sub>2</sub>-equivalent, or CO<sub>2</sub>e. The council agreed that their net zero targets should cover carbon dioxide, methane and nitrous oxide, not just carbon dioxide. Any reference to “carbon neutral” and “decarbonisation” in this report is understood to be shorthand to cover methane and nitrous oxide as well as carbon dioxide.

As defined by the CCC, a net-zero (i.e. carbon neutral) target requires “deep reductions in emissions, with any remaining sources offset by removals of CO<sub>2</sub> from the atmosphere (e.g. by afforestation)”. This removal requires either the purchase of carbon offsets or direct carbon removal through additional carbon removal and storage (“sequestration”) activity on an organisation’s estate.

The first year an emission inventory is compiled is referred to as a baseline year and is used as a reference point to track and monitor changes in emissions over time, including progress. The baseline represents the total GHG emissions that have occurred within a given year. The baseline year for TBC is the financial year 2019/20. For more detailed information on the inventory methodology and scope, see **Appendix 1**.

### Tamworth Borough Council's GHG inventory, 2022/23

For the financial year 2022/23, Tamworth Borough Council's total GHG emissions are estimated to be **1,769 tCO<sub>2</sub>e**. Lichfield District Council's 2022 emissions were 1,050 tCO<sub>2</sub><sup>8</sup> and South Staffordshire Council's 2021/22 emissions were approximately 1,060 tCO<sub>2</sub>e<sup>9</sup>. *However, caution should be taken when comparing these figures, as differences in the organisation size, operational activity, and coverage of scope 3 emissions sources varies between these local authorities.*

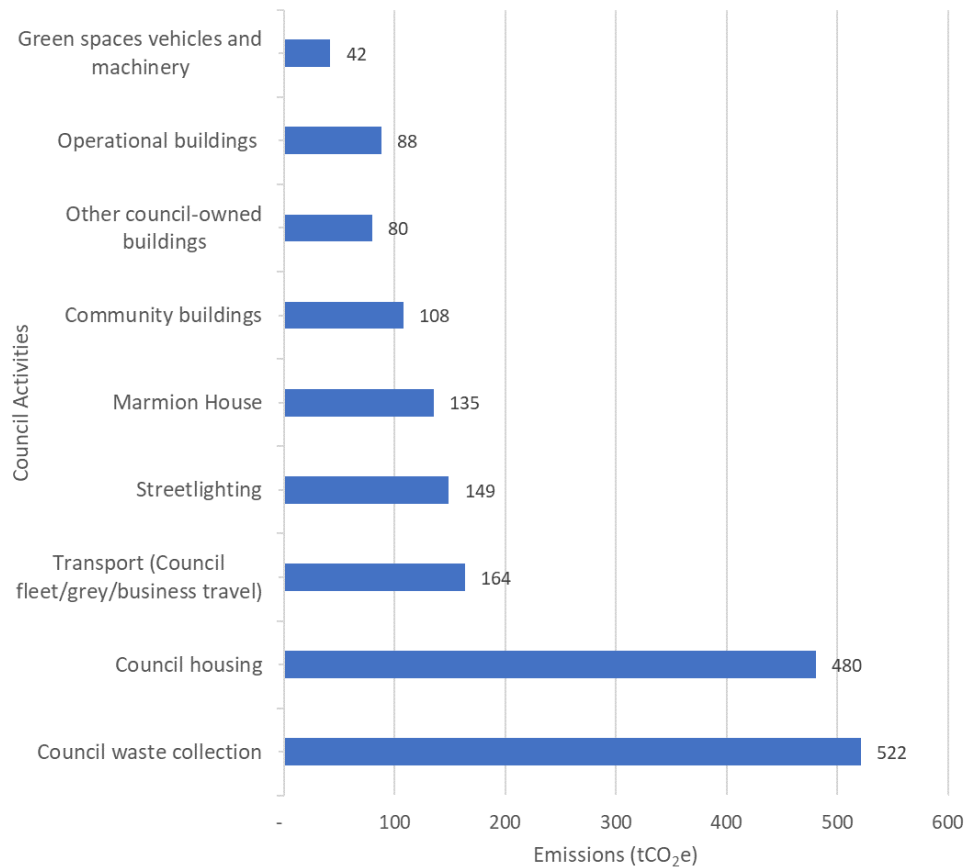
**Figure 2** shows that in 2022/23, the largest sources of emissions were council waste collection which comprised 29% of the total emissions, and council housing which comprised 27% of the total emissions. The council waste collection figure is uncertain as these estimates are based on tonnes of fuel use. Generalised emission factors are used based on fuel type. Data was collated for municipal refuse to EfW, kerbside recycling and garden waste but there were data gaps for commercial waste. As a result, these emissions have not been captured in the inventory. Council housing comprises communal areas and sheltered housing and does not include tenants use. Whilst this is a large source of emissions, there are significant uncertainties in estimates, due to inconsistencies in data collection and data gaps. There is no data recorded for some council housing properties in 2022/23, yet these properties are included in estimates for other years in the time series.

Marmion House, Tamworth Borough Council's main office, has been separated from the operational buildings to illustrate the scale of emissions from this building.

*Figure 2: Estimated total emissions (tCO<sub>2</sub>e) for Tamworth Borough Council 2022/23*

<sup>8</sup> <https://www.lichfielddc.gov.uk/carbon-reduction/climate-change-resources>

<sup>9</sup> <https://www.sstaffs.gov.uk/environment-and-climate/climate-change/council-carbon-footprint>



**Operational buildings:** Covers the depot, Town Hall, and Assembly Rooms. Whilst it is an operational building, Marmion House is listed separately as the current fuel consumption is high and there is uncertainty around the future use of the building.

**Community buildings:** Covers assets such as the Castle and Museum, Anker Valley Sports Pitches, Tamworth Enterprise Centre, and the Bingo Hall.

**Other council owned buildings:** Covers unmetered electricity supply, ticket machines, car park barriers.

For the financial year 2022/23, a more detailed breakdown of emission estimates by category are presented in

**Table 1.** Notably, procurement and commuting emissions have been excluded from the total, and the emissions stemming from these sources are shown in **Table 2.**



Table 1: Estimated total emissions by category for Tamworth Borough Council 2022/23 (tCO<sub>2</sub>e)

Category	Sub-category	Coverage	Scope	2022/23	
				Emissions (tCO <sub>2</sub> e)	% of total emissions
Council-owned buildings	Operational buildings (electricity)	Depot, Assembly Rooms	2+3	39	2%
	Operational buildings (gas)	Depot, Assembly Rooms	1	49	3%
	Marmion House (electricity)	Marmion House	2+3	50	3%
	Council-owned buildings: Marmion House (gas)	Marmion House	1	85	5%
	Community buildings (electricity)	Various assets including Bingo Hall, Castle and Museum, Anker Valley Sports Pitches, and Tamworth Enterprise Centre*	2+3	79	4%
	Community buildings (gas)	Various assets including Bingo Hall, Castle and Museum, Anker Valley Sports Pitches, and Tamworth Enterprise Centre*	1	30	2%
Council-owned/run housing: sheltered housing, communal areas of council owned non-sheltered housing (council, private tenants, private owners)	Council Housing (electricity)	Sheltered Housing e.g. Ankermoor Court, Annandale, Bright Crescent, Cheatle Court, and Sunset Close* Standard Housing e.g. Lichfield Street, Carlcroft, Masefield*	2+3	123	7%
	Council Housing (gas)	Sheltered Housing e.g. Ankermoor Court, Annandale, Cheatle Court, and Sunset Close*	1	357	20%
Other council buildings	Other buildings (electricity)	Unmetered electricity supply, ticket machines, car park barriers	2+3	80	5%
Streetlighting	Streetlighting	Streetlighting	2+3	149	8%
Council travel	Council fleet/grey fleet	Council vans	1	159	9%
Other council travel	Business travel	Private car and rail use	3	5	0.3%
Council Services Suppliers/Contractors	Green spaces vehicles and machinery	Mechanical sweepers and plant machinery	3	42	2%
Waste	Council waste collection and disposal	Collection and transport of waste to Four Ashes Energy Recovery Facility, recycling facilities, and garden waste facilities	3	522	29%
	<b>Total</b>			<b>1,769</b>	<b>100%</b>

