

WILTSHIRE COUNCIL

Wiltshire Council Carbon Emissions Baseline and Reduction Pathways

Version 1.3

May 2022





Anthesis is the Sustainability **Activator**.

We are the largest group of dedicated sustainability experts in the world: a team of 500+ people, working across seventeen countries, to serve more than 800 clients. We exist to shape a more productive and resilient world by helping organisations transition to new models of sustainable performance. Our team combines broad and deep sustainability expertise with the commercial and operational capabilities it takes to conceive and deliver real change.

Our work with local authorities

Anthesis has significant experience supporting local authorities who have declared a climate emergency and are working towards meeting their carbon reduction goals. Our work includes:

SCATTER: We are the developers of the SCATTER tool (Setting City Area Targets and Trajectories for Emissions Reduction), a free to use tool for UK local authorities. This provides a current GHG baseline for area-wide emissions and models different trajectories for emissions reduction to 2050.

Project Carbon Impact Assessment Tool: Anthesis, in partnership with two local authorities, has developed an assessment tool to measure the emissions reductions associated with different low-carbon projects. This helps quantify the carbon impact of both capital and revenue projects and helps better embed the financial cost of carbon within decision-making.

Authority Based Insetting: Anthesis is leading a consortium of local authorities to develop a framework supporting the implementation of carbon-saving projects locally. This will help local authorities meet their net-zero targets, stimulate greater investment in the borough, and increase collaboration between stakeholders.



EXECUTIVE SUMMARY

Wiltshire's Climate Change Commitment

In February 2019, Wiltshire Council acknowledged the climate emergency and committed to becoming a carbon neutral organisation by 2030. The council has already reduced its emissions by 80% through the Carbon Management Plan (2013). The 2022-27 [Climate Strategy](#) sets out a framework for reducing emissions across Wiltshire over the next 5 years, including achieving a carbon neutral council.

This report has been commissioned to outline a pathway to carbon neutrality for the council's own emissions, demonstrating *what* needs to be achieved. This should inform the council's next steps, including development of a plan outlining *how* the council will get there. The council's carbon neutral commitment is focused on emissions in the organisation's direct control (i.e. Scope 1 & 2), but the council has also committed to better understanding those outside of its direct control (Scope 3). These emissions are also explored in this report but are not included in the pathways analysis.

Emissions Analysis

Wiltshire Council's emissions in 2020/21 total 9,368 tCO₂e (see Figure a). 48% of emissions are categorised under Scope 1, meaning they are associated with direct gas and liquid fuel consumption by the council. The remaining emissions are associated with the council's purchased electricity (Scope 2) for consumption in buildings and streetlighting. Since April 2020, Wiltshire Council has purchased its electricity under a green tariff agreement. This means that under a "market-based" approach to emissions reporting, the council's Scope 2 emissions are zero, but both are presented here in line with best practice.

Emissions associated with some activities outside the council's direct control (Scope 3) were also estimated, but not included in the pathways analysis. This includes the impact of schools, staff travel, and most significantly, council suppliers. Emissions from Scope 3 activities are much larger than those from Scope 1 & 2.

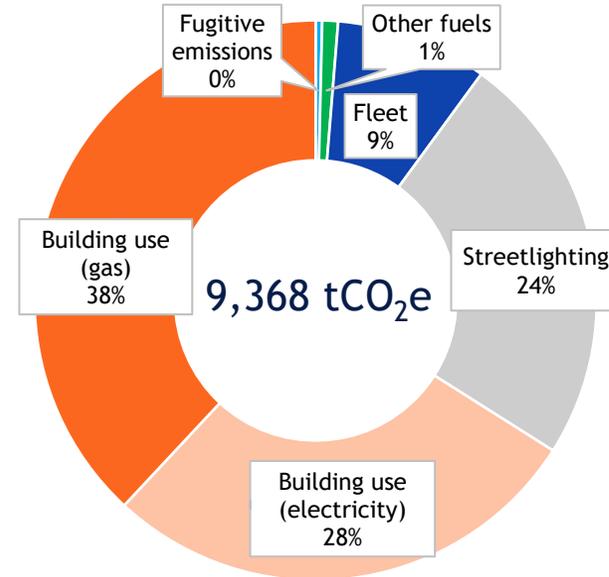


Figure a: Wiltshire Council's Scope 1 & 2 footprint 2020/21, calculated using a location-based approach. A market-based approach treats emissions from streetlighting and electricity use in buildings as zero on account of the council's green tariff.

Data Recommendations

The council's footprint should continue to be updated at least annually. This enables tracking the progress of your decarbonisation initiatives. We provide the following recommendations for future reporting:

- **Reassess activities inside the operational boundary each year:** The boundary applied in the baseline covers all data in the council's Local Government Association (LGA) reported footprint. In future reporting, the council should continue to assess the limits of its ownership and influence (i.e. its "operational boundary"), and apply this principle consistently, to ensure accuracy in reporting
- **Report Scope 2 emissions on both a market and location basis** in line with Greenhouse Gas Protocol guidance
- **Improve data visibility on Scope 3 operations** through engagement with suppliers

EXECUTIVE SUMMARY

Emissions Reduction Pathways Results

Figure b shows the outputs of the emissions pathways analysis for the council. This is based on a combination of both recently recorded emissions reduction activities and potential new projects, focused on the council’s buildings and fleet.

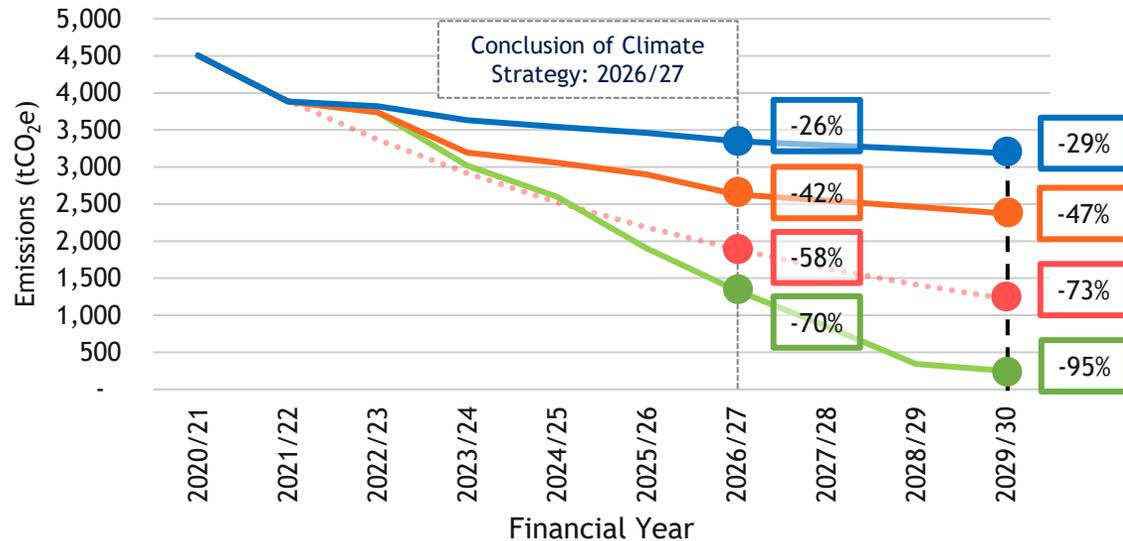


Figure b: Emissions reduction pathways for Wiltshire council

- Business-as-usual (BAU):** Buildings: Assumes the council delivers only projects that are currently in delivery stages (as at the end of 2022) or have been completed since the 2020/21 baseline. Transport: Assumes the council replaces all “smaller” vehicles with electric vehicles (EV).
- Pipeline:** Buildings: Assumes the council delivers projects that are currently in delivery as well as those that are in planning, fundraising and application stages. Transport: Assumes the council replaces all “small” and “medium” vehicles with EV, with HGVs on biofuels.
- Stretch:** Buildings: Assumes the council successfully delivers all pipeline projects as well as the longlist of potential projects identified in Phase 1 of the Corporate Carbon Reduction Programme and additional behaviour change and heating technology retrofits. Transport: Assumes all vehicles replaced by EV.
- Paris-aligned carbon budget:** Annual reduction rate for area-wide carbon budget, applied to council’s own emissions.

Reaching Carbon Neutral

The total cost of delivery for the measures included in the Stretch pathway for buildings and transport is estimated to be over £29 million*, with a payback period of 10-15 years. Figure b shows that even with application of the comprehensive package of carbon reduction actions outlined in the Stretch scenario, around 5% of emissions remain (equivalent to 224tCO₂e). The council may choose to apply the principles of carbon offsetting to address these “residual” emissions. Varying approaches to offsetting could be applied by the council:

- Market based offsets:** Purchasing verified UK carbon credits. *Annual* cost of credits in 2030 are likely to reach the scale of >£0.1m and this figure is likely to increase significantly over time.
- Nature-based solutions:** Delivery of local nature-based offsetting projects by the council, such as tree planting initiatives. We estimate the required minimum range of planted area to be 0.88-9km². These would need to be planted in 2024 in order to offset all the residual emissions by 2030. With government subsidies, this could be delivered at a capital cost of £0.75-7.65m, excluding land purchases.
- “Insetting” projects:** The council could financially support delivery of carbon reduction or avoidance projects within the county and claim carbon savings.

These approaches are not mutually exclusive, and the council may choose to apply more than one. However, local authorities have experienced challenges justifying purchase of market based offsets, and the application of the latter options is recommended.

Recommendations

- **Continue to strengthen monitoring and reporting practices** by implementing guidance set out in this report.
- **Translate plans into discrete actions;** the council is now equipped to design a delivery plan for low carbon projects. This should involve officers from across the council and prioritise heating system retrofits and energy demand reduction.
- **Communicate clearly on residual emissions** through an offsetting strategy.

*cost of refuse collection vehicle replacement has been excluded; but has been estimated in the region of £80m.

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01 Background & Context



1. BACKGROUND & CONTEXT

INTRODUCTION

Overview & Scope

In 2019, Wiltshire Council committed to becoming a carbon neutral organisation by 2030. This target is focused on those emissions within the council's direct control.

This report has been commissioned to provide a roadmap towards carbon neutrality by 2030, building on reductions achieved through the Council's 2013 Carbon Management Plan, and defining what more needs to be done to achieve the target. This report also considers the council's pledge to work to understand and reduce emissions associated with its activities but occurring outside its own operations (Scope 3 emissions). The report is structured as follows:

- **Chapter 1** introduces this work and the key contexts around the council's 2030 carbon neutral target for its own operations
- **Chapter 2** reviews the council's current emissions profile and offers recommendations on improving the data quality and footprinting process for future assessments
- **Chapter 3** shows future emissions pathways for the council based on programmes of activity across its estate and fleet
- **Chapter 4** discusses what is required in terms of investment and *closing the gap* of residual emissions in order to reach carbon neutrality by 2030
- **Chapter 5** summarises our recommendations and next steps for the council

Engagement

Anthesis engaged stakeholders at Wiltshire Council at several milestones during the research process, including through a data request form, and in workshops, to build a more complete picture of local factors and action already taken by the council.

Objectives

- Review and profile Wiltshire Council's direct emissions using existing baseline data held by the council. Set a baseline against which future reductions can be measured.
- Provide a high-level estimate of the council's Scope 3 emissions.
- Produce a roadmap to carbon neutrality for the council. Outline the technological interventions needed in order to achieve this pathway, and the associated carbon reductions, costs and savings of different activities.
- Provide recommendations on a suitable approach to offsetting for any residual emissions not addressed by the interventions modelled.

The data provided in this report highlights the scale and speed of change needed across Wiltshire Council to achieve carbon neutrality for the organisation.

This helps the council by:

- Providing an evidence base against which the council can build a Carbon Neutral Plan for its own operations, highlighting which technological opportunities are most impactful and hold local potential for implementation.
- Helping to build the business case for climate action within the council, by beginning conversations on the potential costs and opportunities of delivering carbon neutrality for the council.

1. BACKGROUND & CONTEXT

A CALL TO ACTION

A Growing Consensus

Climate change poses an unprecedented threat to humanity, and action to mitigate this threat is required across all aspects of society.

Most recently, this was communicated by the Intergovernmental Panel on Climate Change's (IPCC) [Sixth Assessment Report](#), which states that 1.5°C of warming is now unavoidable, but that strong action can still limit climate change, and with radical action, temperatures could stabilise in 20-30 years. The recognition of urgency is being reiterated across a variety of sectors:

- **UK Local Authorities:** The majority of Local Authorities in the UK have now declared a climate emergency or a motion on climate change. [85% of councils](#) now have a climate plan. Wiltshire's commitments are explored overleaf.
- **National Governments:** At 2021's UN Conference of Parties (COP) meeting in Glasgow, governments made pledges to strengthen their action, and better align with the reductions targeted in the Paris Agreement.
- **Campaign Groups:** The [Wiltshire Climate Alliance](#) is an umbrella group looking to accelerate climate action in the county. Climate strikes have also occurred in Wiltshire in recent years, with some driven by climate groups such as Extinction Rebellion.
- **Businesses:** 1,000 companies globally are setting [Science Based Targets](#). Wiltshire Council's Business Plan 2022-2032 includes a "Sustainable Environment" as a priority area.

Dangerous Impacts

Under a range of scenarios described in the CCC's [2021 Risk Assessment](#), it is expected that average winter precipitation will increase, both in terms of the intensity of the rainfall, and in terms of the number of wet days. Summers are expected to get drier, but the intensity of summer precipitation (when it does occur) will increase. More properties will face the risk of flooding, and areas already at risk will face more frequent flooding. Current flood defences will be subject to additional pressure which imposes risk for further flooding events. Climate change is expected to increase the risk of flooding across all sources in the future.

Local Action

The above impacts further underscore the urgency with which action needs to be taken. In the [2018 Emissions Gap Report](#), the UN identified local action as a key driver for change: "...non-state and subnational action plays an important role in delivering national pledges. Emission reduction potential from non-state and subnational action could ultimately be significant, allowing countries to raise ambition."

On the next page, we further explore Wiltshire's climate commitment, contextualised within the national context.



1. BACKGROUND & CONTEXT

CONTEXT AND COMMITMENTS

Contextualising this report

In February 2019, Wiltshire County Council acknowledged the climate emergency, and in July 2019 it pledged to make the council a carbon neutral organisation by 2030, focusing on emissions in its direct control (Scope 1 & 2). The council's direct emissions make up approximately 0.5% of all emissions in Wiltshire. This commitment is made in acknowledgement of the council's unique role in the community, where it can exert its influence and leadership to influence activities outside its direct control (Scope 3). A further pledge has been made to understand and reduce these emissions.

The 2022-2027 [Climate Strategy](#) sets out a framework for reducing emissions across Wiltshire over the next 5 years, including the council's own emissions. A roadmap is now needed to inform the council as to **what needs to happen next** in order to achieve carbon neutrality by 2030. The priority is to model the technological interventions required. Since 2013, the council has followed a Carbon Management Plan, reducing its emissions by 80%. These activities and the council's low carbon "project pipeline" inform the roadmap, along with a series of "stretch" interventions based on other feasible opportunities for action, including carbon offsets. Indicative costs are provided throughout, to help inform the case for action. This study will form part of the evidence base for a new Carbon Neutral Council Plan. The council's Scope 3 emissions are discussed in Chapter 2b alongside recommendations on how these should be measured and monitored moving forward.

A Carbon Neutral Wiltshire

The council also requires a pathway to carbon neutrality for Wiltshire County. This is delivered in Anthesis' report "Wiltshire Carbon Emissions Baseline and Reduction Pathways".

National, Regional and Local Commitments

Commitments have been made and targets have been set at all levels of government in response to the growing momentum around climate action:



The Paris Agreement set the international target to limit global temperature rise to well below 2°C with the aim of 1.5°C above pre-industrial levels. The IPCC's follow up report stated that this requires a global reduction in GHG emissions of 45% by 2030. Governments strengthened their commitments at the COP meeting in Glasgow in 2021.

