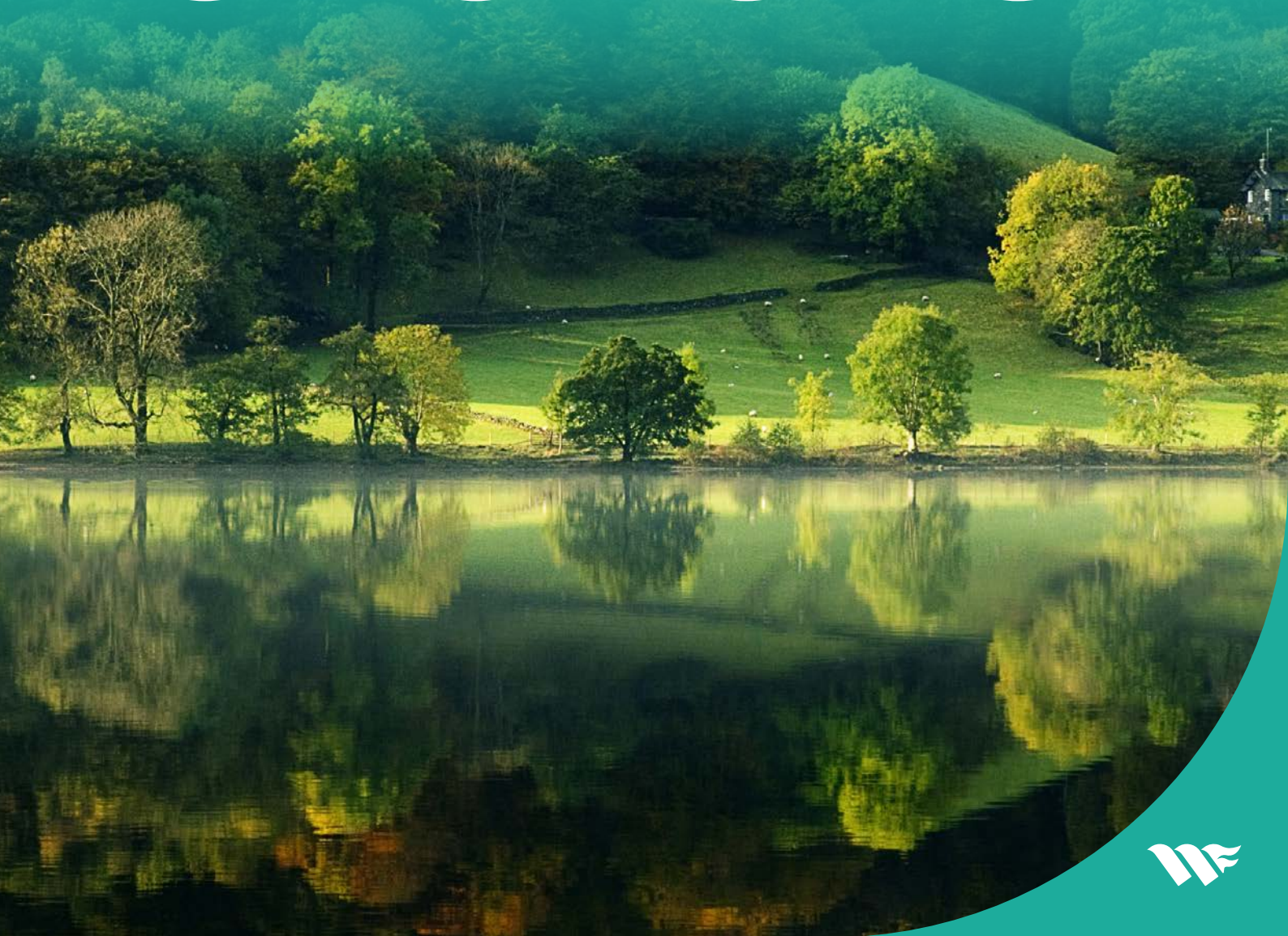




Westmorland  
& Furness  
Council

# Carbon Management Strategy

2024-2029



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## Glossary

Acronym	Meaning
AC	Air Conditioning
AHU	Air Handling Unit
ASHP	Air Source Heat Pump
BMS	Building Management System
CAFS	Cumbria Action for Sustainability
CES	Clean Energy Strategy
CLEP	Cumbria Local Enterprise Partnership
DHW	Domestic Hot Water
EV	Electric Vehicle
GHG	Green House Gas
HVAC	Heating, Ventilation and Air Conditioning
HVO	Hydrotreated Vegetable Oil
IPCC	Intergovernmental Panel on Climate Change
PV	Photovoltaic
tCO <sub>2</sub> e	Tonnes of Carbon Dioxide Equivalent

## Definitions

**Carbon Neutral** - This is the position where the CO<sub>2</sub> released by an organisation is balanced by an equivalent amount being removed or mitigated.