\*Please see the TBC Assets file provided alongside the inventory for full details

### Emissions related to procurement, commuting and homeworking for 2022/23

Emissions from procurement and commuting are typically not included in GHG inventories for net zero targets and have been excluded from this inventory for two reasons. Firstly, there is limited data for these activities, and secondly, methodologies for estimating procurement and commuting emissions are not yet well established and have high uncertainty. Therefore, the emissions associated with procurement and commuting for 2022/23, have been derived through assumptions (see section 3.5).

Homeworking emissions were also excluded from this inventory due to the limited influence the council has to impact reductions for this category.

However, emission estimates have been given in **Table 3** for indicative purposes, as it is important for TBC to consider potential ways in which these sources could be reduced.

*Table 2 Estimated emissions from procurement, commuting and homeworking for Tamworth Borough Council 2022/23 (tCO<sub>2</sub>e)*

Definition of categories	Category	2022/23	
		Emissions (tCO <sub>2</sub> e)	% of total emissions
Excluded from baseline	Procurement of other goods and services	5,542	N/A
Excluded from baseline	Commuting	143	N/A
Excluded from baseline	Homeworking	94	N/A

### Methodologies for procurement, commuting, and homeworking emissions

For commuting emissions, the trend is based on our assumptions of changing working patterns. Emissions were calculated based on the assumption that in 2019/20, everyone was commuting, in 2020/21, no-one was commuting due to the Covid-19 pandemic, and for 2021/22 and 2022/23, commuting was assumed to be 2 days a week on average due to hybrid working patterns and working from home (WFH).

For procurement emissions, whilst the council has influence over emissions from this source, it does not have direct control. The summary figure presented in **Table 2** is an estimate of the scale of procurement emissions, based on the principle that as spending has increased, the associated emissions have also increased. To estimate emissions, calculations were based on factors of carbon intensity per amount spent<sup>10</sup> and applied to the financial accounts summary. The large amount of estimated procurement emissions for 2022/23 compared to previous years is likely to relate to TBC's recent large purchase of an electric vehicle fleet. Even though the fleet has not yet arrived, this purchase would be counted in the 2022/23 year's spend.

Homeworking emissions were estimated by making an assumption on the number of full time employees (FTE) who work from home and multiplying that by an emission factor representing the estimated emissions associated per FTE. The emission factor includes assumptions on the mix of heating types used to heat employees' homes, along with average the duration heating is on, how many other people are at home whilst

<sup>10</sup> Table 13: Indirect emissions from the supply chain:  
[https://assets.publishing.service.gov.uk/media/5a7f3a06ed915d74e622928d/Table\\_13\\_Indirect\\_emissions\\_from\\_supply\\_chain\\_2007-2011.xls](https://assets.publishing.service.gov.uk/media/5a7f3a06ed915d74e622928d/Table_13_Indirect_emissions_from_supply_chain_2007-2011.xls)

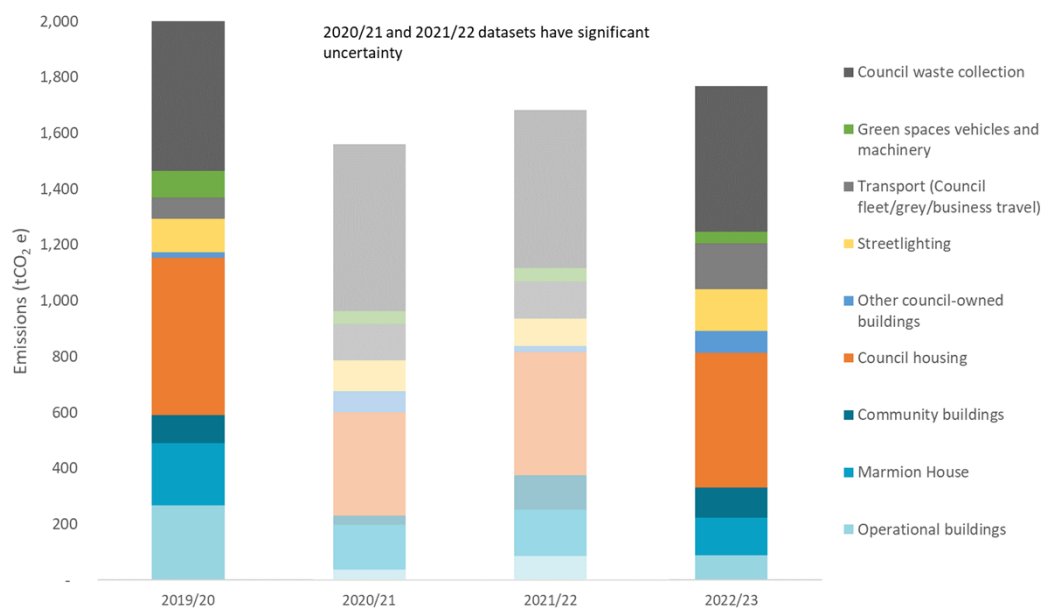
homeworking, and estimated electricity consumption for lighting and IT equipment.<sup>11</sup> A staff survey to obtain information on the frequency of homeworking and energy consumption would help improve the accuracy of these calculations.

### Total emissions from 2019/20 to 2022/23

Figure 3 shows the estimated emissions across the time series, from 2019/20 to 2022/23. However, estimates for 2020/21 and 2021/22 have significant uncertainty because of gaps in the data, particularly building energy. To reflect this, these are shown as uncertain in the graph below.

The largest individual source of emissions across the time series is council waste collection, which is estimated based on tonnage of waste collected. Emissions from this source are solely due to the transport of waste to the EfW, recycling centres, and composting sites. The emissions sources with greatest variations across the time series are operational buildings, other council-owned buildings and council housing. This is likely a result of a combination of factors: Covid-19 impacts, energy data uncertainty, reduction in carbon intensity of the electricity grid, and any energy efficiency measures implemented.

Figure 3: Total emissions for Tamworth Borough Council, time series from 2019/20 to 2022/23



### Assumptions and limitations

For the data collection process, Aether and the Climate Change Officer at TBC liaised with relevant officers for each activity area via email. Each officer was asked to provide data in line with clear requirements in a predefined format. The aim was to build upon the initial inventory compiled for the baseline year, 2019/20. The responses and completeness of the data received was tracked, as shown in Table 3.

11

<https://sustainablesotlandnetwork.org/uploads/store/mediaupload/1879/file/PBDR%20Guidance%202022%20Final%20pdf.pdf>

Notably, there were inconsistencies in how the data was reported across the time series, affecting data quality. There are gaps in data records, particularly in 2020/21 and 2021/22 for these categories:

- Sheltered housing, electricity;
- Standard housing, gas;
- Community buildings, electricity;
- Other, electricity, gas.

This resulted from incomplete coverage of meter reading data and organisational understanding of data requirements for GHG accounting. This has led to significant uncertainty in energy emissions estimates. Recommendations have been given for continual improvement for data capture and recording processes, and organisational understanding has and will continue to increase e.g. with the appointment of a climate change officer.