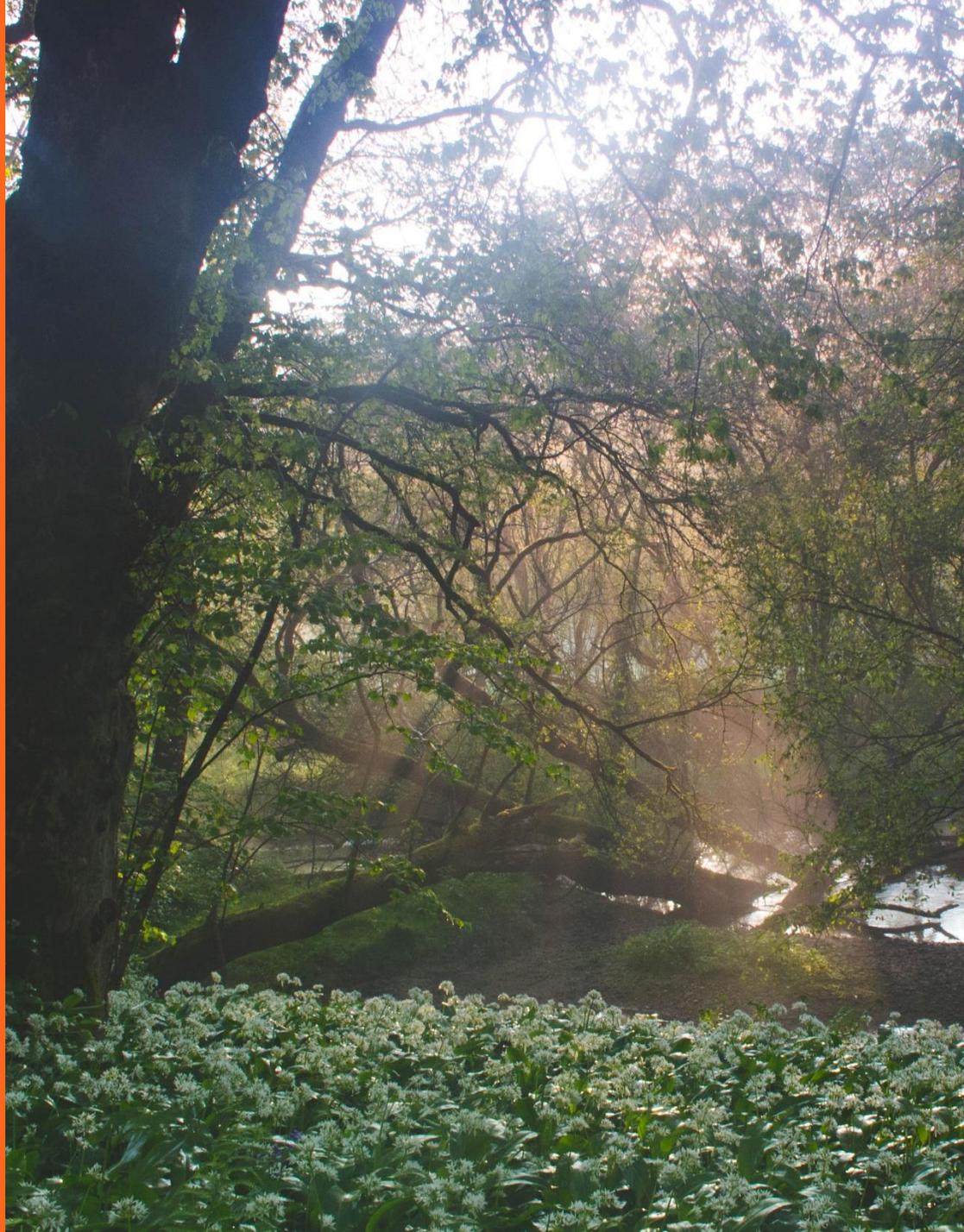


The Climate Change Act 2008 introduced a legally binding target for the UK to reduce GHG emissions by 80% by 2050. In June 2019, the target was updated to reach net zero by 2050. This was further enhanced in June 2021 when the government committed to reducing emissions by 78% by 2035 compared to 1990 levels.



The 2013 Carbon Management Plan outlined initial steps to address the council's emissions. Wiltshire Council has now committed to becoming a carbon neutral organisation by 2030. The council has also committed to seek to make the county of Wiltshire carbon neutral by 2030.

02a Scope 1, 2 Emissions Analysis



2A. SCOPE 1, 2 EMISSIONS ANALYSIS SUMMARY

Figures at a glance

- Emissions are split roughly equally between Scope 1 and Scope 2 - total Scope 1 emissions are 4,506tCO₂e; location-based Scope 2 emissions are 4,862tCO₂e.
- The majority (>67%) of Wiltshire Council’s emissions come from energy use in its buildings. Just under 25% of emissions are associated with streetlighting. A smaller proportion (9%) coming from Wiltshire’s vehicle fleet.
- Since April 2020, Wiltshire Council has purchased its electricity under a green tariff agreement. This means that its electricity is considered to be sourced from renewable sources and therefore Wiltshire’s market-based Scope 2 emissions are zero.
- The council’s footprint will likely increase in FY21/22 due to the depressed level of activity across council sites and within its fleet at the height of the COVID-19 pandemic in FY20/21.

Category	Emissions total	
	tCO ₂ e	%
Scope 1	4,506	48%
Gas	3,567	38%
Other fuels	85	<1%
Fugitive emissions	35	<1%
Fleet	819	9%
Scope 2 (Location Based)	4,862	52%
Building use (electricity)	2,616	28%
Streetlighting	2,246	24%
Scope 2 (Market Based)	0	-
Grand total (Location-based)	9,368	
Grand total (Market-based)	4,506	

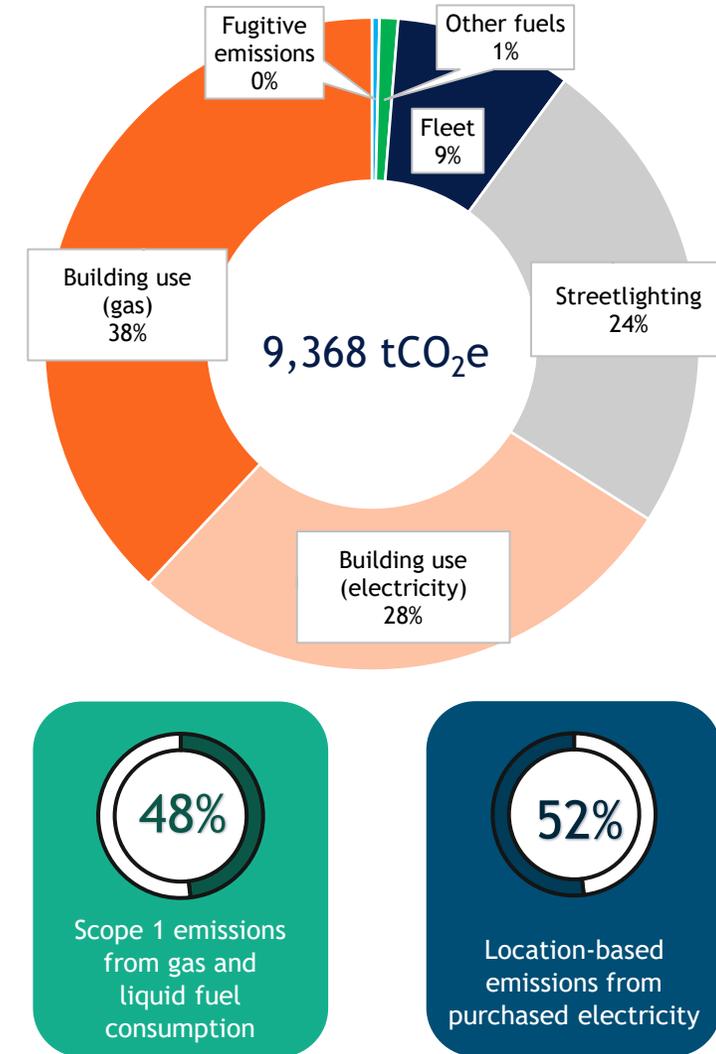


Figure 2.1: Wiltshire Council’s Scope 1 and 2 footprint, 2020/21

2A. SCOPE 1, 2 EMISSIONS ANALYSIS DEFINITIONS

The Greenhouse Gas (GHG) Protocol provides internationally recognised standards and guidance for companies, cities and other types of organisations. Following this standardised approach increases accuracy and consistency between reporting.

The GHG Protocol provides the definitions of GHG Scope which underpin this reporting - these are shown in the table opposite. Emissions are grouped according to their source into either Scope 1, Scope 2, or Scope 3 categories. This separates emissions in a way that enables organisations to shape policies and targets based on their organisational structures.

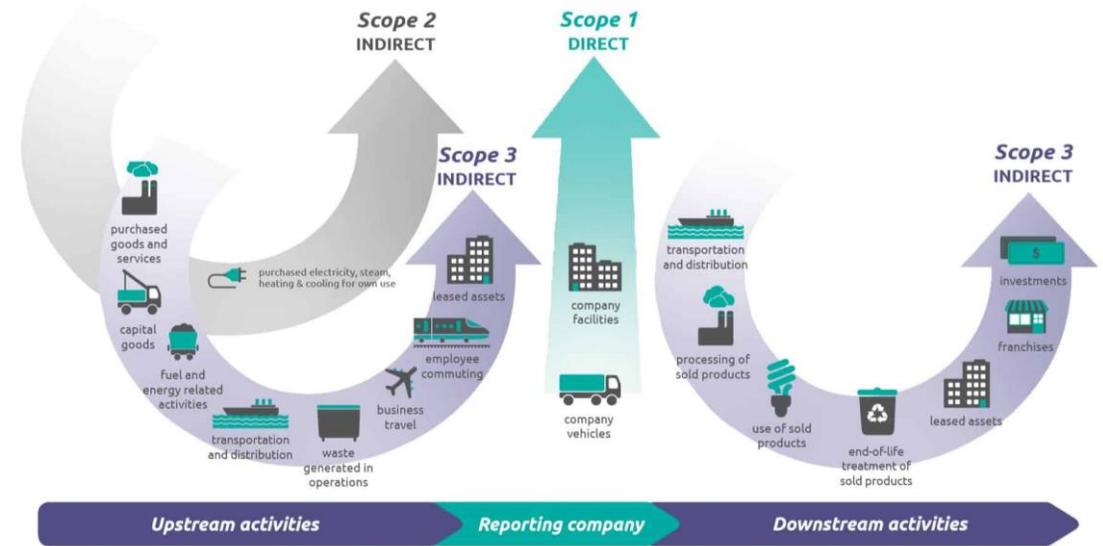
Organisations may also further sub-divide emissions within scopes to assist targeting their emissions reduction activities.

Reporting Scope 2 emissions

The [Greenhouse Gas Protocol Corporate Standard](#) recommends that emissions are reported using both a *location-based* and *market-based* assessment:

- *Market-based* emissions account for any low carbon energy products such as green electricity tariffs or power purchase agreements.
- *Location-based* emissions calculates emissions according to the UK's national grid factor based on a typical energy mix.

It is important that the council continues to measure its electricity consumption and report on both values each year.



GHG Protocol Definitions	
Scope 1	Direct GHG emissions occur from sources that are owned or controlled by the organisation, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.
Scope 2	Accounts for GHG emissions from the generation of purchased electricity consumed by the organisation. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.
Scope 3	All other indirect emissions. Scope 3 emissions are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation. Some examples of Scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

Figure 2.2: Diagram showing different emissions scopes and the activities covered by each, taken from the GHG Protocol, alongside a table of Scope definitions.

2A. SCOPE 1, 2 EMISSIONS ANALYSIS

ACCOUNTING BOUNDARIES

Carbon footprints should be calculated according to a well-defined organisational boundary. An organisational boundary is established by deciding which operations, subsidiaries and partners are defined as “under control” of the council according to certain criteria.

Setting a boundary

There are two approaches for defining the council’s organisational boundary. The suitability of each approach is usually dependant on legal and organisational structures as well as the council’s relationship with other parties. The approaches can be defined as follows:

- **Equity** - the council accounts for GHG emissions from operations according to its share of equity in those operations. An equity boundary reflects economic interest.
- **Control** - the council accounts for all the GHG emissions from operations over which it has control. “Control” can be defined as either operational or financial. The differences between the two control approaches are explored in Table 2.1 opposite.
 - *Operational control* - activities under full authority of the council. This is the defined boundary used by the council to define its carbon footprint.
 - *Financial control* - an activity is under financial control if the council has the ability to direct the financial and operating policies of said activity, with a view to gaining economic benefits or if it retains the majority risks and rewards of ownership.

It is entirely feasible that influence over certain activities changes from year to year and their emissions are reclassified as Scope 1 from Scope 3 (and vice versa) when the council reports its updated emissions.

Leasing relationship	Description	Financial control	Operational control	Example asset
Council are the lessor	Council still own asset and recognise on their balance sheet, but a third party operates it	✓	Explore degree of influence	Refuse collection vehicles (RCVs)
Council are the lessor	Asset no longer recognised as fixed asset on the council’s balance sheet, even though ownership is retained	✗	✗	Schools, social housing, county farms
Council are the Lessee	Council do not own the asset or recognise on their balance sheet, but do operate it	✗	Explore degree of influence	Leased vehicles
Council are the Lessee	Asset is recognised as fixed asset on the balance sheet (less common) and de-recognised from the lessor’s, even though still a lease	✓	✓	N/A

Table 2.1: Different control approaches for council assets. A ✓ implies the emissions from that asset would be considered within Scope 1 & 2. A ✗ implies emissions would be considered Scope 3.

Exploring influence to define “control”

Some activities require more detailed investigation to determine whether they constitute Scope 1 or Scope 3. Listed below are some common “stress tests” used to help reach a decision:

- How does the council physically “use” the asset? *E.g. does the council define how many collections RCVs carry out each month? Does its waste provider set collection routes?*
- If the asset requires maintenance or replacement, is the council responsible? *E.g. will the council pay out of its own budgets for RCV replacement?*
- Who retains the risk associated with the asset? *E.g. are RCVs operated on a finance lease or an operating lease?*
- Does the value of the lease exceed the value of the asset?

If the council is implicated in the responses to these questions, there is a strong case to include the activity within Scope 1 as opposed to Scope 3.

2A. SCOPE 1, 2 EMISSIONS ANALYSIS

ACCOUNTING BOUNDARIES

What has been assessed in this study?

Scope 1 & 2

The operational boundaries used for this included all data included in the council's Local Government Association (LGA) footprint.

This covers 180 metered sites and the council's owned vehicle fleet, excluding refuse collection vehicles (RCVs).¹

Scope 3

An indicative assessment of Scope 3 emissions, not assessed to the standard of the GHG Protocol has used the operational boundary of:

- Employee commuting & business travel
- Leased assets for which there was available data (schools)
- Waste generated in operations
- Fuel and energy related activities
- Purchased goods and services (including the council's major service contracts, some of which may be insourced in future)

1 - the *Exploring influence* box on page 13 discusses various "tests" the council can apply to a particular activity to determine whether or not emissions are classified under Scope 1 or 3 - these are particularly relevant to RCV emissions. There is a strong argument to include RCV emissions (estimated on the scale of 1,500-1,700tCO₂e) under Scope 1 from a standpoint of maximising overall carbon emissions as well as demonstrating the council's leadership and accountability. There are also considerations that encourage their inclusion under Scope 3; currently the council's waste contractor sets collection routes. In this report, to allow consistency with the LGA reporting, RCV emissions have not been included under Scope 1. Reclassifying RCV emissions may be a consideration for the council in future reporting years.

Carbon Neutral vs Net Zero

There are two main terms used to characterise an organisation's low carbon status: *carbon neutral* and *Net Zero*.

The internationally recognised standard [PAS 2060](#) defines carbon neutrality as: "*...a condition in which during a specified period there has been no net increase in the global emission of greenhouse gases to the atmosphere as a result of the greenhouse gas emissions associated with the subject during the same period.*"

Net Zero is a similar concept however differs on the following points:

- Carbon neutral can relate only to Scope 1 & 2, whereas Net Zero covers all emissions scopes.
- Residual emissions can be neutralised by certified carbon removal or avoidance offsets for carbon neutrality, whereas Net Zero requires projects that specifically remove carbon from the atmosphere.
- Net Zero targets must align to a 1.5°C science-based target, whereas no specific pathway is required for a carbon neutral target.

Achieving a carbon neutral Wiltshire Council first means establishing an operational boundary and reporting against it, which the council has done for a number of years. Emission reduction projects should be designed and implemented to minimise Scope 1 & 2 emissions as far as possible (see Chapter 3). Any residual emissions must then be offset (see Chapter 4).

02b Scope 3 Emissions Benchmarking



2B. SCOPE 3 EMISSIONS BENCHMARKING HIGH-LEVEL ASSESSMENT

This chapter reports some of the council’s Scope 3 emissions, which have been benchmarked using high level methodologies and readily available data. This analysis does not represent a full baselining exercise for every Scope 3 emissions category, but indicates emissions hotspots within council operations outside of its direct fuel consumption.

It should also be made clear that Scope 3 emissions are not included as part of the council’s 2030 commitment to carbon neutrality as an organisation and Scope 3 emissions sources have not been included as part of the pathways analysis in later chapters.

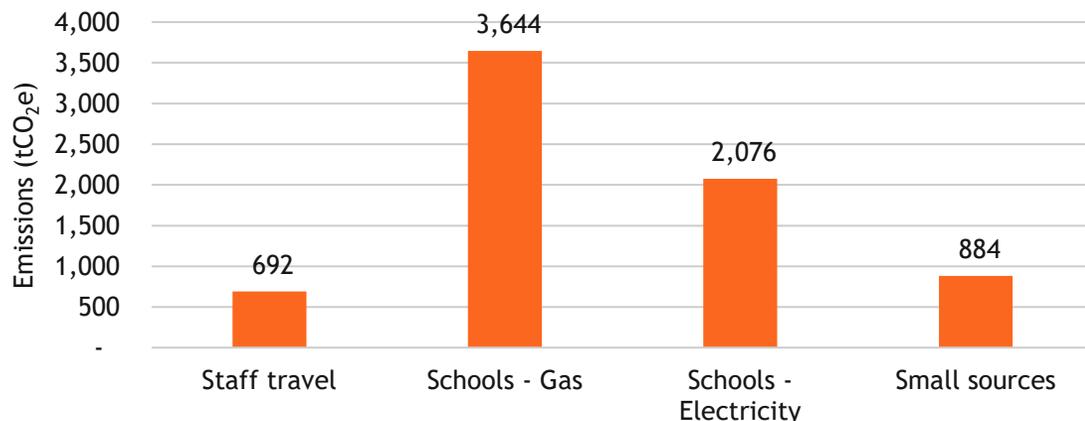


Figure 2.3: Scope 3 emissions benchmarked as part of this analysis. Procurement emissions are shown on the next page.

Scope 3 emissions breakdown by source

Under the Greenhouse Gas Protocol, there are fifteen categories of Scope 3 emissions to assess for corporate organisations, though not all of these are relevant to council operations.

The following categories have been assessed as part of this benchmarking exercise:

- **Schools:** Schools fall outside of the organisational control boundary defined by the council, but do count towards Scope 3 totals as a downstream leased asset. These emissions relate to gas and electricity consumption in schools.
- **Staff travel:** Staff commutes and business travel emissions are recorded under Scope 3 categories and have been shown as a single bar on this graph.
- **Small sources:** Waste generated by the council through its operations creates Scope 3 emissions when they are collected and treated, and very small levels of emissions are created through transmission and distribution of energy along national grid infrastructure as well as “well-to-tank” emissions from gas supply.

The total from schools and staff travel is 6,412tCO₂e, a total roughly comparable to the council’s Scope 1 & 2 total in terms of magnitude.