**CO<sub>2</sub>e** - A quantity that measures the global warming potential of any mixture of greenhouse gases using the equivalent amount or concentration of carbon dioxide.

**Decarbonisation** - The reduction of the carbon emissions from an energy system.

**Greenhouse Gases (GHGs)** - These are the seven major Greenhouse Gases. These are, with their respective Greenhouse Warming Potentials:

Carbon Dioxide (CO<sub>2</sub>) GWP 1

Methane (CH<sub>4</sub>) GWP 23

Nitrous Oxide (N<sub>2</sub>O) GWP 296

Hydrofluorocarbons (HFC) GWP 77 to 14,800

Perfluorocarbons (PFC) GWP 6,500 to 12,200

Sulphur Hexafluoride (SF<sub>6</sub>) GWP 22,200

Nitrogen Trifluoride (NF<sub>3</sub>) GWP 8,000

**Insetting** - The reduction of emissions by the implementation of measures such as re-forestation, renewable energy and restorative agriculture within an organisation's own management scope.

**Net zero** - When an organisation has achieved a position where the effects of its activities are such that they have no net increase in the carbon emissions released into the atmosphere.

**Offsetting** - The purchase of a tradeable unit, representing emissions rights or emissions reductions, to balance the climate impact of an organisation, activity or individual. Although they can be stored and traded like a commodity, they are not material objects; offset credits are not literally 'tonnes of carbon' but stand in for them and are better regarded as intangible assets or financial instruments. To act as an offset, units must be cancelled to represent a reduction and prevent further trading.

**Residual Emissions** - The estimated emissions left after the emissions reduction measures have been implemented.

**Grey Fleet** - Use of an employee's private vehicle for business use.







Loughrigg

## Executive Summary

**Climate change remains the challenge of our generation. It is one of the greatest threats to humanity globally and we have already seen and experienced the devastating impacts of it here in Westmorland and Furness with extreme weather events such as Storms Desmond (2015), Ciara (2020) and Arwen (2021).**

Despite concerted efforts from international governing bodies to slow the rate of climate change, carbon forecasts and the attitudes of such bodies towards the issue suggest that the rate of decarbonisation will not outpace that of climate change. It is increasingly apparent that we cannot simply rely on these larger institutions to invest in large scale renewable energy generation and carbon offsetting projects to slow global warming and contain the problem of climate change. We must take action locally. We must adopt a low-carbon culture and make every effort to minimise their energy usage and wastage, to ensure that any goods and services are sourced from low-carbon providers and any energy used is supplied by renewables.

Westmorland and Furness Council is a new unitary authority established on 1 April 2023 and covers the areas previously administered by the former district councils of Barrow, Eden and South Lakeland in Cumbria. It also encompasses the former functions of what was previously Cumbria County Council. The new unitary authority, like its predecessors, is committed to becoming carbon net zero and this commitment is reiterated in the Council Plan and its Climate Action Plan.

Building on the work of its predecessors, we commissioned a comprehensive Carbon Emission Baseline Study covering all of the council's assets and services, excluding pensions and investments. The study looked to measure the total greenhouse gas (GHG) emissions generated by the operations of the council and the services it delivers and provide measures to reduce these emissions.

This is aligned to the national ambition of meeting the Government's Net Zero target for the UK by 2050 and the regional ambition of making Cumbria the first net zero carbon county in the UK by 2037.



This study also outlines emissions reduction measures to achieve net zero buildings, transport and supply chain emissions, with action timelines to achieve net zero Scope 1, 2 and 3 emissions by the respective target dates. These action timelines will be further developed through individual business case development.