Table 3: Data collection process and description of identified data gaps/assumptions

Data collected	Covers	Year	Data gaps/assumptions
Council-owned domestic buildings	Gas and electric usage for standard and sheltered housing Standard = usage in communal areas. Sheltered = usage in whole site	2019/20 – 2022/23	Significant gaps due to a lack of meter reading data.
Council-owned non-domestic buildings	Gas and electric usage for: Operational buildings: Marmion House, Town Hall, Assembly Rooms, Depot Community buildings: activity centre, castle & museum, market/street displays, sports pitches Other: cemeteries, public conveniences	2019/20 – 2022/23	Data gap for 2021/22: Community buildings, electricity, Other, gas and electricity.
Fleet vehicles Green spaces and machinery	Fleet Fuel usage for diesel vans Green spaces and machinery Diesel mechanical sweepers and mechanical plant	2020/21 – 2022/23	Assumed no data gaps. Mowers and tractors combined with mechanical sweepers and mechanical plant data from 2019/20. This will need to be modified again in 2023/4 because all diesel including fleet is combined in the reporting.
Waste	Municipal, recycling, and green waste tonnages sent for processing at Energy from Waste facility	2019/20-2022/23	Assumed no gaps. Data on fuel consumption would significantly improve the confidence in the estimate.
Business travel	Car mileage claimed and cost of mileage Public transport travel expenses	2019/20-2022/23	Transport expenses not split by transport mode, so assumption made on rail/bus/taxi split
Streetlighting	Unmetered electricity supply, car park lighting, and highway lighting expenditure Unit price provided to convert to energy usage	Estimated usage for 2019/20, 2020/21 – 2022/23	Assumed unit price provided by TBC used to convert billed electricity consumption (excl. charges) into kWh. No data for 2019/20 so assumed same as 2020/21.
Procurement (not included in baseline)	Expense transaction report used to identify key spend areas which have an associated emissions activity	2019/20 – 2022/23	No data gaps but this source is only included to give an approximate emissions estimate,

			as spend and emissions are not always correlated
Homeworking (not included in baseline)	FTE staff numbers used to estimate electricity and heating consumption when homeworking	2019/20-2022/23	All FTE numbers provided but use of average emissions per FTE means the estimates do not account for different heating types
Commuting (not included in baseline)	Distance travelled for commuting, split by travel mode	2019/20 – 2022/23	Estimated using the UK’s National Travel Survey to obtain average proportions of commutes done by car, bus, train, taxi, cycling, or walking. Proportions applied to distances derived from staff home postcode data. Assumptions made on which distances map to which modes and how often staff commute per week

With regards to the data collection process, it is advisable to:

- Establish senior leadership ‘buy in’;
- Allocate resources to support data collection;
- Assign responsibilities for data collection within the council e.g. Energy Manger to pass on invoices to assigned data handler.
- Establish clear data collection procedures e.g. timescales, documentation.

This will help TBC to implement the Greenhouse Gas Protocol Accounting and Reporting<sup>12</sup> principles of relevance, completeness, consistency, transparency and accuracy. These rigorous standards facilitate effective goal setting and tracking of progress against the net zero roadmap. For more details see **Appendix 1**.

<sup>12</sup> <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

## 4 Development of the mitigation action plan

Tamworth Borough Council has developed a climate change mitigation action plan, presented in **section 5**. This section describes the principles used to develop this plan and how it should be monitored and reviewed.

The actions within the plan will enable the council to prioritise emissions reduction from its operations and set a good example of emission reduction approaches for the wider area to follow. The plan focuses on actions which can be implemented out to 2050 to achieve the net zero target.

The action plan has been informed by stakeholder engagement with officers and members of Tamworth Borough Council, consideration of regional and national policy and emissions reduction modelling.

### Structure of the action plan

Actions have been grouped by sector and, to the extent possible, ordered in a sequential manner. It is important to note that there are linkages between actions and therefore there may be opportunities to implement actions together, rather than in isolation. In addition to the mitigation action plan, cross-cutting actions that will help ensure holistic, systemic action is taken to embed climate mitigation across the council estate have been identified.

This is Tamworth Borough Council's first climate mitigation action plan. As it is implemented there will be opportunities to learn from and refine the actions proposed. Actions will be implemented where the council is financially able to do so and all opportunities for funding will be explored and utilised where possible. To ensure this plan is adaptive to new information and subject to continuous learning and improvement, a plan for monitoring and review is included below.

### Principles for developing the climate mitigation actions

In selecting priority actions for Tamworth, the following principles have been applied, following discussion with Tamworth council officers:

- Align with the wider area strategies for Staffordshire and the West Midlands
- Focus on actions within the council's control that enable the council to begin setting an example in the wider community
- Identify policies, plans and projects already happening in Tamworth
- Prioritise easy wins and low-regret actions with co-benefits where possible in the short term, acknowledging resourcing is often a barrier
- Avoid lock-in i.e. making sure any long-term decisions and strategies such as those for infrastructure and housing are compatible with net zero.

### Cross-cutting actions

Three cross-cutting actions have been identified that would benefit from cross-council implementation to maximise efficiency, take advantage of synergies and avoid siloed working. These cross-cutting actions were:

1. **Building awareness and understanding of climate mitigation action within the council** - To support implementation of the actions in this plan and support the

embedding of climate mitigation in organisation processes and decision-making, Tamworth could introduce training for staff to improve their understanding of net zero targets and decarbonisation opportunities.

**2. Embedding climate change mitigation action across relevant council policies and strategies** - If long-term policies and strategies are implemented without due consideration of net zero targets, they may prevent the council from reaching these targets. Hence, the Council should aim to develop processes to include net zero in the development of new policies and strategies, including how it could impact the objectives of the new local plan and proposed corporate plan.

**3. Avoiding risks to the net zero target from climate change** – TBC’s adaptation strategy complements this action plan by introducing a plan to enable Tamworth to reduce the negative impacts of climate change. Synergies across the mitigation action plan and the adaptation plan can be identified during implementation to ensure net zero targets are not put at risk by climate change and adaptation actions do not increase emissions.

### **Monitoring and review**

To measure progress achieved against this plan, as well as improving understanding of the impact of mitigation action for the council estate, ongoing monitoring and verification will be undertaken. This will involve updating and improving the inventory to demonstrate the effectiveness of actions taken and identifying where further action is needed or supporting cross-council learning on approaches, barriers, and opportunities to climate mitigation. Tamworth Borough Council will monitor progress against the actions in this plan and present progress annually to scrutiny committee and Cabinet. In 5 years, there will be a full review of the plans and amendments as necessary.

## 5 Climate Mitigation Actions for Tamworth

The climate mitigation actions for the council estate are listed in



Table 4 below. In addition to the action and description, the action table contains the following information:

- **Enabling action:** An enabling action is an action which does not directly result in an emissions reduction, but instead is an action which facilitates reduction. For example, installing electric vehicle (EV) charge points does not directly result in reduced emissions, but encourages and facilitates the use of EV vehicles which does result in fewer GHG emissions than internal combustion engines.
- **Key actors:** Council departments responsible for implementation. This column also includes relevant stakeholders which Tamworth Borough Council will partner with to implement the action.
- **Overall emissions reduction (%):** The reduction in GHG emissions resulting from the action as a percentage of the total 2022/23 inventory emissions. Not all actions have a direct associated emission reduction.
- **Indicative cost:** An approximate cost to implement the action. Note these costs are rough estimates and heavily assumption based so additional detailed costing should be undertaken to further support decision making.
- **Cost assumptions:** Assumptions/sources used to derive the cost estimate.
- **Timescales and key decision points:** Timescales for action implementation and commentary on key decision points.
- **Co-benefits and opportunities:** Non-climate benefits associated with the action.