- **Procurement:** Council expenditure data has been assessed for FY20/21 and forms the most significant contribution to the council’s Scope 3 footprint. These are shown in more detail overleaf.

Procurement emissions estimates - method overview

The methodology used to estimate emissions from procurement is a high-level assessment, based on the broad application of industry sector emissions factors. Expenditure is categorised according to its industry sector before being converted into emissions using flat factors i.e., there was no allowance made for suppliers being above or below average performance in terms of their emissions. This means that the actual footprint from procurement emissions is likely to differ from the estimate given. A more accurate and detailed method (described in more detail on p.19) is recommended for future estimates, as well as for tracking these emissions over time.

2B. SCOPE 3 EMISSIONS BENCHMARKING COUNCIL EXPENDITURE

The most significant contributor to the council’s Scope 3 emissions is procurement spend. Here we explore in more detail the emissions created through council expenditure on goods and services, which have been estimated in excess of 269,000tCO₂e.¹ These emissions are the result of fossil fuel consumption stimulated by council expenditure e.g., heating in contractor buildings, transporting and manufacturing products bought by the council.

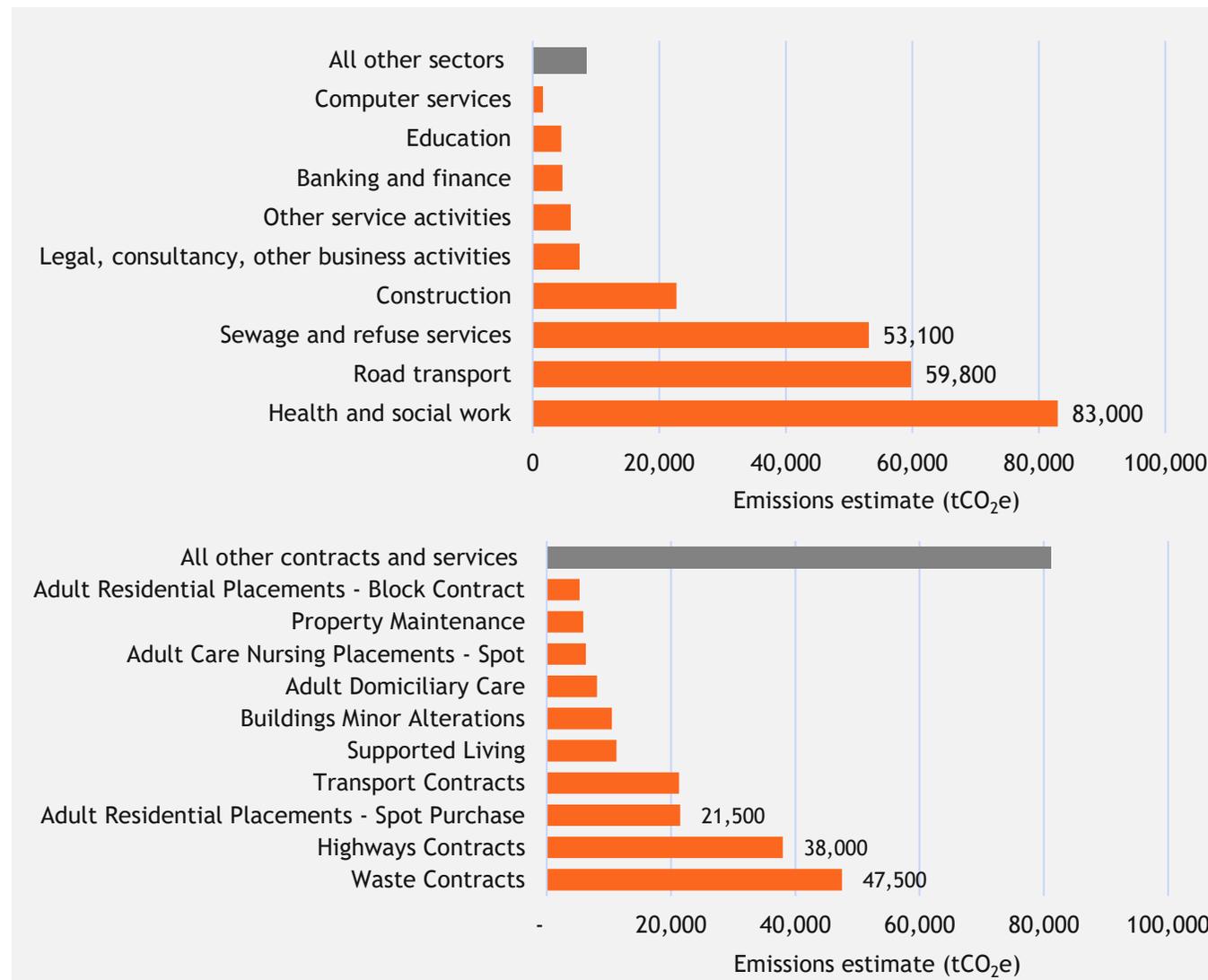
Findings

The graphs opposite provide a breakdown of council expenditure as it relates to emissions (full data shown in Appendix 1). The analysis indicates:

- **Emissions by industry category (Figure 2.4):** The most significant contributors to emissions based on industry sector are health (32%), transport (23%) and waste services (20%). Smaller contributions come from the construction (9%), professional services (7%) sectors.
- **Emissions by contract (Figure 2.5):** In terms of individual contracts and services, the council’s waste and highways procurement are the most significant emissions hotspots. Together these constitute 45% of total emissions (25% and 20% respectively). Other significant contributions to emissions come from adult residential placements and other transport contracts (both 11%). The top ten contracts together constitute 70% of estimated emissions, but only around 50% of expenditure.

Figure 2.4 (top): Procurement emissions estimates by industry category.

Figure 2.5 (bottom): Procurement emissions estimates by contract.



¹ - This includes emissions estimated from a grid-average electricity contracts - it is acknowledged that this represents an overestimate given the council’s green tariff arrangement.

2B. SCOPE 3 EMISSIONS BENCHMARKING COMPARISON WITH SCOPE 1 & 2 EMISSIONS

Using this analysis

These results are best used as a tool to indicate emissions hotspots in the council's supply chain and contracts.

The method applies nationally-derived emissions factors for expenditure in given industry sectors and is not sensitive to the specific nuances of suppliers' products and processes. This limitation means that the totals quoted for certain industry sectors are likely to vary from the real-world performance of the council's suppliers. We encourage the council uses this benchmarking exercise to identify emissions "hotspots" as the basis for further investigation with different suppliers and contracts.

In some cases the variation between estimated emissions and those verified by the council's supplier may be significant e.g., expenditure on electricity, which falls under a green tariff in reality, but under the method used here emissions are apportioned according to an average grid factor.¹

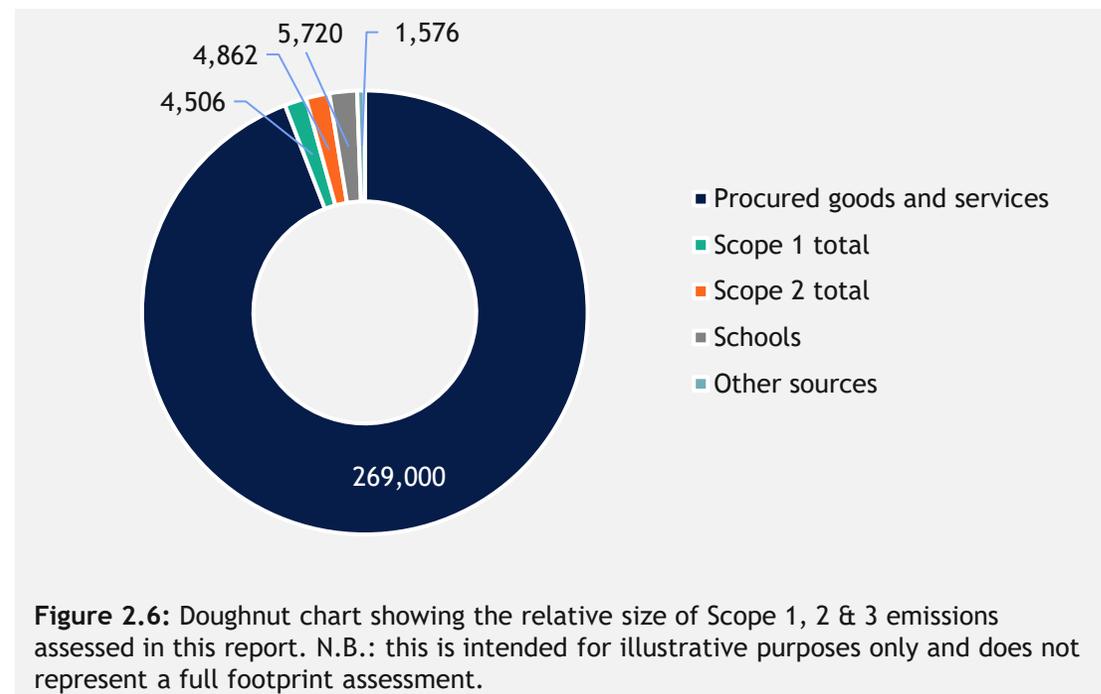
More details and recommendations on next steps for the council to engage with its supply chain and improve the estimates given here can be found on page 21.

1 - as a result, electricity emissions have been omitted from Figures 2.4 & 2.5. The estimates have been included in the emissions totals and can be found in Appendix 1.

Comparing Scope 1 & 2 footprints with Scope 3

Figure 2.6 below shows the relative sizes of the council's Scope 1 & 2 footprint relative to the Scope 3 emissions categories estimated in this report.

It should be noted that the analysis carried out in this report does not represent a full Scope 3 footprinting exercise, but does give an indication of their relative sizes.



02c Data review - recommendations



2C. DATA REVIEW - RECOMMENDATIONS

SCOPE 1 & 2 RECOMMENDATIONS

In this section we provide recommendations for improving the quality of future footprinting data. This ensures emissions reductions are properly monitored and facilitates comparison and progress benchmarking with other years.

Data recommendations - Scope 1 & 2 emissions

In Section 2a we present our review of the council's Scope 1 and 2 emissions. This is based on calculations undertaken by the council to report using the Local Government Association (LGA) [GHG Accounting Tool](#). To ensure completeness in the LGA tool reporting, we carried out a high-level analysis of the council's key emissions sources based on an additional data collection exercise.

In future emissions reporting exercises, we recommend the council:

- **Reassess activities within the operational boundary each year** - having a full and clear understanding of the council's operations is an important prerequisite for accurately reporting its emissions. Changes to contractual arrangements may warrant the amendment of some activities into Scope 1 emissions categories. There may also be justification to include some activities currently under Scope 3 as Scope 1 in the future, on the basis of demonstrating council leadership and maximising emissions reductions (e.g. RCV emissions - see pages 13 & 14).
- **Apply an operational boundary consistently** - include all emissions sources, including acknowledgement of small sources such as communal lighting in staircases and communal areas of shared premises at residential sites.
- **Report Scope 2 emissions using both location-based and market-based approaches** - As outlined by the GHG Protocol, it is standard practice to include location-based emissions from Scope 2 sources. A market-based approach serves to highlight the value of a green tariff in minimising the council's footprint and encourages transparency around the council's data gathering and procurement practices.
- **Apply a single management system to track vehicle mileage** - At present, the council uses two vehicle management systems (Tranman and Triscan). Applying a single management system would improve the ease and accuracy of mileage reporting of the council's vehicle fleet.

Updating your emissions profile

The council should take these recommendations forward as part of continued annual updates to its [emissions profile](#). Updating your organisational emissions profile annually will be important in the near-term in order to:

- **Track progress of your decarbonisation initiatives** - Naturally, it is important for the council to be able to demonstrate the impact of any decarbonisation initiatives. Continued annual updates to your emissions profile will allow you to ensure that such initiatives are delivering impact, and that the savings delivered are in line with those anticipated through the pathways modelling.
- **Account for the emissions impact of COVID-19** - One impact of COVID-19 lockdowns is that activities in 2020-22 are unlikely to be representative of those under pre-pandemic conditions. Looking ahead, COVID-19 restrictions are likely to ease and the council will return to activities more typical of pre-pandemic operations. In future years, the council may wish to undertake a review of the differences in its emissions profile between the years during and after the pandemic. Identifying any impacts of the pandemic will help to ensure differences in the emissions profiles can be understood in their proper context and may also have a bearing on future updates to the pathways planning.

2C. DATA REVIEW - RECOMMENDATIONS

SCOPE 3 RECOMMENDATIONS

Data recommendations - Scope 3 emissions

In section 2b we present our high-level review of the council’s Scope 3 emissions. This is in line with the council’s commitment in the Climate Strategy to “[work] to understand and reduce Scope 3 emissions”.

SBTi guidance on Net Zero mandates inclusion of Scope 3 emissions, so this is particularly relevant in relation to the council’s Stretch goal, for which a comprehensive review of the council’s Scope 3 emissions will be required. Based on our review, key considerations for the council are:

- **Report against all Scope 3 operations:** It is very important to define the extent of the council’s influence over assets not within its direct control that may be under ownership, such as schools and farms. This will help the council to understand the impact of any decisions on asset transfers on the target trajectory, and to prioritising any carbon mitigation activities focussed on these parts of the portfolio, such as which sites to retrofit. See our notes on *Exploring influence* for more details.

Scope 3 emissions have been estimated to be significantly larger than Scope 1 & 2, demonstrating the opportunity for the council to have a much greater impact on wider emissions reduction beyond its own direct footprint.

- **Improve data visibility for procurement analysis:** This is critical for proper benchmarking of the council’s Scope 3 emissions and going beyond the current level of (low) detail available. The council should seek to move to an activity-based emissions methodology for these emissions. We recommend engaging with larger council suppliers to gain a more complete assessment of emissions coming from their activities. Some organisations may already be reporting their emissions in line with established methodologies, which will aid consistency of the analysis.

This will also allow the council to integrate carbon considerations into future decisions on insourcing contracts, since these carry implications for the council’s Scope 1 & 2 footprint (and ultimately its carbon neutral target). The table below shows some suggested activity data to research, which would allow the council to more accurately report and track its procurement emissions.

This engagement could also include consideration of whether council suppliers have any sustainability strategies, plans and policies in place to help the council more accurately report their impact. Understanding this may also help better inform any future engagement and or partnerships designed to help support in reducing their emissions, and could serve the council well if carbon insetting initiatives are required to reach carbon neutrality.

Emissions group within procured goods & services	Current data	Activity data
The leasing of private sector buildings	Spend data	EPC rating per accommodation location; length of time occupied; actual utility consumption per occupancy
Waste services	Spend data	Emissions per waste stream by volume
Healthcare, SEND, care services including residential and home-based care	Spend data	Suppliers’ S1&2 emissions data per year per contract

Table 2.2: Table showing suggested activity data the council could use to improve the accuracy of its footprint from procured goods and services.

03

Emissions Reduction Pathways



3. EMISSIONS REDUCTION PATHWAYS INTRODUCTION

Wiltshire Council's journey so far

In line with the council's Climate Strategy, Figure 3.1 sets out future pathways in the context of historic emissions since 2014/15. This shows the significant progress Wiltshire Council has made up to 2020/21, reducing emissions by 81% from a 2014/15 baseline.

Emissions reductions have been due to a range of measures, most notably the switch to a green electricity tariff, which has provided zero carbon electricity for corporate estate and streetlights since 2019/20. Other measures include estate rationalisation and ongoing investment in energy efficiency projects.

The council's £5.2m Corporate Carbon Reduction Programme is focused on a range of measures, including decarbonising heat in buildings, installing solar PV and heat pumps. Energy consumption from streetlights has been reduced by part-night lighting, dimming and a £12m investment in LEDs.

The onward pathways towards carbon neutrality are shown as dotted orange lines. Tackling the remaining emissions will be challenging. The shaded area indicates a range of pathways to carbon neutral, based on differing levels of ambitious activity across the council's estate and fleet operations. The future pathways are explained in detail in the rest of this chapter.

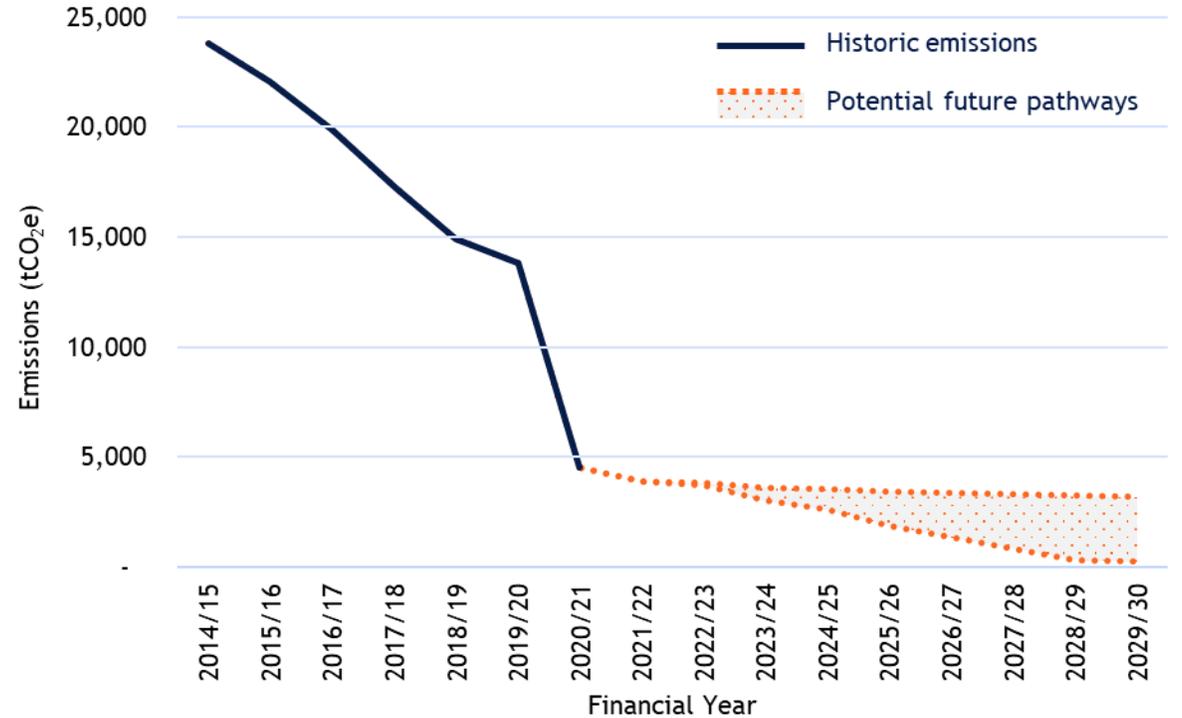


Figure 3.1: Historic emissions and reduction pathways for council Scope 1 and 2 emissions (using the market based method) over time. Pathways are explained in more detail from page 24 onwards.