The three categories of GHG scope emissions are explained below:

Category	Description
Scope 1	Direct emissions from buildings, plant and vehicles owned or controlled by the council e.g. natural gas used in boilers or fuel used by company owned vehicles
Scope 2	Indirect emissions associated with purchased energy consumed by the council e.g. grid supplied electricity
Scope 3	All other indirect emissions that occur in the council's supply chain e.g. business travel, purchased goods and maintenance contracts

**Table 1: Definitions of Scope GHG emissions**

Due to the impact of COVID-19 on the council's operations and the services provided, a baseline year of April 2019 to March 2020 was chosen as the reference period as it was considered representative of the normal operations of the council and services it provides.

This baseline year is also considered to be more representative of the council's operations moving forward, as the 2020-2021 and 2021-2022 periods would likely see markedly lower emissions related to travel, due to the effects of COVID-19. The findings of the carbon emissions baseline study have been summarised in Figures 1 and 2 below.

The report sets out to summarise the greenhouse gas (GHG) emissions of the council's operations between April 2019 and March 2020 and breaks down the total into Scope 1, 2 and 3 according to the GHG Protocol Guidelines published by the UK Government. In this report the total GHG emissions are collectively referred to as tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e).

The total emissions reported during the council's baseline period is 84,551 tCO<sub>2</sub>e.

Of the total emissions calculated, 13% (11,201 tCO<sub>2</sub>e) of the baseline is attributable to Scope 1 and 2 emissions. These are largely the result of natural gas and electricity consumption in council buildings, as well as council-owned vehicle use. Decarbonisation curves to achieve net zero buildings and transport by 2037 have been developed along with programmes of activities to achieve the council's objective of net zero Scope 1 and 2 emissions by 2037.

87% of the council's total baseline are attributable to Scope 3 GHG emissions. This is significantly greater than the combined Scope 1 and Scope 2 emissions and reflects the magnitude of the services provided by the council's supply chain, many of whom are based in Cumbria. The allocation between Scope 1, 2 and 3 emissions are reflective of analysis undertaken by the Carbon Trust.

The distribution of emissions across each scope type is shown in Figure 1 and broken down further in Table 2. The three most significant sources of emissions were:

<b>1</b>	Buildings - including schools, care homes and offices
<b>2</b>	Transport - including staff travel and fuel use in fleet vehicles
<b>3</b>	Supply chain - including emissions from Capital Programme (including highways, suppliers and external care suppliers)

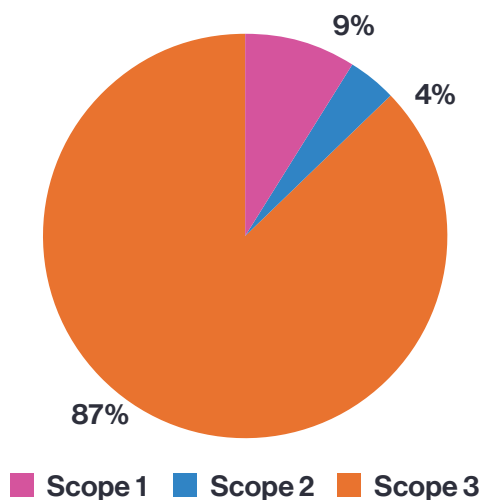


Figure 1: Scope 1, 2 and 3 overview.

GHG Scope	Tonnes CO <sub>2</sub> e	Proportion
Scope 1	7,474	9%
Scope 2	3,727	4%
Scope 3	73,350	87%
<b>Total</b>	<b>84,551</b>	<b>100%</b>

Table 2: Scope 1, 2 and 3 Breakdown

The building and transport emissions reduction workstreams are proposed to deliver significant reductions in energy consumption and the associated carbon emissions. The workstreams will, where possible, electrify sources of energy usage, providing a route to net zero by supplying this energy

demand through renewables. Where electrification is not possible (i.e. in some larger vehicles), alternative fuel technology could be utilised. Electrification of the fleet and use of alternative fuels such as HVO, will be further defined in a Fleet Management Strategy.