Cost colour coding	Indicative cost	Timescale colour coding	Timescales and key decision points
	No/low cost (up to £10k)		Short term (1 – 3 years)
	Medium cost (£10k - £250k)		Medium term (4 – 10 years)
	High cost (£250k+)		Long term (10+ years)

Table 4: Climate mitigation actions for Tamworth Borough Council estate

Action Name	Action Description	Enabling action?	TBC Service lead and partners	% overall emissions reduction	Emission savings (tCO <sub>2</sub> e)		Indicative Cost	Cost assumptions	Timescales and key decision points	Co-benefits and opportunities
					2030	2050				
Transport										
Transport plan/ Local Cycling and Walking Infrastructure Plans	Work with Staffordshire County Council to implement the Local Cycling and Walking Infrastructure Plan (Impacts council fleet, business travel, and commuting. Commuting excluded from inventory)	Y	Staffordshire County Council, Head of Active Wellbeing	Enabling action	Enabling action – no direct saving	Enabling action – no direct saving	Low cost	SCC funded	2035	Improved relationship through partnership working Improved active travel options for staff
Active travel e.g. walking, cycling	Explore feasibility of incentive scheme or other options to drive modal shift in travel (Impacts council fleet)  Explore feasibility of an incentive scheme that rewards employees who choose low carbon business travel options (Impacts business travel)	N	Head of Active Wellbeing, HR, Planning	0.2%	3	3	Low cost  For example, £5-200 in reward vouchers per staff member Up to £2000 per year depending on the incentive	Cost is dependent on incentives chosen. Variable depending on distance travelled, staff cooperation and type of travel	2025-2028	Improved air quality, increased mental and physical health
Modal shift	Review and update TBC’s travel policy to facilitate a modal shift towards public transport e.g. could require using active travel, public	N	Policy and Planning, HR	Not modelled	Not modelled	Not modelled	Low cost to conduct review, total cost is	Review of policy requires some internal	2025-2028	Improved air quality, reduced congestion, improved health and

	transport, or Council's electric cars for travel within two miles of the office (Impacts council fleet)						dependent on the outcome of the review	officer resource		wellbeing (with active travel)
Logistic efficiencies: Fleet route optimisation	Optimise fleet routes to reduce fuel consumption (Impacts council fleet)	N	Route optimisation specialists as part of StreetScene	0.4%	8	8	Cost saving of around £4,000 between now and 2050	Assuming 3,100 litres diesel saved across whole fleet and today's diesel prices	2027	Improved air quality, reduced congestion
Demand reduction	Implement a digital-by-default policy to reduce business travel frequency	N	Council Staff	Estimated <1%	Not modelled	Not modelled	No cost	-	2025-2028	Improved air quality, improved health and wellbeing, reduced congestion
Electrification of the fleet	Transition the council fleet to electric vehicles	N	Operational services	8%	36	143	£25-50K per van	Fleet size currently 26. Total price of action depends on changes to fleet size as well as percentage of fleet that is to be upgraded	2028 – 2040 6 vehicles out of 26 already procured. Assumed 25% fleet is converted to EVs at each contract renewal, the next of which will be in 2028	Improved air quality

Install electric charging points	As part of our EV strategy, perform a feasibility study to determine viable locations for EV charge points. (Impacts business travel and commuting. Commuting is excluded from baseline)	Y	Electric Vehicle Project Manager, Staffordshire County Council	Enabling action	Enabling action – no direct saving	Enabling action – no direct saving	No costs – already funded by the LEVI funding and costs to be absorbed by the ChargePoint provider e.g. BP Pulse	£4,588,000 as per the share of the LEVI funding	Changes in EV technology will impact the timeline	Improving air quality
Switch to biofuels or electric for green spaces vehicles and machinery	Implement HVO fuelling or electric to all suitable highways vehicles, plant, machinery and equipment (Impacts green space vehicles and machinery)	N	Operational Services Manager	2%	40	40	Diesel - £1.10-£1.30 per litre HVO- £1.20-£1.40 per litre <sup>13</sup> Electric (public charging point, car) £0.74 per kWh <sup>14</sup>  Electric lawnmower (1000w) £0.22 per kWh <sup>15</sup>	There may be regional price differences based on location, tariffs, distribution and the scale of the supplier. Price/kWh to charge a vehicle depends on size of vehicle, size of charger and energy tariff. To calculate: (No. litres to fill the tank or no. of kWh to	2026	Improved air quality Less noise pollution

<https://heatlab.co.uk/boiler-advice/how-much-energy-do-appliances-use>

								charge the vehicle) * (price per litre or price per kWh)		
<b>Streetlighting and road infrastructure</b>										
LED conversion of all remaining non-LED lighting columns	This action replaces all remaining non-LED streetlights with LEDs. It is understood that an LED conversion programme has already commenced, so this action represents a continuation and completion of this work	N	Roads and transport, Staffordshire County Council, Highways England	4%	27	1	Awaiting costs that have already been worked out for streetlighting from the council	47,000 non-LED streetlights still to be upgraded	Already underway, may take another two years (2026)	Reduced energy consumption, reduced noise pollution
Reduce electricity demand of other road assets	Reduce electricity consumption of road infrastructure such as car park barriers and street signs through LED lighting and high-efficiency alternatives	N	Roads and transport, Staffordshire County Council	2%	11	1	Initial resource for feasibility study likely to be low but capital costs for implementation unknown	Case study of indicative savings - Sustainable energy authority of Ireland changed to LED lighting in a multi storey carpark which saved roughly €18,000 a year <sup>16</sup>		Reduced energy consumption
<b>Buildings</b>										
Further audit analysis	Conduct further audits on high priority buildings e.g. sheltered housing, to gain	Y	Assets	Enabling action	Enabling action –	Enabling action –	£2-5k per building	Cost is dependent on building	2025 - 2028	Co-benefit not identified

[Lighting Upgrade at Cavay Multi-Storey Car Park | Case Studies | SEMI](#)

	insight into potential improvement areas				no direct saving	no direct saving		type, e.g. housing will be cheaper due to size		
Use audit results to build business case for improvements	Review outcomes of energy audits and establish a scheduled programme of works for building energy upgrades (Impacts all buildings)	Y	Assets	Enabling action	Enabling action – no direct saving	Enabling action – no direct saving	Low	Some officer resource required for review	2025 - 2030	Co-benefit not identified
Council Housing: Implement a housing stock condition and asset management strategy	Implement a housing stock condition and asset management strategy with integrated mitigation and adaptation aims	Y	Neighbourhoods, Assets	Enabling action	Enabling action – no direct saving	Enabling action – no direct saving	Approximately £5K-£25K	Assuming approximate costs to procure consultancy services, cost of this action would vary depending on detail of survey as well as technology used	2025 - 2030	Potential for improved health and wellbeing of residents.
All buildings: Improve electricity efficiency of daily operations	This involves optimising operations by replacing equipment that may result in high electricity consumption, due to inefficiencies rather than use e.g. ventilation, cooking equipment, lift/escalators, space heating, installing LEDs, motion detecting/proximity detector light switches in	N	Property and Facilities Management (Energy)	1%	12	1	In the range of £5-10k for Anker Valley Sports Complex and the Town Hall, to ~£100k for Marmion House.	Estimate based on detailed cost analysis for audited buildings <sup>17</sup> . Cost varies widely depending on characteristics of buildings.	2026-2035	Reduced energy bills