3. EMISSIONS REDUCTION PATHWAYS INTRODUCTION

Reaching Wiltshire Council’s ambitious target of becoming a carbon neutral council by 2030 will require the delivery of a range of different projects and initiatives across its operations. This chapter describes potential future pathways for the council’s emissions based on the most recently recorded activities and potential new projects.

Pathways summary

The pathways analysis is focused on Wiltshire Council’s Scope 1 & 2 emissions, in line with the council’s target of carbon neutrality by 2030. We have considered the built environment and transport emissions within the council’s 2020/21 baseline and made estimates for future emissions in each financial year to 2030 based on differing levels of project intervention (business-as-usual (BAU), Pipeline & Stretch). A summary of the total Scope 1 & 2 emissions pathways can be seen in Figure 3.2 opposite. More detailed notes on the pathways methodology can be found in Appendix 2.

Science based budgets

Pathways have also been compared with the annual year-on-year reduction set out by the Tyndall Centre’s research into a science-based target for the Wiltshire area. The Tyndall Centre findings describe what is necessary for Wiltshire to “play its part” in meeting Paris Agreement goals. It is focused on limiting the *cumulative* amount of emissions below a defined threshold based on historic emissions within the region. It should be noted that this pathway is not based in tangible actions and interventions, but defines an upper ceiling for emissions based on a “carbon budget” approach.

To encourage the council to play its part in meeting the area-wide carbon budget, we have included an indicative pathway demonstrating the annual reduction rate for the council’s own emissions. This is shown by the dashed line in Figure 3.2.

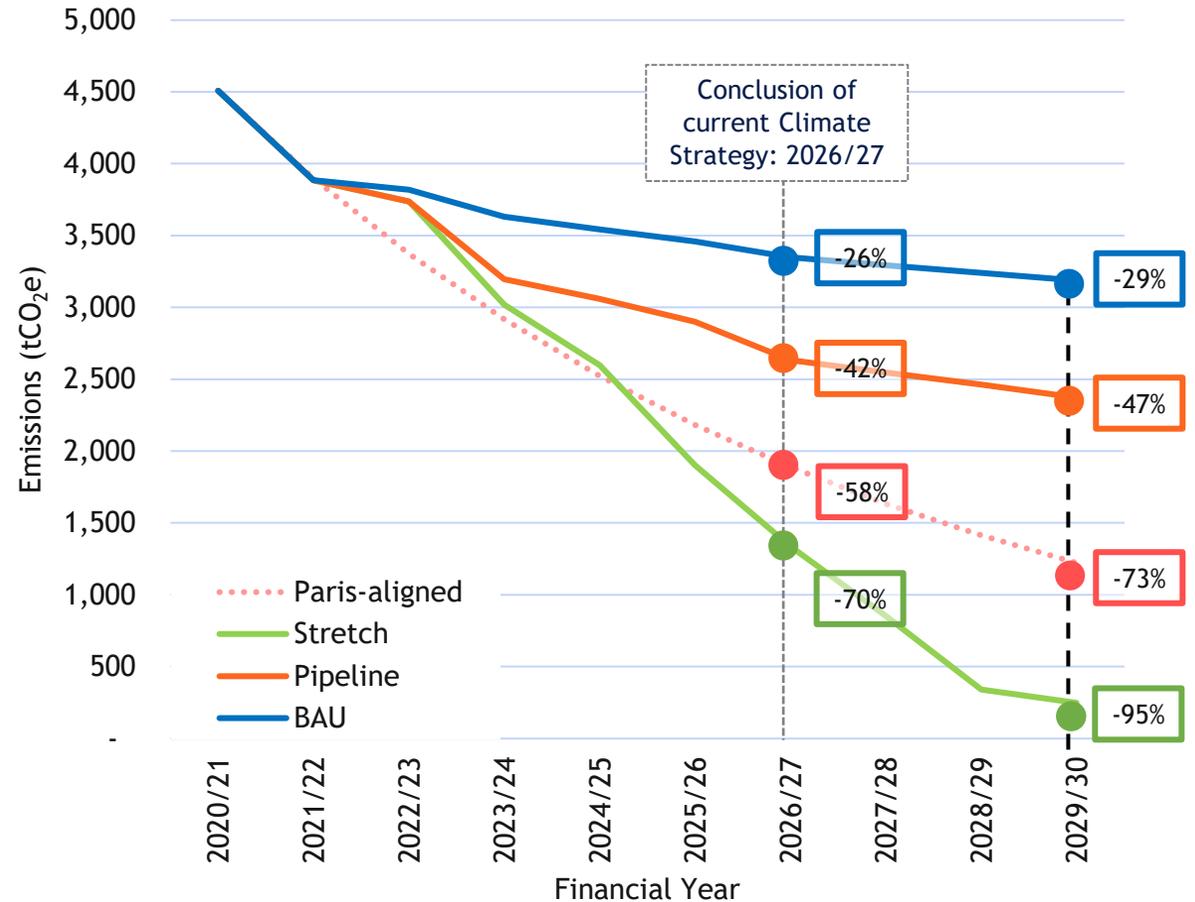


Figure 3.2: Emission reduction pathways for council Scope 1 and 2 emissions (using the market-based method) over time given BAU activity, the completion of projects in the council’s pipeline and further reduction activities shown in the stretch pathway.

3. EMISSIONS REDUCTION PATHWAYS INTRODUCTION

How have these pathways been designed?

Projects in the council’s pipeline were discussed with council officers through a workshop session and a data request form. We have also heavily referenced council documents, including the Corporate Carbon Reduction Programme (built environment) and Draft Fleet Strategy & and Action Plan (transport).

For each project, an estimate has been made of its impact on the council’s emissions. For buildings pathways, these estimates follow research carried out in the Buildings Energy Efficiency Survey (BEES), which serve as the technical basis in the Committee on Climate Change Sixth Carbon Budget reports. For transport pathways, varying degrees of electrification in replacement of council vehicles have been assessed. An illustrative diagram showing this process is shown opposite.

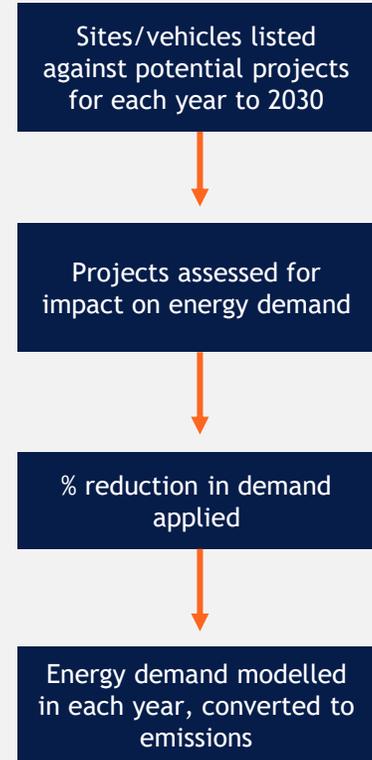
All estimates assume that the council continues its current commitment to a renewable electricity tariff, which is currently scheduled to be renewed in 2027. Emissions from electricity are effectively treated as zero under the market-based approach employed in this analysis. The recommendations around energy demand reduction extend to electricity consumption despite this, however, and the council is encouraged to reduce demand where possible e.g., through its IT operations.

An alternative version of our pathways, following a *location-based* approach for Scope 2 electricity emissions, can be found in Appendix 3. The rest of this chapter explores in more detail the pathways and measures for the built environment and transport.

Impact of COVID-19

It should be noted that due to the COVID-19 pandemic, activity data for transport and across some buildings was atypical compared to non-pandemic years. As the council publishes its baseline in FY2021/22 it will likely see a rebound in emissions as a result of lockdown measures being lifted and more typical operations being restarted.

Pathways methodology



Example: Corsham Campus

- Listed to have BMS survey/upgrade in pipeline, start date to be confirmed
- Starting point for emissions: raw energy consumption data from 2020/21 baseline year

- Building and project “type” cross referenced with BEES survey
- Corsham Campus BMS upgrade falls under a “building instrumentation & control” project at a “community, arts & leisure” site

- Demand reduction applied to baseline consumption data following estimated completion of BMS upgrade
- Extent of demand reduction is defined in BEES, according to the project and building type

- Consumption data (in kWh) converted into tCO₂e for each year up to 2030 according to all modelled projects at all sites

This general approach was taken for all emissions sources in the built environment and transport sectors. N.B.: Mileage data was used instead of energy consumption data in the transport sector.



3. EMISSIONS REDUCTION PATHWAYS

BUILT ENVIRONMENT – PATHWAYS SUMMARY

Figure 3.3 opposite shows the three emissions scenarios for council-owned buildings using a market based approach. The Stretch pathway (shown in green) achieves a 94% reduction in emissions against the 2020/21 baseline, whilst the business-as-usual (BAU) and pipeline pathways are estimated to achieve reductions of around 30% and 41% respectively. Milestone reductions are shown at 2026/27 in line with the conclusion of the current Climate Strategy.

Key

- **Business-as-usual (BAU):** Assumes the council delivers only projects that are currently underway (as at the end of 2022) or have been completed since the 2020/21 baseline. There are also assumed to be very small reductions in demand considered up to 2030.
- **Pipeline:** Assumes the council delivers projects that are currently underway as well as those that are in planning, fundraising and application stages i.e., “pipeline” projects.
- **Stretch:** Assumes the council successfully delivers all pipeline projects as well as the longlist of potential projects identified in Phase 1 of the Corporate Carbon Reduction Programme. Also included within this pathway are additional behaviour change and heating technology retrofits in the latter half of the 2020s.
- ⋯ **Paris-aligned carbon budget:** Annual reduction rate for area-wide carbon budget, applied to council’s own emissions.

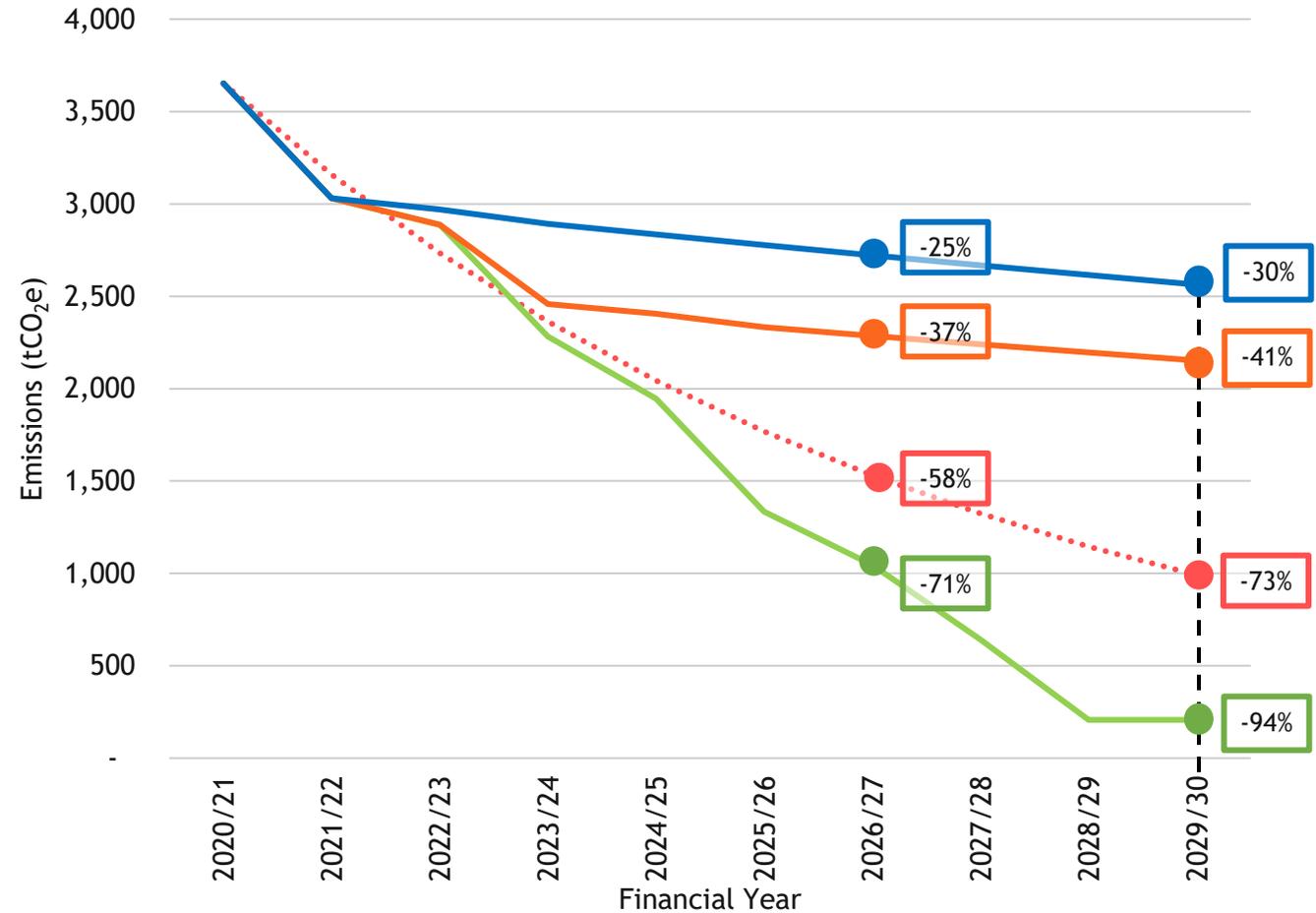


Figure 3.3: Emission reduction pathways for council Scope 1 and 2 emissions from the built environment (using the market-based method) over time given BAU activity, the completion of projects in the council’s pipeline and further reduction activities shown in the stretch pathway.



3. EMISSIONS REDUCTION PATHWAYS

BUILT ENVIRONMENT – SUMMARY OF MEASURES

The table below shows the measures relating to the Built Environment that have been considered for each pathway scenario. Visibility over the council’s confirmed pipeline extends only as far as 2023/24. It should be noted that all demand reduction projects in the Stretch pathway were originally identified on the longlist within the council’s Corporate Carbon Reduction Programme. The rest of the section on the built environment discusses each of these pathways in more detail. More details on the methodology behind the carbon reduction estimates can be found in Appendix 2.

Pathway	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
BAU	Baseline year	Already completed/ underway	Very small reductions in demand to reflect changes in system efficiencies and some behaviour change							
Pipeline		Already completed/ underway	Projects confirmed, but not yet underway	Planning applications submitted/ funding agreed	Very small reductions in demand to reflect changes in system efficiencies and some behaviour change					
Stretch		Already completed/ underway	Projects confirmed, but not yet underway	Planning applications submitted/ funding agreed Behaviour change programme	Elimination of all oil fuels Installation of efficient lighting, water saving measures, ventilation	Building management systems, fabric improvements c. 50% of eligible sites with PV installed are retrofit with biomass boilers	Installation of efficient lighting, water saving measures, ventilation c. 50% of eligible sites with PV installed are retrofit with biomass boilers	Building management systems, fabric improvements c. 50% of largest remaining sites are retrofit with low-carbon heating	c. 50% of largest remaining sites are retrofit with low-carbon heating	Residual emissions offset to achieve carbon neutrality

Table 3.1: Columns in the table indicate the types of project completed for each pathway (shown as a row).



3. EMISSIONS REDUCTION PATHWAYS BUILT ENVIRONMENT – PIPELINE

The council have already made significant progress towards decarbonising their own estate and have a strong pipeline of projects currently underway or in planning stages that can deliver significant progress towards the 2030 target.

Our analysis indicates that the current pipeline of projects can deliver a 41% reduction in carbon emissions by 2030 against the baseline year of 2020/21. Projects currently underway or close to completion at time of writing in Spring 2022 (i.e. the BAU pathway) offer a carbon reduction potential of around 30% in that timeframe.

What is in the council's pipeline?

The council's BAU and pipeline pathways were informed by conversation with council officers and by a review of projects currently being managed under the Corporate Carbon Reduction Programme. Only sites that were counted towards the Scope 1 & 2 emissions totals were considered for this analysis. The nature of the council's pipeline projects vary widely, but measures in this pathway can be grouped into the following categories:

- **Demand reduction projects:** Measures which reduce the demand for energy in a building. Some measures that are currently underway across council sites include LED replacements, building management system (BMS) upgrades, ventilation and building fabric improvements and new air handling units.
- **Heating system retrofit:** The removal of fossil-fuel based heating systems (i.e. gas or oil boilers) in favour of renewable heating (heat pumps or biomass). Examples currently in the pipeline include electric air-source heat pump replacements for oil-based systems at council-owned depots as well as biomass boiler installations.
- **On-site renewable installations:** Solar PV and solar thermal installations on council buildings. The council has invested heavily in solar PV technology across many sites within the council portfolio.

In total, over 70 pipeline projects have been assessed for their carbon reduction potential as part of the council's pipeline pathway. The majority of these relate to demand reduction and PV installation projects.