Implementing this strategy leaves 5,658 tCO<sub>2</sub>e of residual Scope 1 and 2 emissions associated with electricity consumption in buildings and EVs (5,275 tCO<sub>2</sub>e), gas consumption in older buildings (275 tCO<sub>2</sub>e) and HVO fuel use (108 tCO<sub>2</sub>e). Currently, the UK Government has made a commitment to completely decarbonise the national electricity grid by 2035, although in September 2023 the Government scaled back some commitments in relation to net zero, specifically with regards to the sale of petrol and diesel cars and gas boilers. If the government's commitment remains on track, the council's electricity demands can be met by green energy from the grid, eliminating the 5,275 tCO<sub>2</sub>e produced due to electricity consumption. The remaining 383 tCO<sub>2</sub>e, produced by gas boilers and HVO-fuelled vehicles, can be met by the 4MW of solar power currently under development to achieve net zero Scope 1 and 2 by 2037.

If the grid does not decarbonise by 2037, the council may have to invest in additional renewable energy generation projects and tree planting measures to eliminate the residual emissions. Considering the worst case, whereby the grid does not decarbonise at all, 10.18 MW of solar farms and 60 hectares of tree planting could be required to offset the full 5,658 tCO<sub>2</sub>e of residual emissions and achieve net zero for Scope 1 and 2 in 2037. It is recommended that the review date of this Carbon Management Strategy is a maximum of 3 years, but this may be sooner if technological advances or legislation require it. As such, a more refined position on the need for further inseting may be reviewed in 2027.

For Scope 3, supply chain management workstream, and the projected decarbonisation of the supply chain between 2024 and 2050, have been modelled.



## Introduction

Local authorities consume over 26 billion kWh of energy per year<sup>1</sup>, resulting in annual CO<sub>2</sub>e emissions of more than 6.9 Mt CO<sub>2</sub>e. As of 2019, more than half of the UK's principle local authorities have declared a climate emergency.

Energy use is a major expenditure for local authorities at a total cost of around £750 million. Local authorities are therefore well placed to influence the national goal of developing a net zero carbon economy, with the added benefit of making significant savings on expenditure and achieving long term security.



# NET ZERO

## Context

Following COP21 in Paris in 2015, the Paris Agreement, a legally binding international treaty on climate change, was adopted by 196 Parties. This was agreed with the goal to limit global warming to below 2°C, preferably to 1.5°C compared to pre-industrial levels. The initial target of below 2°C is increasingly being deemed as insufficient, with climate change institutions, such as the Science Based Targets Initiative<sup>2</sup>, no longer accepting targets that are aligned with the below 2°C scenario.

In 2018, the UN's Intergovernmental Panel on Climate Change (IPCC) issued a special report on the impacts of global warming of 1.5°C above pre-industrial levels, acting as a stimulus for local authorities to act on the 'climate emergency'. The report stated that in order to remain within a 1.5°C increase, governments must cut greenhouse gas emissions (globally) by 45% by 2030. This was followed up in 2021 with a landmark study by the IPCC in which the report was called a 'code red for humanity'<sup>2</sup>, warning that we are at imminent risk of hitting 1.5°C in the near future.

In June 2019, the UK Government amended the Climate Change Act of 2008<sup>3</sup> to commit the UK to 'net zero' for greenhouse gas emissions by 2050, reducing the UK's net emissions by 100% relative to 1990 levels. This was a significant change on the target set in the original act in 2008 that committed the UK to an 80% reduction of GHG emissions by 2050, compared to 1990.

As part of the Climate Change Act 2008, five yearly carbon budgets were fixed which set a cap on the total GHG emissions in order for the UK to meet its overall commitments. Figure 2 shows the 6th Carbon Budget (CB6) for the UK which applies to the period 2033 - 2037.

In the UK, we have seen significant and encouraging legislative and policy developments in the last few years including the Environment Act 2021<sup>4</sup>, UK Net Zero Strategy<sup>5</sup> and UK Hydrogen Strategy<sup>6</sup>, as well as ambitious carbon budgets set for the 2023-2037<sup>7</sup> period (Figure 2) and a commitment to total UK electricity grid decarbonisation by 2035<sup>8</sup>.