	communal areas, heat sensors									
All buildings: Building optimisation	Use of building management and monitoring systems, such as voltage optimisation or using sensors and sub-metering to understand and control when and where energy is currently being used	Y	Property and Facilities Management (Energy)	2%	6	17	Ranging from about £50k-250k depending on the building (highest for Marmion House)	Based on detailed cost analysis for audited buildings <sup>18</sup>	2026-2035	Reduced energy bills
Council Housing: Review impact of receiving Social Housing Decarbonisation Funding	Review impact of receiving funding from the Social Housing Decarbonisation Fund (SHDF) as a way of providing increased insulation to housing and as a mechanism of introducing renewable heating systems	Y	Assets	Enabling action	Enabling action – no direct saving	Enabling action – no direct saving	Low	Some officer resource required for review	2028	Possible health and wellbeing benefits for residents if housing upgrades are implemented.
Council Buildings (excluding housing): Heating systems and insulation upgrades, retrofitting measures	Upgrade heating and insulation to reduce gas consumption, through zonal heating, cavity wall or solid wall insulation, double glazing where lacking, roof insulation, insulation of heating pipes, and draft-proofing	N	Property and Facilities Management (Energy)	9%	23	159	From ~£80k for Anker Valley Sports Complex to ~£900k for Marmion House.	Estimate based on detailed cost analysis for audited buildings <sup>19</sup> . Cost varies widely depending on building characteristics.	2026-2035	Building a green, low carbon economy, improved health and wellbeing
Council Housing: Heating systems and	Phase 1 – Conduct a feasibility Study for	N	Property and Facilities	Modelled in combinati	53	355	Low cost for initial	Cost to retrofit is ~£300/m <sup>2</sup>	2026 - 2050	Building a green, low carbon

buildings audited

insulation upgrades, retrofitting measures	further upgrades to heating and insulation to reduce gas consumption, through zonal heating, cavity wall or solid wall insulation, double glazing where lacking, roof insulation, insulation of heating pipes, and draft-proofing Phase 2 - Implement if feasible		Management (Energy)	on with the below			feasibility study  Medium cost for implementation	(~£20k to retrofit a dwelling <sup>20</sup> and typical floor area of social housing is ~67 m <sup>2</sup> <sup>21</sup> ). Scaled to floor area of TBC's social housing <sup>22</sup>		economy, improved health and wellbeing
All buildings: Switch heating from gas to zero direct emission heating (ZDEH) systems	Phase 1 - Conduct a feasibility study around switching heating from gas boilers to heat pumps, air source, ground source, district heat networks or electric heating. It is essential that fabric measures - heating and insulation upgrades - are delivered first where needed for heat pumps to be effective  Phase 2 - make the switch based on the review	N	Property and Facilities Management (Energy)	20%	76	514	Low cost for feasibility study. From ~£25k for the castle to ~£450K for Marmion House for implementation (based on audited buildings)	Estimate based on detailed cost analysis for audited buildings <sup>23</sup> . These costs depend on factors like property size, system complexity, and installation conditions.	2026-2050 Review by 2026, Take action before 2035	Building a green, low carbon economy
Increase deployment of renewables on council buildings	Phase 1 - Conduct feasibility studies to determine the potential for installation of (additional) renewables  Phase 2 - Initiate renewable energy generation where feasible.	N	Assets	~41,000 kWh generation potential across audited buildings	6	1	Low cost for feasibility study. Medium to high costs for phase two	Initial feasibility work already carried out and recorded in Net Zero Tamworth	2026	Building a green, low carbon economy

buildings audited



							depending on scope.	Energy Audit report.		
<b>Waste</b>										
Municipal Waste: Reduce mileage of waste vehicle fleet	Conduct route optimisation analysis (including relocating of the waste depot) to reduce distance travelled	N	Procurement Services, Lichfield District Council, AD for Environment and Wellbeing	2%	36	36	Costing depends heavily on if the work is outsourced to a fleet specialist or if software is purchased by council and done internally	A fleet specialist or software can be used for personal routing and scheduling, but it must account for real-time traffic, as routes need to remain flexible beyond initial planning.	2025-2028	Improved air quality, reduction congestion
Municipal Waste: ULEV waste vehicles	Replace waste collection vehicles to be Ultra Low Emission Vehicles (ULEVs) in collaboration with Staffordshire's Joint Waste Management Board	N	Procurement Services, Lichfield District Council, AD for Environment and Wellbeing	23%	Actioned after 2030	285	Estimated £300-400K per vehicle <sup>24</sup>	Depends on supplier and number of vehicles chosen to be upgraded, more information needed for accurate costing	2040	Improved air quality
<b>Renewables</b>										
Explore options for using 100% renewable electricity on council owned land assets	Phase 1: Track the gov. decarbonisation plans, but review potential for heat pump installation before this	N	Assets	This depends on how many systems	Depends on how many systems	Depends on how many systems	Cost varies depending on grid decarbonisation	Based on available sites and land as well as the timing	2025-2028	Provision of skills and green jobs, potential for energy projects that

	<p>Phase 2: Decide how to progress if the grid decarb is not likely, this includes Change to renewable electricity through either the installation of renewable energy systems or adoption of a renewable tariff.</p> <p>This could be achieved in various ways, with different costs to the Council:</p> <ul style="list-style-type: none"> <li>In future, if the electricity grid is net zero, this will be achieved by default. However, the timing of this is uncertain</li> <li>Deliver additional renewables on Council-owned buildings and land or other nearby locations</li> </ul>			switch to electricity as part of other mitigation measures. The estimated reduction would be in the region of 40%.	switch to electric.	switch to electric.	Refer to building audit to explore the possibility, review in 5 years to make decisions.	of the national grid reaching net zero. In future, if the electricity grid is net zero, this will be achieved by default. Cost is heavily dependent on available sites/land and there could be potential savings if private wire arrangements were feasible.		benefit the local community directly
<b>Supply chain and communications</b>										
Develop a communication strategy	<p>Develop an internal communication strategy which includes:</p> <ul style="list-style-type: none"> <li>Ban of unnecessary single use plastics in council buildings</li> <li>Resource efficiency and staff awareness</li> <li>Reduction in food waste for events and meetings</li> </ul>	Y	Comms. Climate Change	Not modelled	Enabling action – no direct saving	Enabling action – no direct saving	Low	Cost depends on the extent of the rollout campaign	2025-2028	Co-benefits not identified.