The council's green tariff and local PV installations

All three pathways assume that the council renews its green tariff when up for review in 2027. Renewal of the green tariff each year is strongly recommended - despite its additional cost over alternative tariffs - given the significance of its impact on reducing emissions (effectively cutting them in half).

The benefits of local PV installation (such as improved resilience to changing energy costs) do not neatly translate into emissions reductions that can be shown by this analysis, since we have adopted a market-based approach. This is not to suggest that PV installations should be deprioritised by the council; rather an acknowledgement of the limitations of the analytical approach in capturing the carbon benefit. It was identified through discussion with officers that a barrier to further development of electric heating system retrofits has been constraints on grid supply. On-site generation at council-owned buildings is therefore a valuable asset when considering hybrid low-carbon heating systems in future. Additionally, on-site generation provides significant energy security in the face of a volatile energy market and rising prices, as well as the basis for future energy storage technologies.

Whilst still important to pursue PV installations at as many sites as possible for energy security and demand management, the most significant individual projects for carbon reduction are typically heating systems retrofits. These represent a wholesale shift from on-site fossil fuel consumption to renewable sources and form the basis of the more ambitious Stretch pathway. Alternative means of reducing the council's footprint and how to treat residual emissions (i.e. offsetting and asset transfers) are explored in Chapter 5.



3. EMISSIONS REDUCTION PATHWAYS BUILT ENVIRONMENT – STRETCH

Despite the positive progress towards carbon reduction to the end of 2023/24 currently in the pipeline, the council will need to deliver more projects throughout this decade in order to achieve its carbon neutral target by 2030.

The stretch pathway describes a programme of projects that can reduce emissions from the council’s buildings by over 94% against the baseline year. This builds on the work underway in the council’s pipeline as well as demand reduction and heating system retrofit projects up until the end of the decade.

What does the Stretch pathway assume?

The Stretch pathway builds on the Pipeline pathway, with the following additional projects delivered after 2023/24:

- **Behaviour change:** Carbon and energy management initiatives across all council operations by the end of 2023/24 e.g., education and awareness training for council staff, heating ventilation and air conditioning maintenance, sub-metering.
- **Additional rounds of demand reduction projects:** A large number of demand reduction projects were initially longlisted by the council in the Corporate Carbon Reduction Programme but have yet to be developed into projects. These are assumed to be delivered in phases over a four-year period. These include some “low-hanging fruit” projects, such as LED replacement or air handling unit upgrades, as well as more extensive fabric improvements and BMS upgrades.
- **Heating systems retrofits:** A programme of gas boiler replacements is assumed to start in 2025/26. Due to grid constraints, these are initially assumed to be biomass boilers installed on sites where there is also PV installed. In later years, heat pumps are assumed to replace gas boilers at the largest sites.

Sites for future heating system retrofit projects have been prioritized according to their size i.e., largest first, as well as any sites with PV installed. This was done on the basis that large sites represent the greatest opportunity for carbon reduction and switching to alternative heating systems may be supported by on-site renewables access. All oil fuel consumption is also assumed to have been phased out by 2024/25, in line with national targets set out in the [Committee on Climate Change](#) report for the building sector.

Overall, the energy demand across council sites is projected to fall by around 19% as a result of efficiency measures and the adoption of more efficient heating systems. Within that transition, however, consumption of electricity is projected to increase 18%, from around 21 GWh in the baseline year to just under 25 GWh in 2029/30. This underscores the value in having on-site renewables to relieve pressure on the grid as well as offering savings on energy bills.

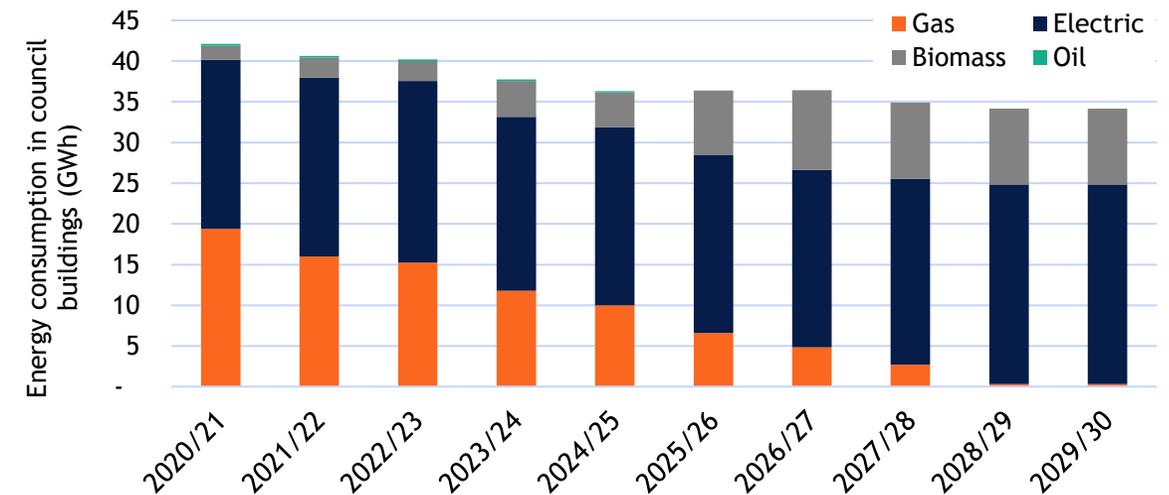


Figure 3.4: Breakdown of energy consumption in council buildings, by energy source, for the stretch pathway.

3. EMISSIONS REDUCTION PATHWAYS TRANSPORT – PATHWAYS SUMMARY



Figure 3.5 opposite shows the three emissions pathways as they relate to emissions from the council’s owned fleet. The Stretch pathway (shown in green) achieves a 99% reduction in against the 2020/21 baseline, whilst the BAU and Pipeline pathways are estimated to achieve reductions of 77% and 28% respectively. Milestone reductions are shown at 2026/27 in line with the conclusion of the current Climate Strategy.

- Key**
- **BAU (HGV offsets):** Assumes the council replaces all vehicles under 1.75t with EV, all Class III vans with hybrid equivalents, and makes no changes to its HGV fleet, instead opting to offset those emissions in 2030.
 - **Pipeline (HGV biofuels):** Assumes the council replaces all vehicles under 3.5t with EV equivalents, and transitions HGVs to low-carbon biofuels.
 - **Stretch (All electric):** Assumes all vehicles are replaced with EV equivalents.
 - ⋯ **Paris-aligned carbon budget:** Annual reduction rate for area-wide carbon budget, applied to council’s own emissions.

In all pathways it is assumed that the transition to electric vehicles (EV) follows the successful installation of EV charge point infrastructure at council sites and that the council’s renewable energy tariff is renewed in 2027.

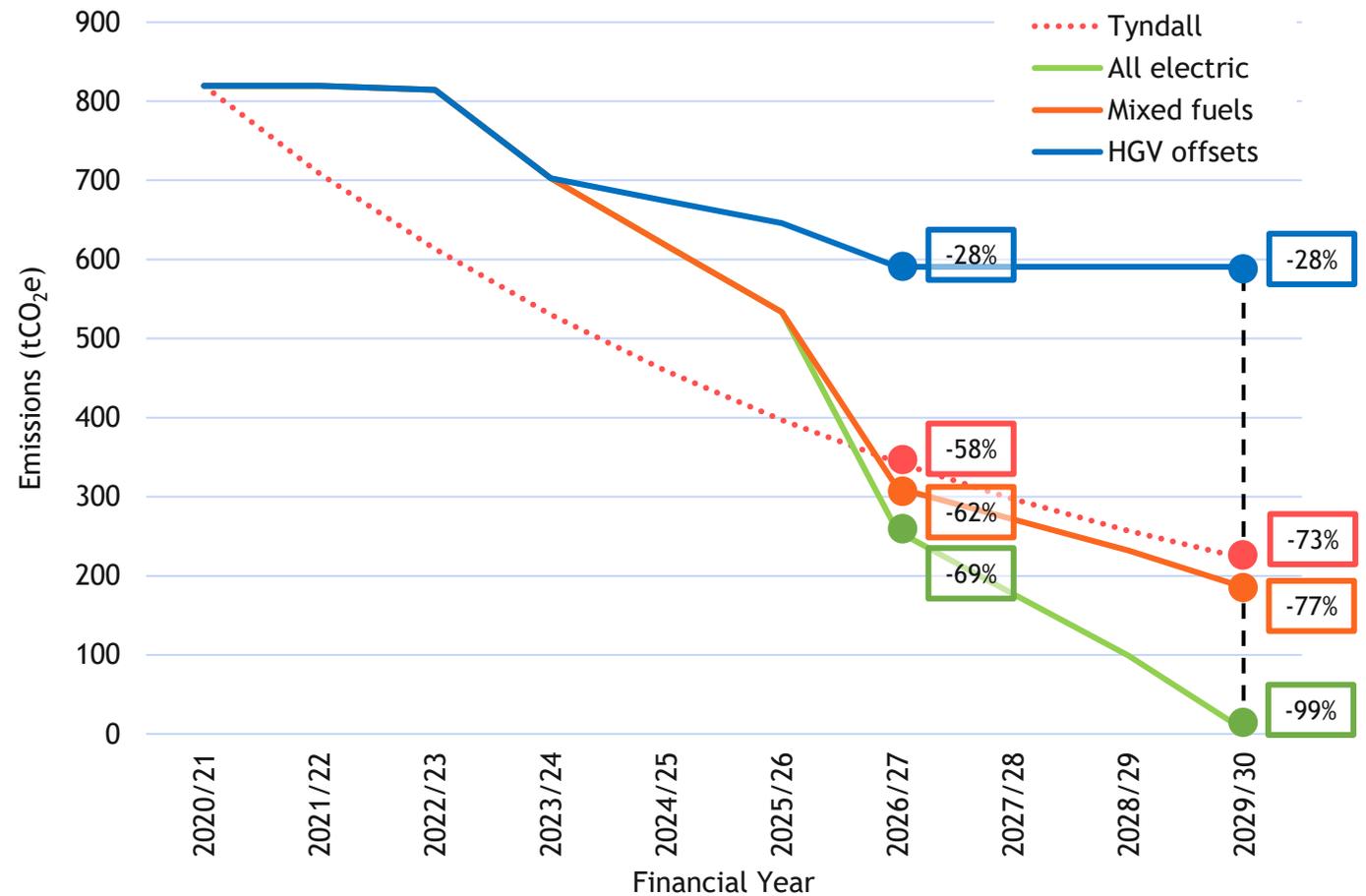


Figure 3.5: The emissions reduction pathways for the council's transport operations given BAU, pipeline and Stretch scenarios.

3. EMISSIONS REDUCTION PATHWAYS TRANSPORT – SUMMARY OF MEASURES



The table below shows the measures that have been considered for each pathway scenario. Visibility over the council’s confirmed pathway extends only as far as 2023/24, but it should be noted that all demand reduction projects in the Stretch pathway were originally identified on the longlist within the council’s Draft Fleet Strategy & Action Plan. The rest of this chapter discusses each of these pathways in more detail. More details on the methodology behind the carbon reduction estimates can be found in Appendix 2.

Pathway	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
BAU (HGV offsets)	Baseline year	EV charging infrastructure installed	Pool cars are replaced with EV	All small vehicles are replaced with EV	Class III diesel vans phased out and replaced by hybrid equivalents		HGVs not directly replaced, with remaining fleet emissions offset			
Pipeline (HGV biofuels)		EV charging infrastructure is installed	Pool cars are replaced with EV	All small vehicles are replaced with EV	Class III diesel vans phased out and replaced by EV equivalents, smaller EV vans or e-cargo bikes		Phase out of diesel for HGVs, replaced with alternative biofuels			
Stretch (all electric)		EV charging infrastructure is installed	Pool cars are replaced with EV	All small vehicles are replaced with EV	50% of Class III vans phased out and replaced by EV equivalents, smaller EV vans or e-cargo bikes	All remaining vehicles up to 7.5t are replaced with EV	Approximately 25% of HGVs (including RCV) are replaced with EV	Phase out of remaining HGVs with electric equivalents		

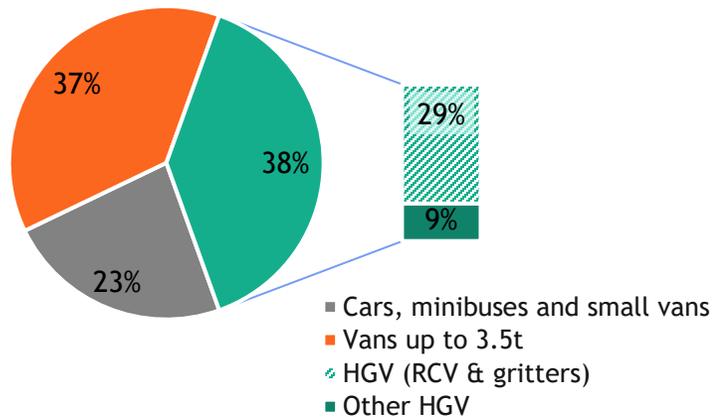
Table 3.2: Columns in the table indicate the types of project completed for each pathway (shown as a row). Class III vans are between 1.74t and 3.5t in kerb weight such as the council’s fleet of Ford Transit vans.

3. EMISSIONS REDUCTION PATHWAYS TRANSPORT – FLEET STRATEGY



The council have already set ambitious plans to decarbonise its owned fleet, in its Draft Fleet Strategy & Action Plan 2022-2030. Our analysis indicates that delivery of targets in the Strategy could ultimately deliver a carbon neutral fleet, depending on the extent to which the council is able to replace existing vehicles with electric equivalents. The pathways shown in Figure 3.4 assess three different scenarios to this end, given the limited availability and feasibility of some electric vehicle technologies for all vehicle types.

The transport pathways consider only vehicles in the council’s owned fleet; grey fleet and other private vehicles used for council operations or on council business are not included under Scope 1 & 2 emissions and accordingly have been excluded from this analysis. The council’s owned fleet contains around 350 vehicles, ranging from pool cars and minibuses to tractors and other heavy goods vehicles (HGVs). Refuse collection vehicle emissions (RCVs) have been excluded from Scope 1 analysis. A breakdown can be found below in Figure 3.6.



Year	Proportion of ICE vehicles replaced
2020/21	2%
2023/24	20%
2025/26	40%
2026/27	75%
2029/30	100%

Figure 3.6: Left: Pie & bar chart showing current composition of internal combustion engine (ICE) fleet vehicles according to Tranman vehicle management system. Right: Table summarising council targets for transitioning away from ICE vehicles, published in the Draft Fleet Strategy.

What are the council’s Fleet Strategy targets?

The following measures from the Draft Fleet Strategy were considered as part of the pathways analysis:

- **Electric vehicle (EV) charging:** the council plans to install EV charging infrastructure in at least five sites by the end of 2023, which could support up to 50 cars and light commercial vehicles (LCVs) within the council’s fleet. The council are also in the process of carrying out a feasibility study across its estate to determine charging capacity and need for EVs and have set the target of giving every council vehicle access to alternative fuel provision by 2029/30.
- **Pool cars:** The purchase of pool cars will be limited to ultra low emissions vehicles (i.e. vehicles with emissions factors <131gCO₂/km) in 2022/23, and will be limited to zero emissions vehicles no later than 2025/26.
- **Vehicle replacement:** The council is targeting the replacement of internal combustion engine (ICE) vehicles with EV, hybrid and other low-emissions drivetrain vehicle types (see table opposite). Currently the proportion of low emission, hybrid and electric vehicles (EV) is around 2% (see Figure 3.6).
- **Transition to smaller vehicles:** It is assumed that in the future the council completes some of its operations with smaller, lower-carbon means of freight transport (such as an increased number of e-cargo bikes or smaller electric LCVs).

The baseline data used for the council’s footprint is from 2020/21, a year significantly impacted by COVID-19 lockdown restrictions. Vehicle mileages were much lower than in a typical year and as a result, pathways have been modelled according to measures relating to fleet composition as opposed to mileage reductions where possible.

3. EMISSIONS REDUCTION PATHWAYS

TRANSPORT – ALTERNATIVE PATHWAYS



What do the pathways assume?

The vehicle replacement targets have the largest influence on future emissions. All three pathways assume a common programme of vehicle replacement, the difference between them being the extent of electrification for different vehicle types. The pathways can be summarised as:

- **(BAU) HGV offsets:** All vehicles under 1.74t are replaced with electric equivalents. Class III vans are replaced with hybrid equivalents. HGVs are replaced with alternative fuels.
- **(Pipeline) HGV biofuels:** All vehicles under 3.5t are replaced with electric equivalents. Vehicles over 3.5t (i.e. HGVs) are assumed to transition onto alternative biofuels. This is set out in the Draft Fleet Strategy.
- **(Stretch) All Electric:** All vehicles and/or operations are transitioned onto electric vehicles.

Earlier years in the pathways prioritise the replacement of smaller vehicles with EV and the development of electric vehicle charge point infrastructure. Medium-sized vans are subsequently prioritised for replacement, with HGVs replaced last. The first RCV is not projected to be replaced until 2026 (when the council's waste contract is also up for renewal).

PV installation and EV charging infrastructure

The council will require investment in charge point infrastructure at its sites if it is to support a significant number of electrified vehicles in its fleet. Grid capacity was highlighted during member workshops as a potential barrier to installing charge points and is a significant challenge to overcome in delivery of an all-electric vehicle fleet. This highlights the benefit of having on-site renewables on council sites to meet growing demand for electricity in the council fleet.

It should also be noted that as a result of the council's commitment to a renewable energy tariff for its electricity, the operational emissions of electric vehicles belonging to the council are zero when charged on council sites.