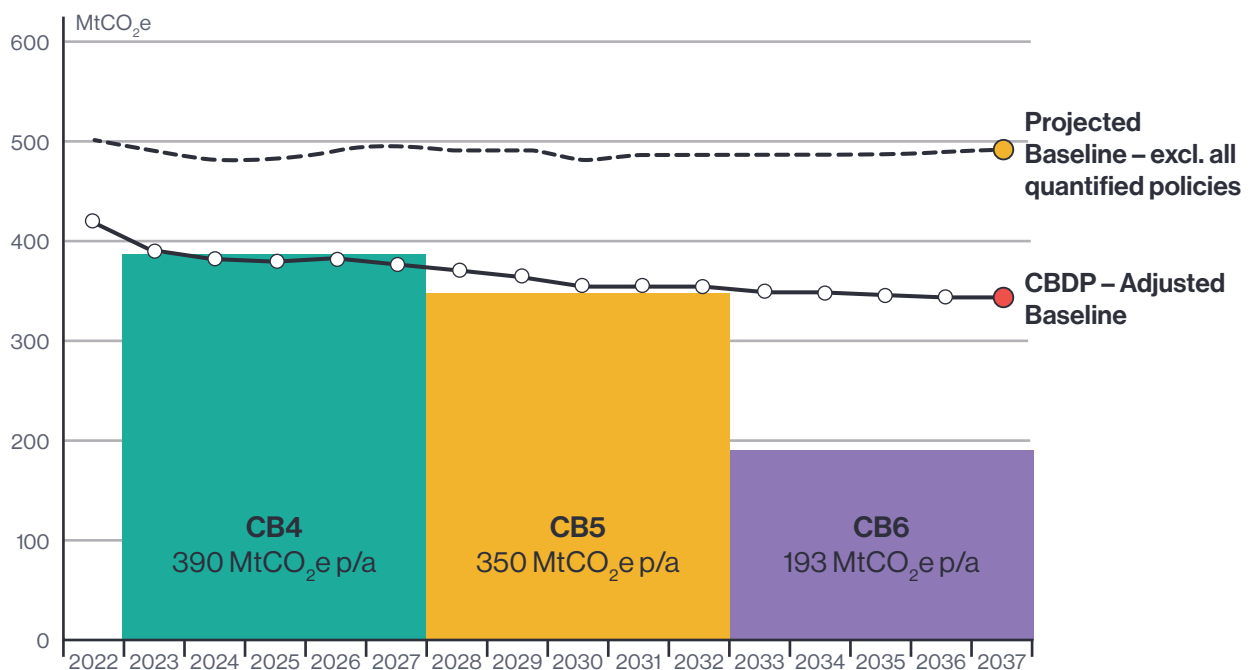


Figure 2: UK Carbon Budgets 2023 - 2037 (Carbon Budget Delivery Plan 2023)

<sup>1</sup> <https://www.apse.org.uk/sites/apse/assets/File/Mark%20Bramah%20-%20Session%203.pdf>

<sup>2</sup> <https://sciencebasedtargets.org/news/sbti-raises-the-bar-to-1-5-c>

<sup>3</sup> [https://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga\\_20080027\\_en.pdf](https://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf)

<sup>4</sup> [https://www.legislation.gov.uk/ukpga/2021/30/pdfs/ukpga\\_20210030\\_en.pdf](https://www.legislation.gov.uk/ukpga/2021/30/pdfs/ukpga_20210030_en.pdf)



## Methodology

In order to properly evaluate the route to achieving net zero emissions, we commissioned a study to assess:

- The current GHG Emissions Baseline of the council's operational service activities against which net zero should be measured.
- Appropriate emissions reduction measures for each service area in order to achieve net zero emissions.
- Techno-economic considerations associated with each emissions reduction measure identified and evaluated.
- The financial and economic benefits of achieving net zero emissions.
- Stakeholder engagement considerations required to achieve net zero emissions across the supply chain and other areas.