	<ul style="list-style-type: none"> <li>Encouraging active and/or low carbon travel when commuting</li> </ul> <p>Develop an external communication strategy which includes:</p> <ul style="list-style-type: none"> <li>Awareness raising of reduce, reuse, recycling principles</li> <li>Reduction in food waste</li> </ul>									
Review potential for partnership collaboration on Borough-wide GHG reduction	Review partnerships and identify the potential to work together on reducing GHG emissions in the wider Borough	Y	Partnerships	Not modelled	Enabling action – no direct saving	Enabling action – no direct saving	Not quantified	Cost depends on campaigns agreed with partners	2025 - 2050	Co-benefits not identified.
Build carbon reductions into 'invitations to tender'	Produce tender specifications that contain requirements for suppliers to show commitment to reducing their environmental impact	N	Procurement Services	Not modelled	Not modelled	Not modelled	Not quantified	Small resource required for procurement team to implement	2025 – 2028	Co-benefits not identified
Update repair contracts	Ask suppliers to evidence use of more sustainable materials	N	Assets	Not modelled	Not modelled	Not modelled	Not quantified	Small resource required for procurement team to implement	2025 - 2028	Circular economy development, sustainable consumption of resources, job creation
Update energy contract	Stipulate that the new contract must prioritise electricity generated from renewable sources across all	N	Procurement Services	Not modelled	Not modelled	Not modelled	Approx. £3K per year to switch to renewable	Small cost to make change the energy contract in	2025 - 2028	Co-benefits not identified

	operational buildings and housing where applicable.						energy tariff for Marmion House	Marmion House. Small resource required for procurement team to implement		
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Whilst commuting emissions are not included within the inventory, there are still actions Tamworth Borough Council could take to encourage greenhouse gas emissions from this source:

- **Cycle to work scheme:** This action is split into two phases. Phase 1: conduct review of eligibility and conduct a Staff Travel survey to understand the appetite for cycle to work and the barriers. Phase 2: If feasible, introduce a Cycle to Work scheme for eligible council employees to acquire a new bike
- **Promotion of active travel to work strategy:** Continue to promote an active travel to work strategy. This may include encouraging leaving the car at home as least one day a week and encouraging car sharing
- **Public transport discount scheme for Council employees:** Explore the possibility of a public transport discount scheme for Council employees. For example, there is existing precedent such as Transport for Greater Manchester offering corporate travel scheme

## 6 Modelled pathway to net zero

This section outlines the potential emissions savings associated with the majority of climate actions listed in **section 5** above.

The following two emissions pathways have been developed to show TBC's potential future emissions:

- **Modelled reduction scenario:** Potential future emissions if the actions contained within the action plan are implemented.
- **Business as usual (BAU) scenario:** Baseline future emissions if no climate action is taken beyond UK grid decarbonisation, provided for comparison.

### Modelling approach

The calculation of GHG emission pathways for the Council has been undertaken using the Carbon Scenario Model (CSM). Originally developed for use by local authorities (funded by Resource Efficient Scotland and Sustainable Scotland Network<sup>25</sup>), this Excel-based tool has been adapted by the project team to provide a bespoke modelling solution for TBC.

Within the model, baseline emissions are disaggregated by sector (e.g. buildings, vehicles, waste) and by fuel type (e.g. electricity, gas, petrol). The model is then configured to specify whether each source of emissions will increase or decrease, and by how much. Under the BAU scenario, the only impact modelled is future UK grid decarbonisation. Changes in the modelled reduction scenario are due to GHG reduction actions and policies. In each case, the scale of the impact is informed by an evidence base that includes stakeholder engagement, literature and policy reviews.

The model is then configured to specify the timeframe over which the changes occur, or the actions are implemented. Based on all of this information, the model recalculates emissions for each sector and fuel type for each year up until the target date. The modelling does not account for a change in the council's assets, for example the selling of Marmion House.

This analysis allows us to evaluate how close TBC could get towards achieving its target, assess the scale of impact from individual GHG reduction measures, and identify any sectors where there is a shortfall. The results can then be used as an evidence base to prioritise actions and identify key risks.

However, it is important to understand that these are illustrative scenarios based on assumptions and not projections or predictions. **Any estimates of future emissions – particularly ones that extend decades into the future – are associated with significant uncertainty and subject to adjustments as the evidence base improves and unforeseen technology and behaviour changes arise.**

### Business as usual scenario

The base year GHG inventory is projected forward in time, assuming no further action is taken by the Council, to produce the Business as Usual (BAU) scenario.

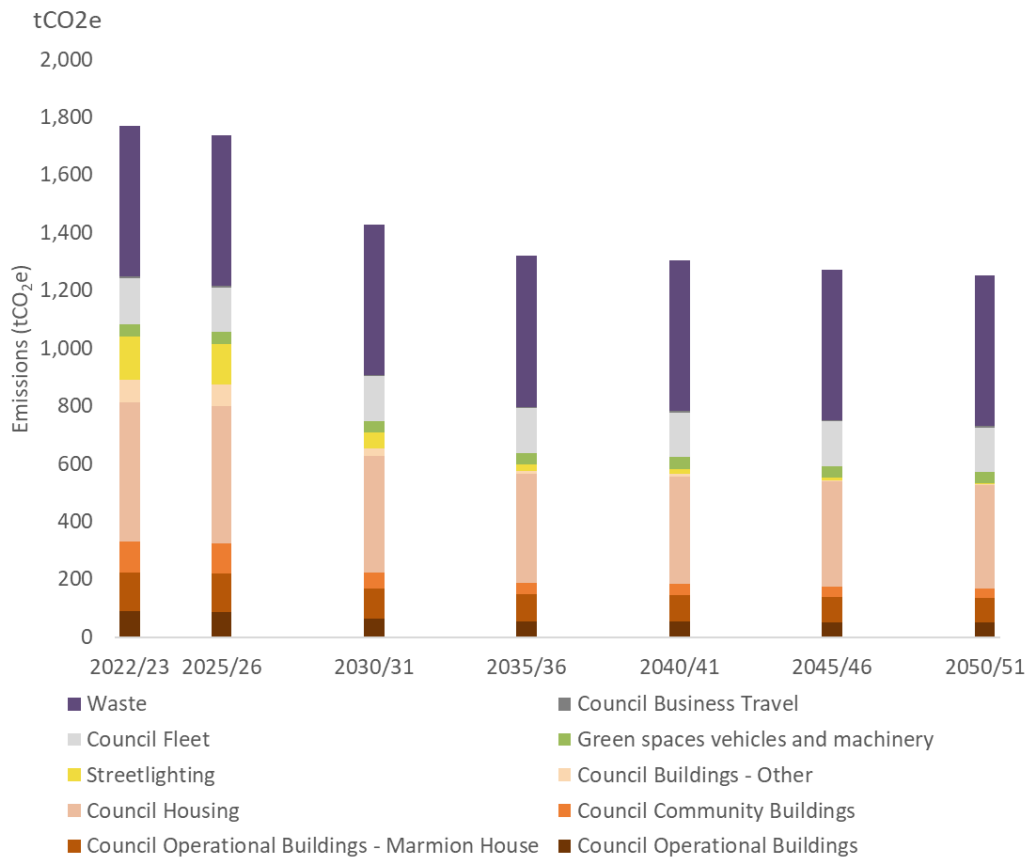
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<sup>25</sup> <https://sustainablesotlandnetwork.org/resources/carbon-footprint-and-project-register-tool>

The key change that has been modelled is the decrease in emissions from grid electricity, which is due to a higher proportion of renewables used to generate power. The future grid electricity factors used in the model are based on the Treasury Green Book supplementary appraisal guidance on valuing energy use and greenhouse gas (GHG) emissions<sup>26</sup>.

Under the BAU, emissions reduce from 1,769 tCO<sub>2</sub>e in 2022/23 to 1,429 in 2030/31 (19% reduction) and reach 1,252 tCO<sub>2</sub>e by 2050 (29% reduction).

Figure 4: Projected emissions for Tamworth Borough Council under a Business as Usual scenario, 2022/23- 2050/51



It is important to note that the future emission factors for electricity are *not* forecasts of what will actually happen. The Treasury Green Book figures represent the changes that would need to happen for the UK to meet its carbon targets. Achieving this will require very significant investment in infrastructure and a step change in renewable energy deployment and battery storage. The values cited above are therefore an optimistic estimate of the GHG reduction that could occur in the BAU scenario.