Treating HGV emissions

Figure 3.6 demonstrates the bias towards larger vehicles in the council fleet - there are over 130 RCVs and other HGVs compared to around 60 cars of various sizes. Data indicates HGVs collectively made up almost half of all fleet emissions in 2020/21 (44%). Historically, low-emission alternatives for heavier vehicles have been unreliable and expensive, posing a major challenge for organisations looking to reduce emissions from these vehicles. More recently, there have been a number of successful trials and alternatives marketed for larger vehicles, such as refuse collection vehicles (RCVs):

- **Load sharing:** It is far easier to decarbonise smaller vehicles than large heavy goods vehicles, and in recent years there has been a large upswing in the market for low-emission light commercial vehicles (LCVs). Spreading freight loads across smaller vehicles is another means of mitigating HGV emissions impact and ties in with broader objectives in the Draft Fleet Strategy.
- **Biofuel replacement:** Forecourt diesel is roughly 7% biofuel, which reduces the emissions created by their consumption. Vehicle fleets with well-defined operational patterns (such as buses and RCVs) have been identified as good candidates for fuel replacement with much higher concentrations of biofuels. This has been shown [at local authority level](#) as well as by [academic studies](#) during on-road testing.
- **Electric RCV (eRCV):** [Some councils](#) in the UK have successfully trialled replacing diesel RCV with eRCVs. This 2020 report from [Eunomia](#) explores the relative benefits of introducing eRCV into vehicle fleets, offering a legitimate alternative to diesel vehicles, even in rural and hilly environments.

3. EMISSIONS REDUCTION PATHWAYS INDICATIVE COSTINGS SUMMARY

Reaching the council’s carbon neutral target will require significant investment, but ultimately offers long-term revenue savings and paybacks. The total cost of delivery for the measures described by the Stretch pathway for buildings and transport is estimated to be approximately £29m, with a further £80.5m required to purchase electric RCVs.

A summary breakdown of these costs according to each measure can be found in Table 3.3. Accompanying methodology notes can be found in Appendix 4.

The majority of projects within the Stretch pathway are taken from the Corporate Carbon Reduction Programme (CCRP) and Draft Fleet Strategy (FS) published by the council. Costings from these documents have been used where applicable.

Where there are gaps in estimates, alternative data have been used to provide a figure instead. In particular this relates to the heating systems retrofit measures in later years of the buildings pathway.

It should be noted that these estimates are not representative of a full business case and are based on broad estimates published in BEES and by the CCC, as well as estimates from council documents and plans. In each case the costings relate to capital expenditure of the project. Estimated payback describes the number of years over which the capital investment is returned due to lower operational costs.

Measure	Capital cost (£million)	Estimated payback (years)	Allocation status
Heating systems retrofit	7.35	12	Not allocated
Demand reduction measures	2.64	5-10	Costed in CCRP - initially proposed for 2020-23 budgets
BMS upgrades	0.50	<5	Not allocated
Behaviour change measures	0.33	<5	Not allocated
Solar PV, hot water and coating	1.30	<5	Costed in CCRP - initially proposed for 2020-23 budgets
Buildings subtotal (£m)	12.12	of which from CCRP (£m)	3.94
RCV replacement*	80.5	-	Draft Fleet Strategy
Vehicle replacement*	15.1	-	Draft Fleet Strategy
EV charge points	1.91	-	Draft Fleet Strategy
Switching to biofuels	-	Additional 10-15% fuel costs	Not allocated
Transport subtotal (£m)	97.50		
Grand total (inc. RCV)	109.62		
Grand total (excl. ECV)	29.11		

Table 3.3: Breakdown of approximate costs to deliver the Stretch pathways for buildings and transport, including the cost to replace refuse collection vehicles. RCVs were not included under Scope 1 emissions.

*Vehicle replacement is expressed in absolute terms, as opposed to an additional capital investment required over replacement for a fossil fuel vehicle.

3. EMISSIONS REDUCTION PATHWAYS

WATERFALL GRAPH

The graph below shows a breakdown of different Stretch pathway measures according to their expected impact on emissions alongside the indicative cost of implementation. The emissions reductions are shown in relative terms between the baseline year of 2020/21 and the goal year of 2029/30.

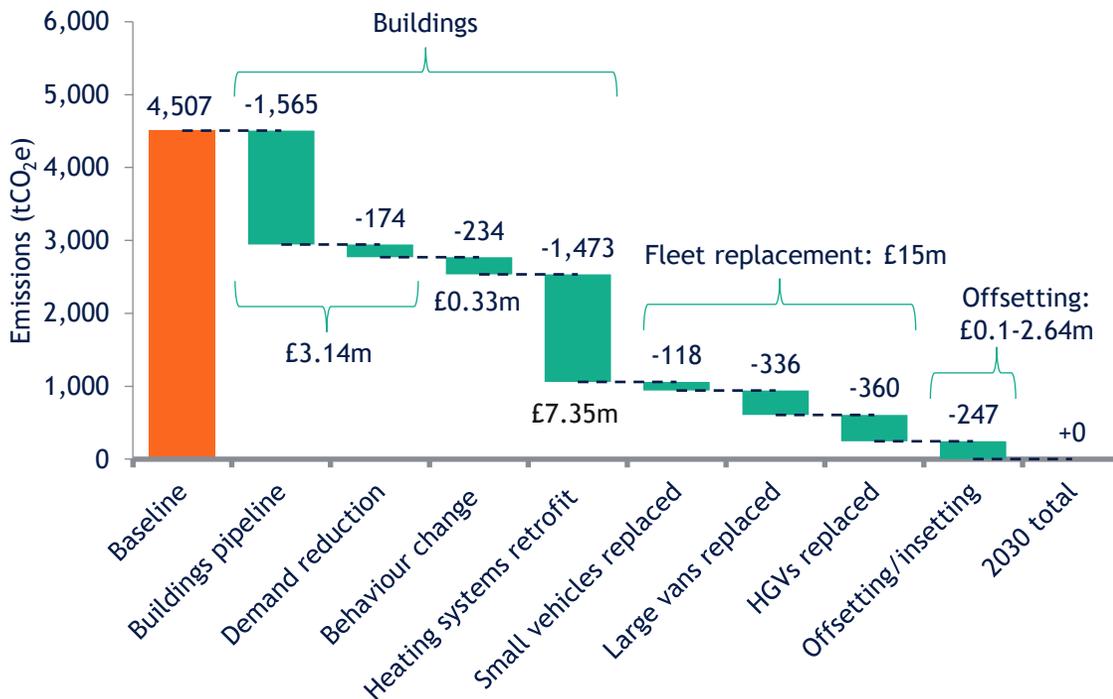


Figure 3.7: Waterfall chart of emission savings for different reduction measures in the Stretch pathway for Wiltshire Council at 2030. The cost of measures which are beyond what has already been committed, or can be achieved by BAU activities, has been included below the measure. The bars are ordered by sector measure and are not linked to the years when measures should be implemented.

- **Buildings pipeline & demand reduction**
These savings estimates relate to projects set out in the Corporate Carbon Reduction Programme. The costings for these projects have been taken from that document and provide a sense of scale for the capital investment required, though higher levels of investment are likely to be required in order to maximise the carbon savings estimated according to BEES.
- **Heating system retrofits**
New projects with the highest potential for emissions reduction comes are heating system retrofits. Using CCC data we have estimated the capital cost of the Stretch programme to give an indicative cost of between £120,000 and £150,000 per project.
- **Transport electrification**
Virtually all of the transport fleet’s emissions are reduced under the Stretch pathway. The cost of replacing non-RCV fleet is estimated to be around £15m.
- **Behaviour change campaign**
Investing in behaviour change and education campaigns internally within the council is likely to bring direct benefit to reducing council emissions but also in educating council staff in reducing emissions more broadly, as well as reducing wider carbon impacts (e.g. in procurement policies and area-wide emissions categories). Estimates have been taken from BEES data.
- **Offsetting/ Insetting**
Under the Stretch pathway there are an estimated 247tCO₂e in residual emissions at 2030. Please see Chapter 4 for more discussion of the cost of abating these emissions to reach the council’s target.

3. EMISSIONS REDUCTION PATHWAYS

DELIVERY RISKS

The delivery of carbon neutrality for the council and the reliance on new projects brings with it various challenges and degrees of risk. Each project will naturally carry its own unique risk profile, but the following list are likely to have material impact across a range of projects:

Constraints to the energy grid

Projects to decarbonise both buildings and transport will require electrification, putting an increased requirement on the local electricity network. Grid capacity is constrained in many areas of the UK, including Wiltshire, which presents a barrier to project implementation. It is recommended the council develop electrification projects to define its additional grid requirements and continue to work with the local District Network Operator (DNO) in order to mitigate this risk. The council should also consider local storage facilities to maximise the potential of local renewables.

In particular, grid constraints are likely to limit near-term activity in certain areas (such as electrification of the council fleet). In this case, grid constraints may limit the installation of EV charge point infrastructure which in turn limits the ability for the council to replace vehicles with electric equivalents.

Funding

As discussed on page 34, the implementation of the Stretch emission reductions pathway will require significant investment. There are several funding streams available including grants such as the Public Sector Decarbonisation Scheme (PSDS).

However, the council may struggle to raise the necessary funds using these traditional methods and are using alternative practices such as using procurement policies to raise funds and alternative non-carbon specific government grants.

Despite engaging with a variety of methods to stimulate investment it is likely funding will be a significant challenge to delivery of decarbonisation projects.

Technology

The costs of different technologies and the availability of skilled workers to deliver projects could be a risk in delivering the emission reduction pathways, especially for innovative or novel projects.

Challenges around grid constraints encouraged the inclusion of more biomass technology in the buildings pathways, though biomass systems themselves carry implications for local air quality and rely on a verified feedstock in order to yield significant carbon savings.

Central Government

Central government has the ability to both help and hinder delivery of the projects described in the emission pathways, through measures such as influencing the availability of funding and implementing new policies. It is important for the council to capitalise on the opportunities made available by central government and challenge barriers within their control.

Although central government have a large responsibility in the UK reaching [Net Zero by 2050](#), it is vital local authorities act with high ambition, through commitments such as Wiltshire's carbon neutrality target.

04 Reaching Carbon Neutral



4. REACHING CARBON NEUTRALITY INTRODUCTION

A successful transition to carbon neutrality for the council will require a range of ambitious emissions reduction measures, discussed in Chapter 3. The emissions remaining in 2030 after reduction projects have been achieved are termed *residual emissions* and are visualised in Figure 4.1 for the Pipeline and Stretch pathways. The rest of this chapter discusses options available to the council in terms of treating these residual emissions; in each case the cost and effort required to offsetting these emissions are dependant on the amount of residual emissions retained by the council in 2030.

What might the council footprint look like in 2030?

In order to estimate the potential quantity of emissions that will remain in 2030, we have considered two scenarios; the successful delivery of the Pipeline pathways and the successful delivery of Stretch pathways.

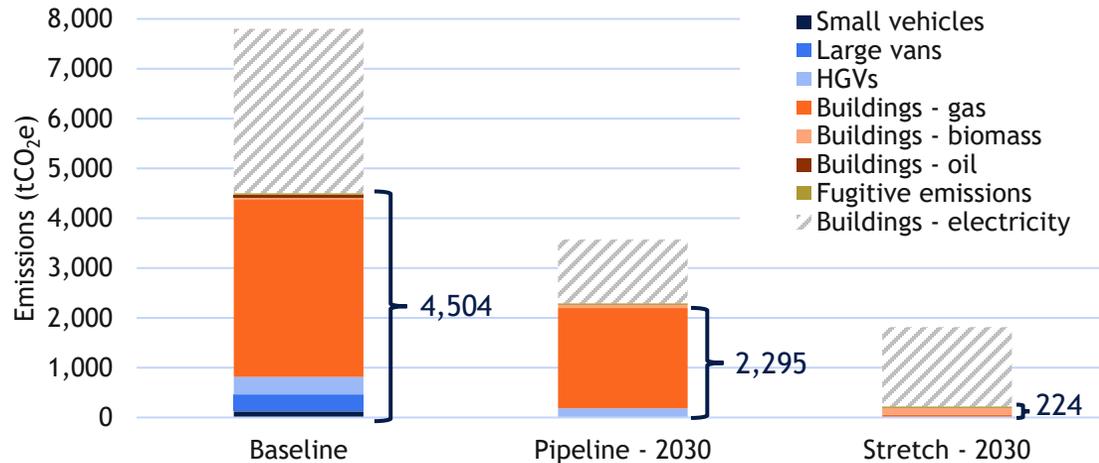


Figure 4.1: Potential quantities of residual emissions dependent on extent of decarbonisation programmes. Hatched area indicates the equivalent scale of Scope 2 electricity emissions that are presently treated as zero under a market-based approach with a green tariff.

Emissions Reduction Hierarchy

Council emissions should be treated with respect to the emission reduction hierarchy (Figure 4.2) where offsetting is a last resort measure. Where possible, emissions should be prevented in the first instance. This allows emissions removal measures, such as tree planting, to be used to draw down historic emissions.

Whilst direct emissions reduction measures should be prioritised, it is also likely that despite best efforts some emissions will remain at 2030, given the hard-to-treat nature of some emissions, such as those in the HGV fleet or in buildings where retrofit projects may be limited.

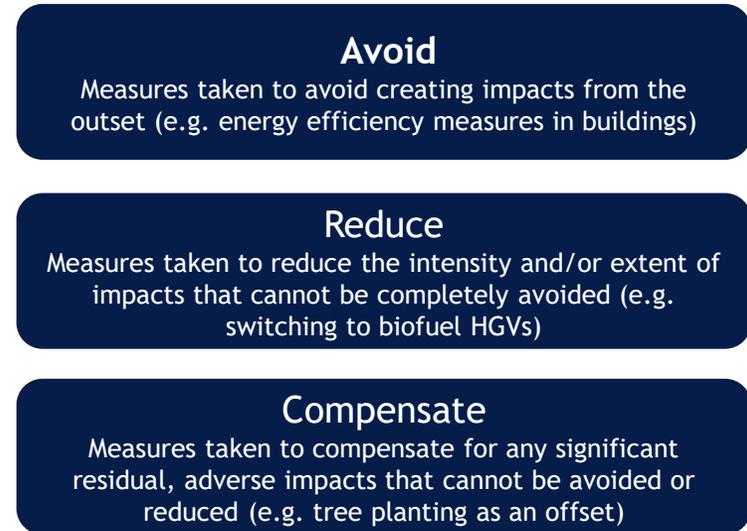


Figure 4.2: Diagram of a generalised emission reduction hierarchy, as presented by the [WWF](#).

4. REACHING CARBON NEUTRALITY INTRODUCTION

Carbon offsetting

Traditionally, carbon offsetting refers to the purchase of a tradeable unit which represents an emissions reduction, which balances the climate impact of an organisation, activity or individual. There are different varieties of offsets, namely:

- **Carbon removal offsets** support projects that physically draw carbon out of the atmosphere. Examples include nature-based solutions such as tree-planting, carbon capture and storage (CCS) and negative emissions technologies (NETs).
- **Carbon avoidance offsets** support projects that prevent carbon which otherwise would have been released into the atmosphere. Examples include installing renewable energy or preventing deforestation.

The principles of offsetting can also be applied beyond just the purchase of carbon credits, and many local authorities are now exploring opportunities to support decarbonisation initiatives more locally. This can help to tackle some challenges inherent in the purchase of carbon credits - these are explored further on page 41.

We have considered three offsetting options to treat the council's residual emissions. These are not mutually exclusive, and the council may choose to apply more than one in seeking to make the final step to carbon neutrality.

1. Market-based Offsets: Purchasing verified UK carbon credits from the Woodland Carbon Code and/or the Peatland Carbon Code (see page 40)

2. Local Offsets:

- a) **Nature-based solutions:** Delivery of nature-based offsetting projects **locally**, such as through tree planting initiatives (see page 42)
- b) **Authority Based Insetting (ABI) projects:** Where the council supports delivery of carbon reduction or avoidance projects within the county. This includes projects such as retrofitting local housing and local energy installations. This could be achieved via Anthesis' **Authority Based Insetting (ABI) framework** (see page 43 and Figure 4.3)

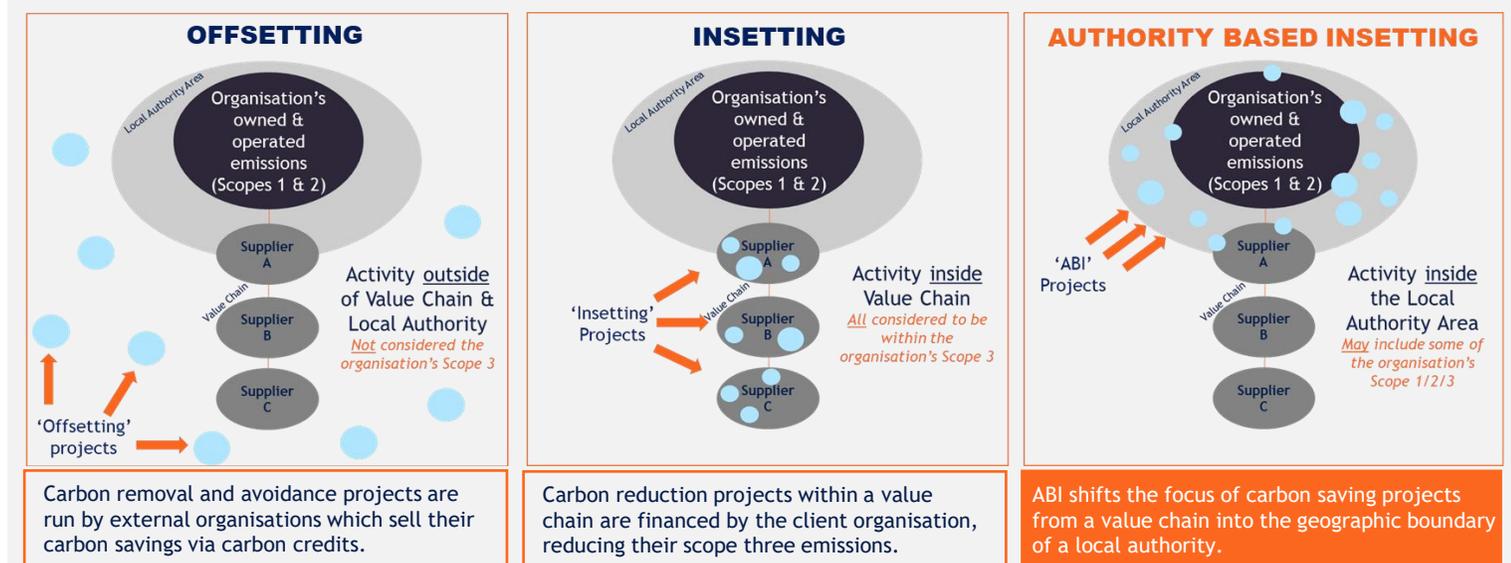


Figure 4.3: Diagram of authority-based insetting compared to traditional offsetting and insetting practices.

4. REACHING CARBON NEUTRALITY

MARKET BASED OFFSETS

Purchasing UK Credits

The current cost of [Woodland Carbon Code credits](#) are between £7-£20 per tCO₂e, excluding additional administration fees. These prices depend on the costs of creating and managing the woodland and any co-benefits the project may provide. The costs of voluntary carbon credits are extremely liable to change; their costs have increased over the last year (Table 4.1) and research by [Trove Research and UCL](#) predict further increases in the next 20 years, rising to £38 per tCO₂e in 2030.

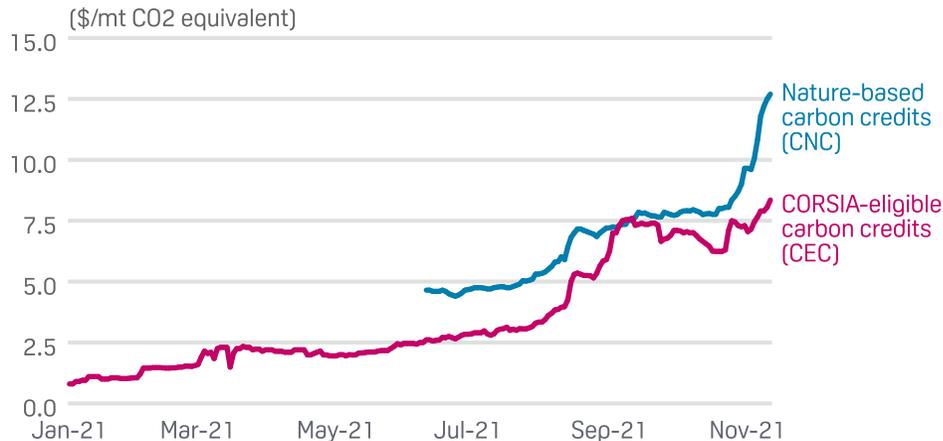


Figure 4.4: Fluctuating costs of voluntary carbon credits in 2021.

Offset amount required (tCO ₂ e/year)	Current annual cost to offset	Predicted annual cost in 2030 to offset
Stretch - 224	£3,000	£9,000 - £24,000
Pipeline - 2,295	£31,000	£87,000 - £241,000

Table 4.1: current and predicted cost to offset the Stretch and Pipeline pathways.

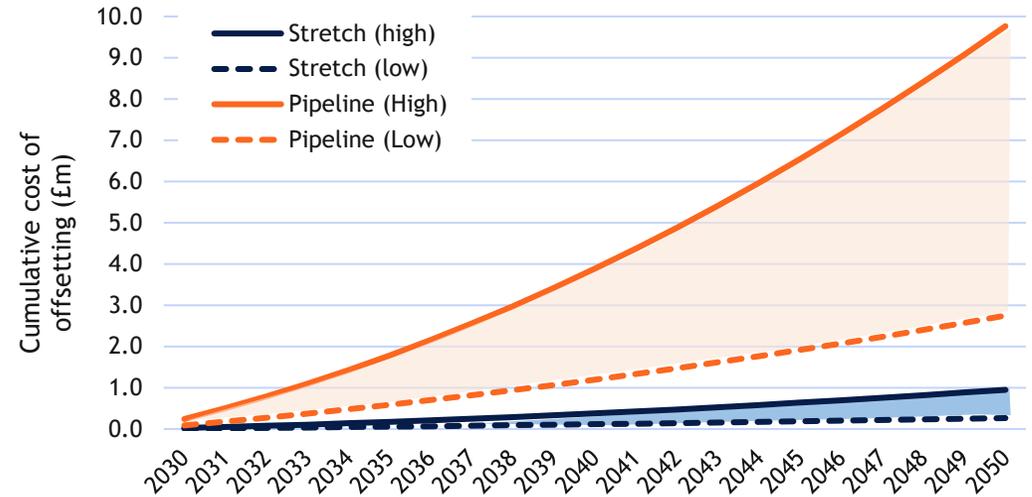


Figure 4.5: Indicative cumulative costs of offsetting residual emissions for the stretch and pipeline pathways. The shaded area denotes the potential range in offset costs in both cases.

Figure 4.5 shows the cost of offsetting given a high prediction of costs via the [Department of Energy and Climate Change](#) and a lower prediction using the [Trove Research and UCL](#) research for remainder of residual emissions from both Pipeline and Stretch pathways. As dictated by the large variance in values, the carbon market is extremely difficult to forecast; by choosing to simply purchase offsets the council will be subject to carbon price fluctuations in a volatile market.

It is important to note that the number of accredited offsetting projects in the UK is limited and as a result there may not be enough credits available to purchase. Increased demand for UK credits may drive prices beyond the indicative costs in Figure 4.5. Local authorities also face unique challenges when exploring the purchase of carbon credits. These are explored further overleaf.

4. REACHING CARBON NEUTRALITY

MARKET BASED OFFSETS: CHALLENGES

We have observed some common challenges and concerns that the UK public sector face when using ‘traditional’ market-based offsets. These include:

Increasing public scrutiny: The public is becoming increasingly “carbon literate”, in large part due to the mainstreaming of the climate emergency via school strikes and increased media coverage. This means that issues around quality (including additionality, permanence, and verification) of offsets still exist and are receiving greater scrutiny by the general public than ever before. Combined with the fact that it is taxpayer’s money that will be spent, councils’ offsetting activity is likely to attract significant public attention.

Difficulty in retaining co-benefits locally: Unlike corporates, local authorities need to demonstrate a social return on money invested, such as an increase in jobs and improved health, within the area that they serve. This is difficult to achieve using existing certified offsetting schemes, as they commonly relate to projects outside of the local authority and/or outside of the UK.

Lack of taxpayer choice: Unlike the consumers of a business’ products or services, whose purchasing decision may be influenced based on what type of socio-environmental cause they wish to support, taxpayers do not get a direct choice as to how their money is invested, i.e. residents cannot choose to not pay council tax based on the council’s sustainability credentials.

Lack of international relevance: Many businesses may select an offsetting scheme based on the relevance to their global supply chains, consumer markets or alignment with other unique social values and causes. While councils may still have extended supply chains, their purpose has an inherently local focus, so it is much harder for them to justify diverting socio-economic co-benefits internationally, relative to corporates.

Limited options available in the UK: Existing carbon neutrality standards such as PAS 2060 require ‘certified’ offsets to be used. However, the range of UK options is currently limited (i.e., the Peatland Code and Woodland Carbon Code). Also, with an increase in demand for UK projects, these schemes are becoming more expensive.

Current certified offsets do not offer a financial return on investment: Most conventional offsetting schemes require an annual investment with no direct financial payback. This contrasts with more ‘direct’ emissions reduction measures applied within an organisation that can offer a financial return through reduced energy or fuel costs. While insetting projects are slightly further removed than direct, internal projects, they still have the potential to better connect the investor to the beneficiary. This may offer an opportunity for the investor to share some of the financial, reputational and carbon saving benefit.

Limited supply and impact of UK certified options: Current options for certified UK schemes are ‘nature based’, i.e. tree planting and peatland restoration. While these are tremendously positive activities that offer a raft of co-benefits in addition to carbon removal, it is important to recognise the scale of the carbon reduction challenge still needed across other emissions sectors, such as transport, energy, and buildings. Therefore, even with radical investment in nature-based solutions, there may not be enough projects and savings on offer within the county boundary, and even the UK as a whole, to bridge the ‘gap’ to neutrality. Therefore, other types of emissions saving projects may still be required.

As a result, many local authorities are now seeking to focus their investments inwardly on more local offsetting initiatives.

4. REACHING CARBON NEUTRALITY

LOCAL OFFSETTING PROJECTS: TREE PLANTING

Nature-based solutions

To avoid some of the challenges faced with purchasing carbon credits, nature-based projects can be run in-house by councils, with the following common benefits and challenges:

Benefits	Challenges
<ul style="list-style-type: none"> Social and biodiversity benefits retained locally Can be validated and verified by the Woodland or Peatland codes Potential to generate a source of income by trading excess carbon savings 	<ul style="list-style-type: none"> Risk of disease or damage to trees which invalidates carbon savings Verification can be time consuming and costly, without which claimed savings may come under scrutiny Trees must be planted years in advance of “claim date” in order to reach requisite maturity to sequester enough carbon Woodland will require continued maintenance to be financed through its lifetime

Approximately 900 hectares of trees would be required to be planted before 2024 to fully offset Wiltshire Council’s Pipeline residual emissions by 2030 (Table 4.2). Planting this area of trees would require capital investment of up to £7.65m, though government subsidies can cover a large proportion of this cost.

Trees must grow sufficiently (c.10 years, see Figure 4.6) before they can reliably be used to claim carbon savings. Carbon savings should only be claimed for carbon sequestered by the trees as they grow, as opposed to claiming savings “in advance” before the trees reach maturity. This can pose challenges, since the council is unlikely to accurately predict its residual emissions six years out from the 2030 target date. Further, the ongoing cost of planting and maintenance may prove significant to meet the required emissions threshold. The cost estimates provided here represent un-subsidised programmes; schemes such as the England Woodland Creation Offer can lower this capital cost significantly.

Since carbon storage from planted trees peaks c. 20 years after being planted, this means that tree planting offers a cost-effective long-term solution to eliminating residual emissions and diminishes the need for purchased carbon credits in later years.

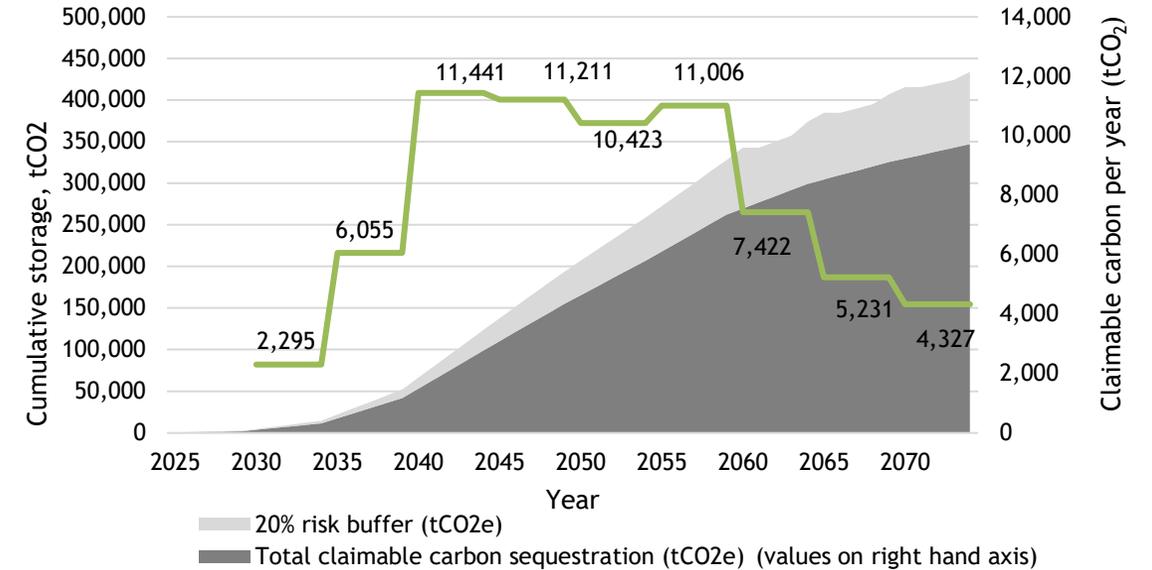


Figure 4.6: Cumulative carbon storage for 900ha of the Woodland Carbon Code(WCC) mixed native woodland planting scenario. Trees planted in 2024 with the WCC recommended 20% buffer to allow for any uncertainty in the modelled predictions. The claimable carbon per year is shown on the right-hand axis.

Emissions scenario offset (tCO ₂ e)	Approximate hectares of trees required (planted by 2024)	Equivalent number of trees	Estimated cost (£m)
Stretch: 224	88	140,800	up to 0.75
Pipeline: 2,294	900	1,438,400	up to 7.65

Table 4.2: The estimated areas of tree planting required for both the stretch and pipeline emission reduction pathways, the area of trees is highly dependent on species planted and spacing. Costs based on data from the Woodland Creation & Maintenance Grant and excludes land values.

4. REACHING CARBON NEUTRALITY

LOCAL OFFSETTING PROJECTS: CARBON INSETTING

Carbon Insetting

In a corporate context, carbon insetting refers to offsetting investments targeted within a business' value chain, as opposed to outside it. In a local authority context, the investment boundary is shifted from within the value chain to the local authority boundary (Figure 4.3).

Anthesis is currently developing an [Authority Based Insetting](#) (ABI) mechanism through which local authorities can identify “insetting” projects, attract finance for projects and effectively measure and report project impacts. Insetting provides an alternative local solution to offsetting, should the council face challenges in delivering in-house projects. Tables 4.2 and 4.3 opposite outline the differences between insetting and offsetting, as well as potential benefits and risks associated with their usage.

This methodology broadens the range of projects to include novel and unique solutions e.g., reducing agricultural methane emissions or increasing active travel. In-progress examples of insetting projects are varied across renewable energy projects, retrofit pilots in domestic and commercial buildings, and nature-based projects. More details can be found in the linked report above.

Insetting is a means through which the council can address its residual emissions whilst minimising some of the challenges described on page 41. The council could deliver insetting projects within the county, or work with other local stakeholders (community groups, local businesses and NGOs) to identify and fully or partially fund projects in return for a claim on the achieved carbon savings. These savings would be reported alongside the council's emissions profile and net off residual emissions.

Offsetting	Insetting
<ul style="list-style-type: none"> Projects commonly ‘detached’ from organisation & supply chain Tradable on global market 3rd party broker required for purchase High dependence on certification schemes No payback or return on investment (ROI) Projects readily available 	<ul style="list-style-type: none"> Projects embedded within an organisation’s supply chain or for a local authority, their geographic location. Not readily tradable No broker required, can be a simple transaction between 2 parties No dependence on certification schemes Potential for payback and ROI Projects require identification

Table 4.2: Table summarising the differences between offsetting and insetting.

Benefits of insetting	Challenges of insetting
<ul style="list-style-type: none"> Social and biodiversity benefits retained locally Protection against greenwashing Closer relationship with local stakeholders who collaborate on projects No formal verification requirements can save money spent on costly certification procedures, provided the council can robustly internally verify savings 	<ul style="list-style-type: none"> No formal verification requirements can increase risk of double-counting savings and inaccurate reporting Costs are uncertain from project to project in terms of the capital investment required to claim a defined unit of carbon savings i.e., the £/tCO₂ value may vary between ABI projects Lack of measurement tools to quantify emissions savings Council involvement in local projects may require ownership of additional financial and delivery risks compared to market-based offsetting

Table 4.3: Table summarising common benefits and challenges associated with insetting.

4. REACHING CARBON NEUTRALITY OTHER STRATEGIES

Sale of Assets

The sale of assets, such as buildings, reduces the council's Scope 1 and 2 emissions due their transferral out of its organisational boundary.

Historically, asset transfers have been completed locally within Wiltshire primarily to enable greater community ownership of land as well as to more efficiently use building space. In both cases, subsequent reductions in emissions from the council's footprint is a positive secondary benefit. In such cases, it is encouraged that the council support the new asset owners to continue to pursue low-carbon initiatives and projects.

Whilst offering the potential to deliver local benefits, the sale of assets purely as a means of reducing emissions can also bring with it some concerns:

- **Area-wide context:** emissions transferred out of the council's footprint through asset sales are likely to remain in the area-wide emission profile, which the council has also committed to reduce as much as possible.
- **Loss of influence/control:** asset transfer can surrender any control or influence over the assets, reducing opportunities for the council to make impact and making it harder to reduce area-wide emissions.
- **Public perception:** the use of asset transfers as a means to reduce carbon footprints has been criticised as greenwashing in the past, especially in cases where the assets sold are then rented back to the original owner.

The council should be conscious of these concerns in future and work to ensure that asset sales continue to support other positive local benefits as is the case presently (e.g., community ownership, efficient use of space), as opposed to the primary motivation for asset sales being emissions reduction.

Service Delegation

The delegation of services (e.g., from Wiltshire Council to parish councils) can also transfer emissions out of the council's organisational boundary. Similarly to asset transfers, it is recommended that the delegation of services is not motivated solely by the removal of emissions from the council's footprint.

It is recommended that GHG emissions are considered and discussed as a part of any service delegation, with the aim of achieving an overall reduction of emissions within the county.

Insourcing and changes to service contracts

This report has focused on mitigating current emissions, however council activities and purchases could add additional emissions from other sources - such as the decision to insource different services and assets (e.g., waste operations and social care homes). There is recent precedent for this following the addition of leisure centres to the council's portfolio in 2021. Activities or purchases that will transfer or add emissions to the council's Scope 1 & 2 footprint should be recognised in annual emissions reporting, with their impact clearly defined and understood.

This can be managed through ensuring emissions are considered as a part of project feasibility stages and procurement decisions and links back to our recommendation for improved visibility of supplier emissions. Ambitious emission reductions in existing sites covered by Scope 1 will also provide increased flexibility to manage any additional emissions from operational boundary changes.