### Modelled reduction scenario

The modelled reduction scenario incorporates the same grid electricity trend as the BAU scenario. Individual GHG reduction actions are added with emissions savings estimated

<sup>26</sup> The year-on-year change in Treasury Green Book values was used to calculate the carbon emission factor for electricity to the year 2045:  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/794737/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794737/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal-2018.pdf)

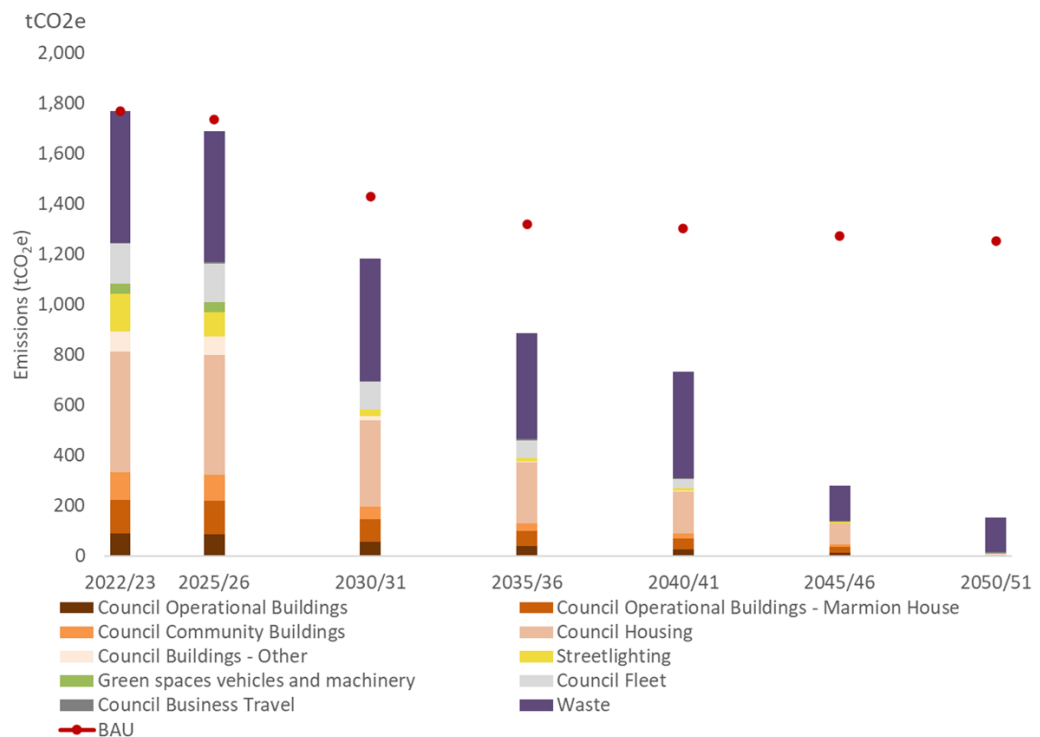
annually from the year of implementation. The list of actions made for the modelling are outlined in the action table in **section 5**.

In March 2024, Mesh Projects Limited performed an in-person, non-intrusive survey on nine operational and community council buildings. The purpose of this was to understand the current quality of the building stock and to understand what opportunities are available to implement low carbon retrofits. The outcomes of this are presented in the separate report, ‘Tamworth Net Zero Energy Audit Report’.

The report contains recommendations on different mitigation actions for each building, covering monitoring & management, fabric upgrades, hot water system and heating, ventilation and air conditioning upgrades, lighting upgrades, heat decarbonisation and renewable electricity generation and storage. The associated average energy savings from operational and community buildings were applied to the wider estate to estimate emission savings in the modelled reduction scenario.

The results of the emissions pathway show that emissions reduce from 1,769 tCO<sub>2</sub>e in 2022/23 to 245 tCO<sub>2</sub>e in 2050/51, a reduction of 87% (**Figure 5**). The largest reductions are due to the decarbonisation of council buildings, particularly council housing. In 2050, it is projected that there will remain emissions related to homeworking which the council has limited control over, and waste. As emissions under this scenario are not projected to reach zero by 2050, Tamworth Borough Council would need to offset any remaining emissions to reach net zero under this scenario.

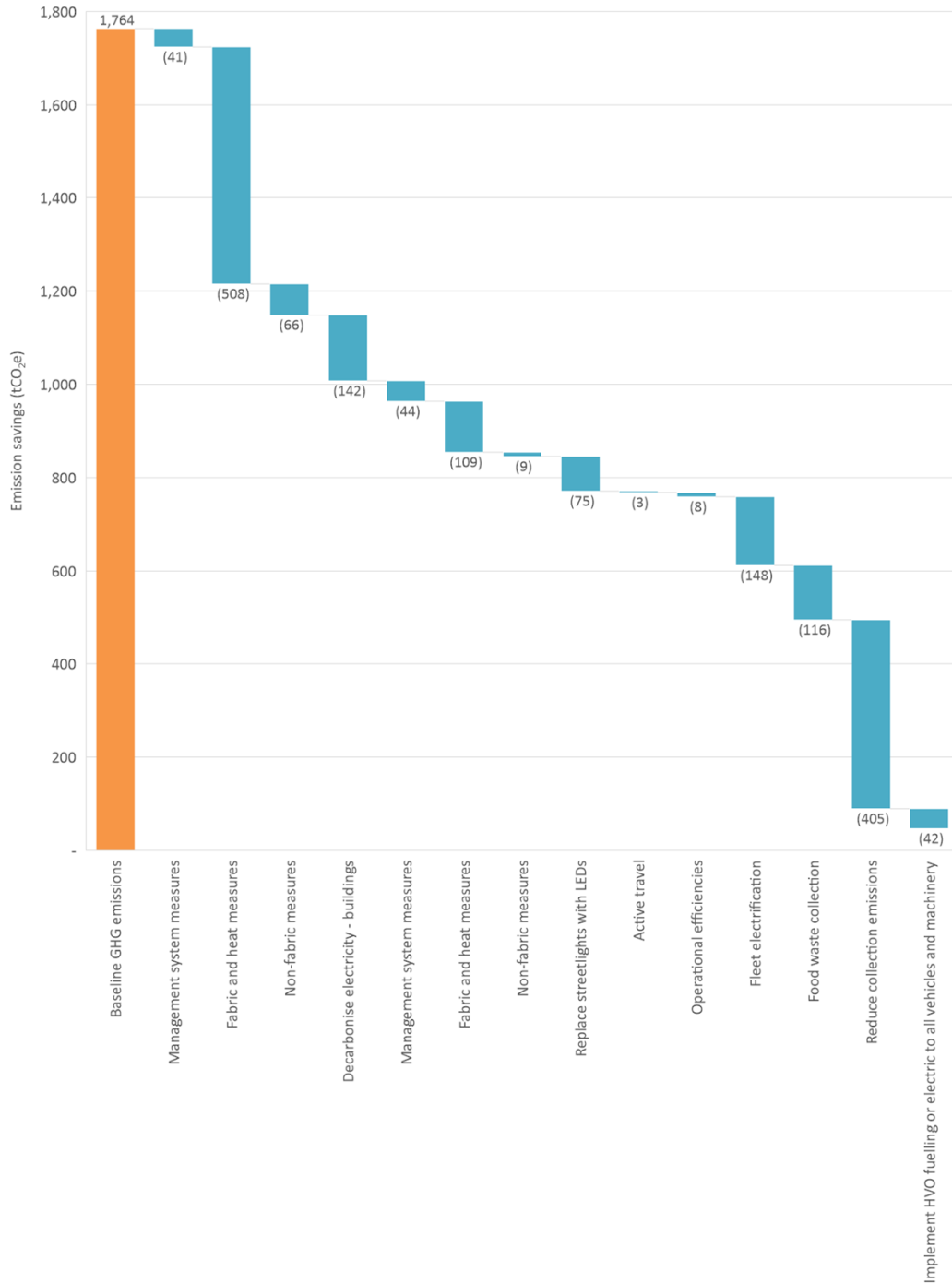
Figure 5: Modelled reduction scenario for Tamworth Borough Council, 2022/23 – 2050/51



### Impact of mitigation actions

The waterfall chart in **Figure 6** illustrates the relative scale of impact from individual mitigation actions. As explained previously, some of these assumptions are based on future technologies, so this is a theoretical pathway towards net zero. However, it is still helpful to visualise the potential effects of different measures, and where any residual emissions are likely to come from.