Although some decisions are likely to increase Wiltshire Council's associated emissions; they can also allow the council to have greater control and facilitate a reduction in overall county emissions. Therefore it is recommended that decisions on insourcing that increase emissions are considered on a case-by-case basis; where large county savings can be made it may be beneficial to bring these emissions into scope.

05 Conclusions & Recommendations



5. CONCLUSIONS & RECOMMENDATIONS

OVERVIEW

This report sets out a roadmap to carbon neutrality by 2030 for Wiltshire Council, outlining the measures that need to be achieved, and when they should be implemented, for the council to achieve its target. Our analysis is based on consideration of the cumulative impact of a range of emissions reduction projects and initiatives across its Scope 1 & 2 activities. These savings have been categorised into: savings to be expected should the council take no action, savings from the council's current planned activities, and savings also including a set of "stretch" activities the council will need to implement. We also provide recommendations to improve future data management. The results are intended to act as an evidence base against which the council can plan further action to achieve carbon neutrality. The analysis indicates that carbon neutrality can be achieved by 2030 with a robust set of actions and using carbon offsets to tackle any residual emissions.

Reaching carbon neutral

Our analysis highlights the importance of the continued application of all carbon reduction measures currently planned by the council, termed as "Pipeline". But these measures alone are not enough to achieve carbon neutrality, and the council must now explore what is needed to go further. The council will need to:

Implement the measures outlined in the "Stretch" Pathway:

- **Buildings:** after 2023/24, the council should deliver additional projects, prioritising heating system retrofit and energy demand reduction.
- **Transport:** after 2023/24, the council should work to phase out all internal combustion engine vehicles in its fleet, switching to electric vehicles.

Measures within the Stretch pathway have been estimated to cost just over £29m in total capital expenditure, with a payback period of 12-15 years. The analysis has primarily been reported under a market-based approach in order to reflect the council's green electricity tariff.

This means that emission savings from the council's on-site power generation is not illuminated within the figures, as all electricity purchased is considered zero carbon and therefore the reduction in electricity demand from power generation is not visible. However, renewable energy generation does have a material impact and can be observed in the location-based analysis, as shown in Appendix 3.

Renewable energy generation should be explored not only to reduce location-based emissions but also to address constraints in grid energy supply which could emerge in switching to electrified measures (such as electric heating and vehicles), and to protect the council against volatile energy prices.

Address any residual emissions through offsets

A range of options has been explored to manage residual emissions, including the purchase of UK based carbon credits, running in-house tree planting projects, engaging in insetting projects within the county and the risks of using asset transfers to reduce emissions.

Our analysis highlights the importance of ambitiously reducing current emissions in order to limit amount of residual carbon remaining in 2030 and the accompanying operational and financial risk their management will entail. This can be shown in the difference in predicted yearly offsetting costs in 2030; the Pipeline scenario costing from £87,000 per year while the Stretch scenario costs from £8,000 per year.

Mitigating residual emissions with tree planting will require projects to begin by 2024, to enable the trees to reach maturity to sequester carbon. Our estimates indicate a planting area up to 9km² will be required. It is recommended that an offsetting plan is developed, considering a mixture of these solutions to balance their benefits and risks.

5. CONCLUSIONS & RECOMMENDATIONS

RECOMMENDATIONS

To achieve the council's target of carbon neutrality by 2030, we recommend the council now leverage the insights provided by this report in a number of ways:

Continue to strengthen its reporting and monitoring

- **Implement data recommendations:** Continue the valuable monitoring and reporting of emissions and implement the guidance provided in this report to improve the value and insights of the data. These actions will enable the council to measure progress towards the target of carbon neutrality and track the impact of all carbon reduction measures. The guidance provided on managing the council's emissions data is intended to support the council in reporting emissions in the future that are aligned to best practice guidelines and enable the delivery of high impact emissions reductions.
- **Complete calculation of Scope 3 emissions:** Undertake a full assessment of the council's Scope 3 emissions, including an assessment of the impacts of the council's value chain. A Scope 3 baseline is an important step that can inform future decisions on potential service/contract insourcing and asset transfers.

Translate plans into discrete actions

- **Move into delivery planning:** This report details *what* measures need to be implemented, and when, for the council to achieve carbon neutrality. Officers across the council should now explore producing a detailed delivery plan detailing specific steps to be taken. Actions should prioritise high impact projects like heating systems retrofit and energy demand reduction in buildings, and EV charge point infrastructure and vehicle replacement in the council's fleet. A strong pipeline of work is already in place, and the council has already demonstrated plans to reach carbon neutral in key operations through documents such as the Draft Fleet Strategy.

Given that the measures to achieve the pipeline pathway are mostly already in place, the delivery plan following this report should focus on "Stretch" pathway measures.

- **Work to centre climate in council operations:** Coordination across the council will be required to ensure sustained implementation of these measures, and to drive behaviour change focused measures. There is a requirement for strong policies and processes which are likely to cut across existing measures. In designing new projects, the council should consider specific working groups under different delivery themes and assign responsibility for actions across departments. It may also be beneficial to review the council's governance processes to ensure carbon reduction is suitably prioritised.
- **Remain open and flexible to existing and innovative funding:** Wiltshire Council has in the past been successful in applying for funding to support decarbonisation (such as the Public Sector Decarbonisation Scheme). These applications for funding should be continued and alternative funding mechanisms, such as through procurement policy or alternative grants, explored to support financing carbon reduction initiatives in the council.

Communicate clearly on residual emissions

- **Create an offsetting strategy:** It is highly likely that the council will have to abate residual emissions in 2030. The council should consider the different forms of offsetting discussed in this report and identify which methods it wishes to pursue as part of an offsetting strategy. If using local tree planting as an offsetting measure, the earlier trees are planted the more carbon they will be able to offset from 2030 due to their delayed carbon sequestration potential. This report suggests a planting date no later than 2024 to ensure that trees reach maturity to sequester significant carbon.

Appendices

APPENDIX 1

SCOPE 1, 2 & 3 EMISSIONS

The tables on this page shows a full list of emissions data assessed as part of this report. These data were sourced from a combination of council sources; most notably the Local Government Association (LGA) footprinting tool.

Emissions Source	Emissions (tCO ₂ e)
Scope 1	4,506
Natural Gas	3,567
Fleet	819
Burning oil - kerosene	9
Gas Oil	50
Wood pellets	26
R410A (refrigerant)	32
R407c (refrigerant)	3
Scope 2	4,862
Electricity - building use	2,616
Electricity - streetlighting	2,246
Scope 1 & 2 total	9,369
Scope 3 (selected sources)	
Electricity T&D	418
Gas WTT	464
Staff travel	692
Procured goods and services	269,212
Waste	2
Schools - gas	3,644
Schools - electricity	2,076

Fleet Scope 1	tCO ₂ e
Small vehicles	123
Diesel van Class III	336
HGV	360
Fleet Total	819

Procured goods and services emissions	
Industry sector - top 10	Emissions (tCO ₂ e)
Health & social work	83,012
Road transport	59,842
Sewage & refuse services	53,142
Construction	22,734
Mains electricity*	17,765
Legal, consultancy & other business activities	7,395
Other service activities	5,975
Banking & finance	4,723
Education	4,518
Computer services	1,584
All other sectors	8,523

*Electricity emissions were not shown in Figure 2.4 and 2.5. This is to reflect the fact that the council's green tariff means that application of a grid-average emissions factor for electricity is inaccurate, but is a function of the methodology applied.

Procured goods and services emissions	
Contracts - top 10	Emissions (tCO ₂ e)
Waste contracts	47,484
Highways contracts	38,035
Adult residential placements - spot purchases	21,532
Transport contracts	21,268
Electricity*	17,765
Supported living	11,174
Buildings minor alterations	10,516
Adult domiciliary care	8,131
Adult care nursing placements	6,264
Property maintenance	5,915
All other contracts & services	81,128

WTT and T&D emissions

Well-to-tank (WTT) emissions occur upstream and are associated with extraction, refining and transportation of the raw fuel sources to the council prior to use.

Transmission & Distribution (T&D) emissions are associated with grid losses; the energy loss that occurs in getting the electricity from the power plant to council sites.

APPENDIX 2

PATHWAYS METHODOLOGY NOTES

How were projects assessed for carbon reduction potential?

An estimate for the carbon reduction potential of pipeline projects was made according to the type of project and the building where it was carried out. These estimates were taken from the Building for Energy Efficiency Survey (BEES) 2014-15, which is the same body of research used by the Committee on Climate Change to assess carbon abatement potential in the Sixth Carbon Budget report. The BEES survey records the potential energy demand reduction that can be achieved by completing different projects. The survey is also sensitive to different building types i.e., LED upgrades in an office vs. a retail space garner different results on account of their differing energy consumption profiles.*

What if multiple projects of the same type are completed at the same site?

Projects within BEES are grouped under common themes, or sub-categories. These sub-categories group together similar activities e.g., the sub-category “building fabric” includes retrofit projects for different technologies.

Some of the council’s pipeline projects overlap within sub-categories e.g., window and door glazing and insulation are both listed under “building fabric” improvements in the BEES survey. If one project within a BEES sub-category is completed, it has been assumed that yields the maximum potential energy demand reduction, according to that sub-category’s rating in BEES. The energy savings from projects of the same type are then capped if more than one measure is completed within a given project sub-category.

*For example, an LED replacement project in an office building was projected to deliver a 6% reduction in overall energy demand; a BMS upgrade in a leisure centre was projected to deliver a 7% reduction in demand. The BEES research, alongside its full methodology report, can be found at:

<https://www.gov.uk/government/publications/building-energy-efficiency-survey-bees>

BEES statistics reflect the maximum *potential* abatement as a result of a given project type being completed; real-life energy demand reductions cannot be properly verified until after the project has been completed.

It should also be noted that this limitation only applies to projects within the same BEES sub-category and does not discount savings from different project types being applied to the same category e.g., a building fabric upgrade and a building instrumentation/control project both independently garner energy reductions.

For some projects, carbon savings were provided by the council. These were not directly included in this research on the basis that:

- Carbon savings were not available for all projects, meaning further estimates would be needed anyway, and a consistent approach to these was favoured
- It was not clear in all cases whether figures represented annual or lifetime savings
- The future modelling of projects still in development requires an assumption to be made on its impact on emissions
- The BEES survey data describes energy demand abatement *potential*, offering an aspirational upper limit for the successful delivery of different demand reduction measures
- The BEES survey data also allows for better comparisons between measures and building types (i.e. carbon savings from a project installed in an office block may not garner similar results in a leisure centre).
- Carbon savings provided by the council were instead used a sense check for the methodology.

Carbon savings as shown on the waterfall graph (Figure 3.6) have been estimated by direct comparison between two case studies where possible, and approximated where this has not been possible.

APPENDIX 3 GREEN TARIFF

The council’s green tariff means that a significant portion of its Scope 1 & 2 footprint (52%) can effectively be treated as zero under a market-based approach.

This is evidently a major asset to the council in its journey to becoming carbon neutral and were it not the case the council operated a green tariff, it would form a central part of our pathways recommendations to do so.

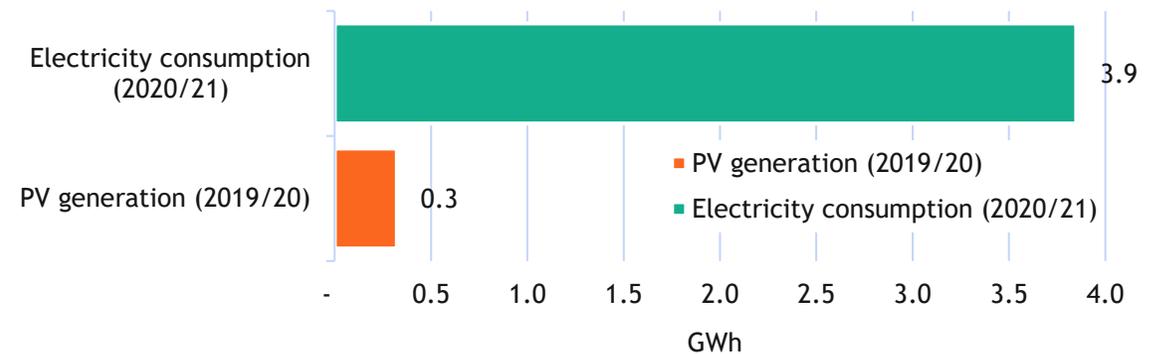
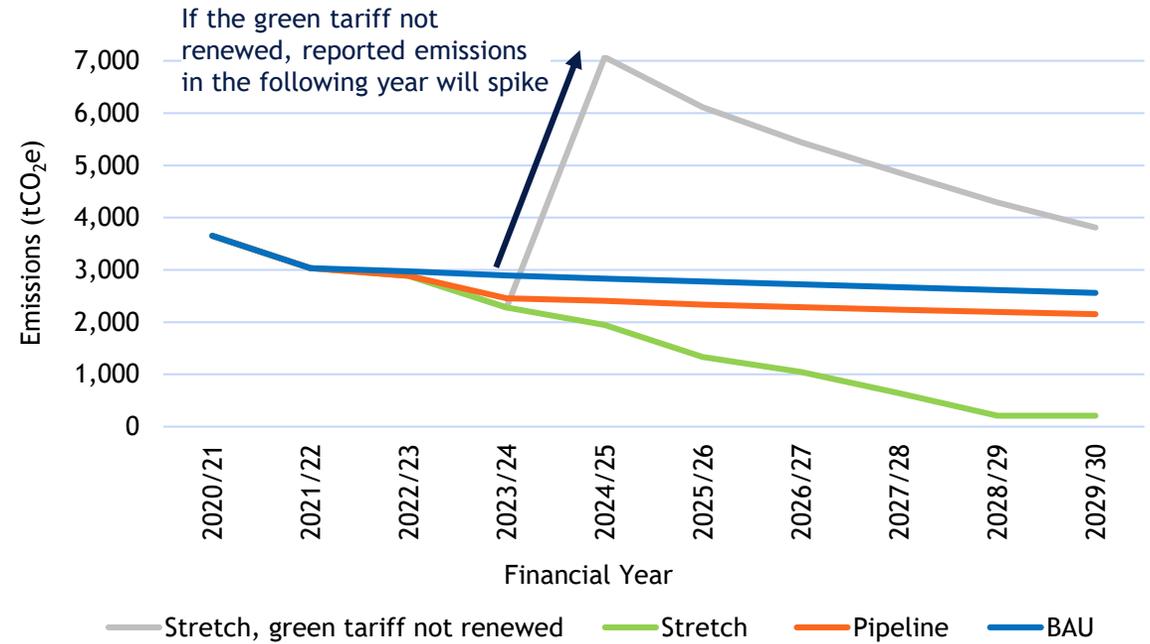
What happens if the council does not renew its green tariff?

The graph opposite has been included to demonstrate the adverse impacts on council efforts to become carbon neutral in the event that the green tariff is not renewed. In the graph opposite (the built environment pathway) the emissions currently set to zero under the green tariff are “switched back on” in an example future year.

Even under the Stretch pathway, with all other projects successfully implemented (demand reduction, behaviour change, heating system retrofit) the emissions from buildings in 2030 are essentially equivalent to the baseline year with the green tariff applied. If the green tariff is not renewed, this would mean that the council’s electricity usage is recorded as a carbon source under the market-based approach, whilst it is currently considered functionally zero - in effect doubling its footprint.

Impact of solar PV

We can also consider the positive impact of local generation from PV. The chart opposite shows the proportion of electricity consumption that was met by at sites included in the council’s Scope 1 emissions **only**. Locally-generated electricity is enough to meet roughly 8% of overall demand at sites that were listed on the council’s Scope 1 register.



APPENDIX 4

COSTINGS METHODOLOGY NOTES

Measure	Capital cost (£million)	Estimated payback (years)	Allocation	Method Notes
Heating systems retrofit	7.35	12	Not allocated	<ul style="list-style-type: none"> - Additional heating system retrofits costed according to CCC data and the number of projects in the Stretch pathway - £0.75m was assigned in the CCRP to biomass boilers across six projects; these estimates indicate a similar cost per-project (£0.12m-£0.15m) depending on heat pump or biomass installation
Demand reduction measures	2.64	5-10	Costed in CCRP - initially proposed for 2020-23 budgets	<ul style="list-style-type: none"> - Relates to capital expenditure of all assessed projects for which costings are listed in the CCRP
BMS upgrades	0.50	<5	Not allocated	<ul style="list-style-type: none"> - Estimates derived from BEES study (£ spent/Wh abated) and consumption data
Behaviour change measures	0.33	<5	Not allocated	<ul style="list-style-type: none"> - Estimates derived from BEES study (£ spent/Wh abated) and consumption data
Solar PV, hot water and coating	1.30	<5	Costed in CCRP - initially proposed for 2020-23 budgets	<ul style="list-style-type: none"> - Cost of grid infrastructure not included as part of this figure
Buildings subtotal (£m)	12.12	of which CCRP (£m)	3.94	
RCV replacement	80.5	-	Draft Fleet Strategy	<ul style="list-style-type: none"> - RCVs are not included under Scope 1 emissions - Cost is absolute value of replacement (as opposed to marginal cost over a fossil fuel equivalent)
Vehicle replacement	15.1	-	Draft Fleet Strategy	<ul style="list-style-type: none"> - Cost is absolute value of replacement (as opposed to marginal cost over a fossil fuel equivalent)
EV charge points	1.91	-	Draft Fleet Strategy	
Switching to biofuels	-	Additional 10-15% fuel costs	Not allocated	<ul style="list-style-type: none"> - Cost is taken as the additional pump price of HVO fuel over diesel
Transport subtotal	97.50			
Grand total (inc. RCV)	109.62			
Grand total (excl. RCV)	29.11			

Costings within the Corporate Carbon Reduction Programme (CCRP) have in practice proven higher than these estimates. As part of full delivery, business cases would need to be developed for each project; figures quoted here are intended to serve as indicators only.

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