Figure 6: Waterfall chart showing emission savings from mitigation actions



Out of the mitigation measures modelled, improving the **building** fabric and switching to zero direct emission heating (ZDEH) systems, and then supplying renewable electricity, has the biggest impact. Energy use, and associated bills, can be reduced via retrofitting



energy efficiency measures, but this has a much smaller impact on GHG emissions than switching heating systems – and retrofitting alone is not enough to get buildings to net zero.

Decarbonising the council's buildings will require significant investment. Detailed cost analysis on the nine audited buildings identified total capital expenditure (CAPEX) costs of £3.2 million, and Net Present Value (NPV) of £2 million. Further audit analysis will be needed to more accurately estimate costs for remaining council buildings, but the capital cost is expected to be on the order of tens of millions.

**Streetlighting** currently accounts for 8% of the GHG emissions that have been quantified. As is the case for buildings, supplying these with zero carbon electricity, either from a decarbonised electricity grid or Council-owned renewable energy installation, would mitigate this source of emissions. There will also be energy savings resulting from the ongoing initiative to switch to LEDs.

The Council's **vehicle fleet** currently comprises 9% of the quantified GHG emissions. We have assumed that using active travel for short journeys and optimising fleet routes to reduce fuel consumption reduce vehicle fleet emissions by 2% and 5%, respectively. Remaining emissions are reduced due to electrification, which we have assumed will take place across four phases starting in 2028, each of which is four years long, to align with the current contract renewal cycle. The cost to purchase electric fleet is estimated to be £25,000 - £50,000 per van.

**Green spaces and machinery** switch to an equal mix of electric or biofuel-powered, resulting in almost complete decarbonisation.

Emissions from **waste** account for roughly 29% of the total. This is one of the most challenging sources of emissions for Tamworth (and other local authorities) to address.

Recognising these technical and practical barriers, the Council's options for reducing its waste emissions are:

- Reducing the amount of waste that is generated in the first place;
- Reintroducing a food waste collection service;
- Increasing recycling and composting rates; and
- Work with Lichfield District Council to produce electric waste collection vehicles

## 7 Conclusions

Tamworth Borough Council declared a climate emergency in 2019 and set a target for its estate to reach net zero carbon by 2050, or sooner if financially able to do so.

To provide the necessary evidence base to meet this goal, an updated greenhouse gas inventory has been compiled for the 2019/20 – 2022/23 financial years. Tamworth Borough Council's GHG emissions for 2022/2023 were estimated to be 1,769 tCO<sub>2</sub>e. the largest sources of emissions were council waste collection (29%) and council housing (27%). The methodologies for calculating emissions from procurement activities and commuting are not well established and have a high uncertainty and therefore these emissions have been presented separately.

The inventory has been used to inform Tamworth's net zero action plan. This plan contains actions for decarbonising the council estate and services across the areas of: council fleet, business travel, commuting, streetlighting and road infrastructure, buildings, waste, homeworking, renewables and supply chains and communications. The plan identifies indicative costs, key actors and timescales and key decision points so that the council can make informed decisions about how and when to implement actions on their journey to net zero.

To illustrate the potential impact of this action plan on council emissions, a modelled emissions reduction pathway has been estimated. This shows one potential route to net zero for the council and can be compared with a business as usual scenario where no further action is taken by Tamworth Borough Council. The business as usual scenario estimates only a 29% reduction in TBC's emissions by 2050, due to decarbonisation of the national electricity system, illustrating the importance of action to drive significant cuts in Tamworth's emissions over the coming decades.

## Appendix 1: Inventory Methodology

A GHG inventory is a dataset which presents estimates of emissions of various greenhouse gases from a wide range of activities in an organisation, country or other geographical area. The standard approach to estimate GHG emissions is by multiplying activity data by an emission factor associated with the activity being measured (**Equation 1**).

*Equation 1: Emission factor approach for calculating GHG emissions.*

GHG emissions = activity data \* emission factor

**Emission Factor** - This is the emissions per unit of activity, which usually comes from scientific literature. It is typically derived from measurement.

**Activity data** - This is a measure or estimate of the activity which is taking place, such as number of cows or tonnes of fuel. This data typically comes from national statistical datasets or from the organisation in question, in this case Tamworth Borough Council.

For example, estimating CO<sub>2</sub> emissions from the use of electricity involves multiplying data on kilowatt-hours (kWh) of electricity used by the emission factor (kgCO<sub>2</sub>/kWh) for electricity, which will depend on the technology and type of fuel used to generate the electricity.

A GHG inventory Excel tool has been developed to contain the GHG inventory for the Council. Data sources are fully referenced in the calculations and within a 'How To Update' sheet in the workbook. This contains step-by-step instructions on how Council officers can update the inventories annually in the future.

### Operational scope of Tamworth Borough Council's GHG inventory

When reporting emissions, it is important to consider which sources to include. The Greenhouse Gas Protocol<sup>27</sup> provides a widely used set of standards which describe emission sources and “**scopes**” which should be considered as part of a local carbon accounting process. Scopes help determine which emissions an organisation has the most control over.

- **Scope 1 emissions** are GHG emissions from sources owned or controlled by Tamworth e.g. Burning fossil fuels (gas) to provide heating for owned buildings e.g. Marmion House
- **Scope 2 emissions** are GHG emissions from the consumption of purchased electricity, steam or other sources of grid-generated energy e.g. Electricity used at owned buildings (Marmion House) but are generated elsewhere.
- **Scope 3 emissions** occur indirectly from TBC's activities across the supply chain e.g. Emissions from water or waste treatment, which happen elsewhere and are outsourced to a third party.

For TBC, the following sources of emissions were considered in scope, as detailed in

Table 5.

<sup>27</sup> [https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard\\_041613\\_2.pdf](https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf)

Table 5: Emission sources included in the TBC inventory, categorised by scope

Scope 1	Scope 2	Scope 3
Council owned buildings: operational and community buildings: (natural gas)	Council owned buildings: operational and community buildings: (electricity)	Working from home
Council owned/ run housing: sheltered, and communal areas of council owned non-sheltered housing (council, private tenants, private owners): (natural gas)	Council owned/ run housing: sheltered, and communal areas of council owned non-sheltered housing (council, private tenants, private owners): (electricity)	Business travel
Council fleet (petrol and diesel)	Council fleet (electricity)	Procurement (goods and services)
Council waste collection and disposal (waste processing not in scope)	Streetlighting	Commuting
Green spaces and machinery		

The **geographical boundary** for TBC’s GHG inventory is the area covered by the Council administrative area. Emissions from the Council’s own assets and activities are included and calculated as a subset of those emissions.

**Emissions excluded from the operational scope**

Emission sources classified as out of scope for the TBC GHG inventory include:

- Privately owned/managed sheltered housing and care homes;
- Non-operational leased buildings;
- Highway maintenance;
- Leased assets;
- Leisure facilities;
- Housing placement in private rented sector funded by the council (temporary accommodation) and;
- Individual tenants use of heat in council housing.



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