Walney Wind Farm

<sup>5</sup> <https://assets.publishing.service.gov.uk/media/6194dfa4d3bf7f0555071b1b/net-zero-strategy-beis.pdf>

<sup>6</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1175494/UK-Hydrogen-Strategy\\_web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175494/UK-Hydrogen-Strategy_web.pdf)

<sup>7</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1147369/carbon-budget-delivery-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147369/carbon-budget-delivery-plan.pdf)

<sup>8</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1147457/powering-up-britain-net-zero-growth-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147457/powering-up-britain-net-zero-growth-plan.pdf)



# Policy

## The Council Plan

The Council Plan was adopted in April 2023 when the new Unitary Authority was established. The plan sets out the council's vision, values and priorities for the next five years of its operations. The plan states that the council will be at the:

**'forefront of tackling climate change and the challenges it presents. We will provide leadership in the drive to become carbon net zero'.**

This study underpins one of the key priorities detailed in the Council Plan, which is:

**'Westmorland and Furness Council is working hard to ensure that the area we serve becomes carbon net zero by 2037, and our organisation, as soon as possible'.**

## Council Plan Delivery Framework

The Council Plan is now supported by the Delivery Framework which sets out the key projects the council plans to carry out during the year and what it aims to achieve. This Carbon Management Strategy will help the council deliver on aspects relating to the strategic delivery themes of **Environment, Growth and Connections**.





## Climate Action Plans Part 1 and 2

The council has taken significant steps towards becoming a net zero council with the development of Climate Action Plans Part One and Part Two. The Climate Action Plans provide the stepping stones to the council becoming carbon net zero as soon as possible and the area it serves, carbon net zero by 2037. The Carbon Management Strategy links directly to the Climate Action Plans, with its aim to decarbonise the estate and investment in renewable energy.



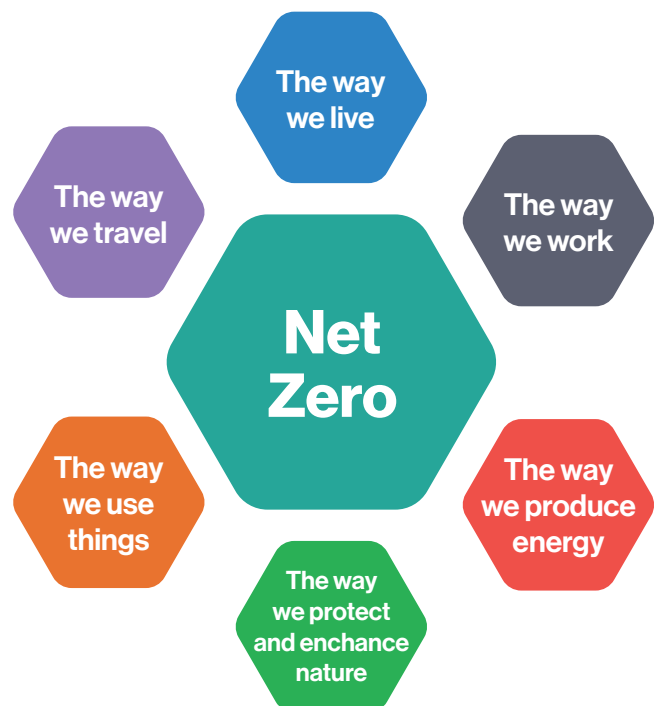
### Part One

The council agreed its Climate Action Plan Part One in July 2023. The plan:



**‘lays the foundation of the Council’s drive to respond to the climate emergency and aim to deliver net zero for Westmorland and Furness by 2037’.**

The plan focusses on six categories to tackle climate change and achieve net zero:



## Part Two

Part Two of the Action Plan has been co-designed by departments across the council, to identify suitable actions to reduce emissions, reduce environmental inequalities and create a climate positive council culture, building on the council's 'ecologically aware' value.

The Action Plan sets out the council's themes of climate action which have been designed to ensure there will be co-benefits to the council's climate action. The plan contains over 100 actions, in the form of projects, policies, initiatives and process changes the council will undertake to provide leadership in the goal for a net zero Westmorland and Furness.



**Health**



**Green Growth**



**Equality**

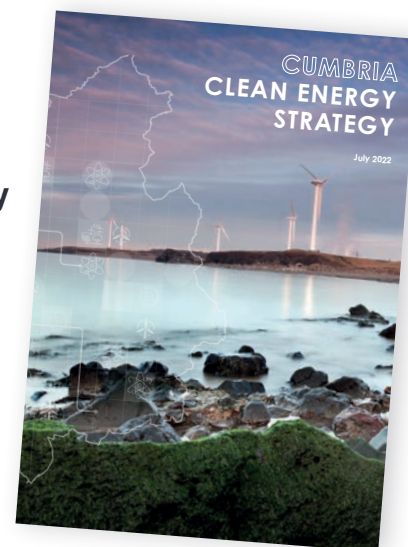


**Rurality**



## Cumbria Clean Energy Strategy (CES) 2022

Cumbria Local Enterprise Partnership (CLEP)<sup>9</sup> have identified two strategic priorities of focus as part of the overall achievement of net zero:



### Clean Energy Generation

- Offshore Wind
- Nuclear
- Hydrogen / CCUS
- Renewables

### Business Decarbonisation

- Energy efficiency/optimisation
- Switch to low carbon energy sources

The focus of the CES is on clean energy generation. This includes the decarbonisation of buildings, transport, industry and the natural environment and is being taken forward through aligned strategies, including CLEP's 10 Point Business Decarbonisation Plan. The Clean Energy Strategy provides stakeholders with a comprehensive assessment of how a wide range of clean energy opportunities could be deployed in Westmorland and Furness in alignment with government policy.

The delivery of the CES will be led by the CLEP and overseen by the Clean Energy Sector Panel, working in partnership with investors, developers and operators to drive positive economic, social and environmental outcomes.

<sup>9</sup> [https://www.thecumbrialep.co.uk/resources/uploads/pages/net\\_zero/2208-CumbriaCleanEnergyStrategy.pdf](https://www.thecumbrialep.co.uk/resources/uploads/pages/net_zero/2208-CumbriaCleanEnergyStrategy.pdf)



## Carbon Baseline Report

In April 2019, Westmorland and Furness Council's predecessors and the Lake District National Park Authority formally adopted the Cumbria Joint Public Health Strategy. Incorporated within this strategy is the following aim: 'To become a "carbon neutral" county and to mitigate the likely impact of existing climate change'.

The Cumbria Climate Change Working Group came together in 2020 to work towards this aim. This group will:

- Propose a shared definition of 'carbon neutral'.
- Propose a target date by which this is to be achieved (that is in line with a maximum warming of 1.5°C).
- Commission an independent baseline carbon audit for the County and agree ongoing monitoring mechanisms.
- Identify leadership for developing action across key topics and sectors.
- Establish a programme of action by key partners.
- Lead joint campaigning to encourage wider public awareness and action.
- Propose a target and pathway to achieve net zero carbon in Cumbria.

The 2020 Carbon Baseline study recommended the ambitious yet achievable target of 2037 to reach net zero carbon position for Cumbria. The report states that this is the most feasible target that also complies with the requirements laid down by the IPCC for "limiting warming to 1.5 degrees or below" to curb current global warming trends.

## Project Drivers

To deliver this programme to achieve net zero, we have identified a number of local drivers:

- **Improve energy security** – decreasing energy use and developing self-supply to reduce the reliance on purchasing energy from third-party sources.
- **Investing in the local economy** - investing in renewable energy not only provides business to local companies and creates new jobs but also develops new and existing local infrastructure (e.g. biomass fuel supply chains).
- **Improving quality of life for local residents** - cutting CO<sub>2</sub>e and NO<sub>x</sub> emissions will improve the air quality in the local area and reduce ailments related to poor air quality, potentially leading to reduced cost of related health care.
- **Saving money** - savings can be made to the council budget through reduced energy usage, cheaper energy supply, incentives and grants, and energy sales.
- **Lead in delivering good practice** - effective implementation of a challenging carbon management strategy will enhance organisational image and provide reputational benefits.

# Influence

According to the Climate Change Committee, local authorities have direct control over between 2-5% of their local area's emissions and have powers or influence over roughly a third of emissions in their local areas. The council has the ability to **directly control** its own emissions (i.e. Scope 1 and 2) but only has a **weak influence** over Scope 3 emissions, with the ability to encourage reductions of Scope 3. As many of these Scope 3 emissions are suppliers' Scope 1 and 2 emissions, these emissions will prove the most challenging to reduce as their sources are largely out of the council's control.

However, through strong engagement with the supply chain, developing frameworks, adjusting KPI metrics and updating procurement processes, the council can influence its suppliers to minimise emissions for which they have direct control over i.e. the supplier's own Scope 1 and 2 emissions.

Scope	Influence
1	Direct control
2	Direct control
3	Weaker influence

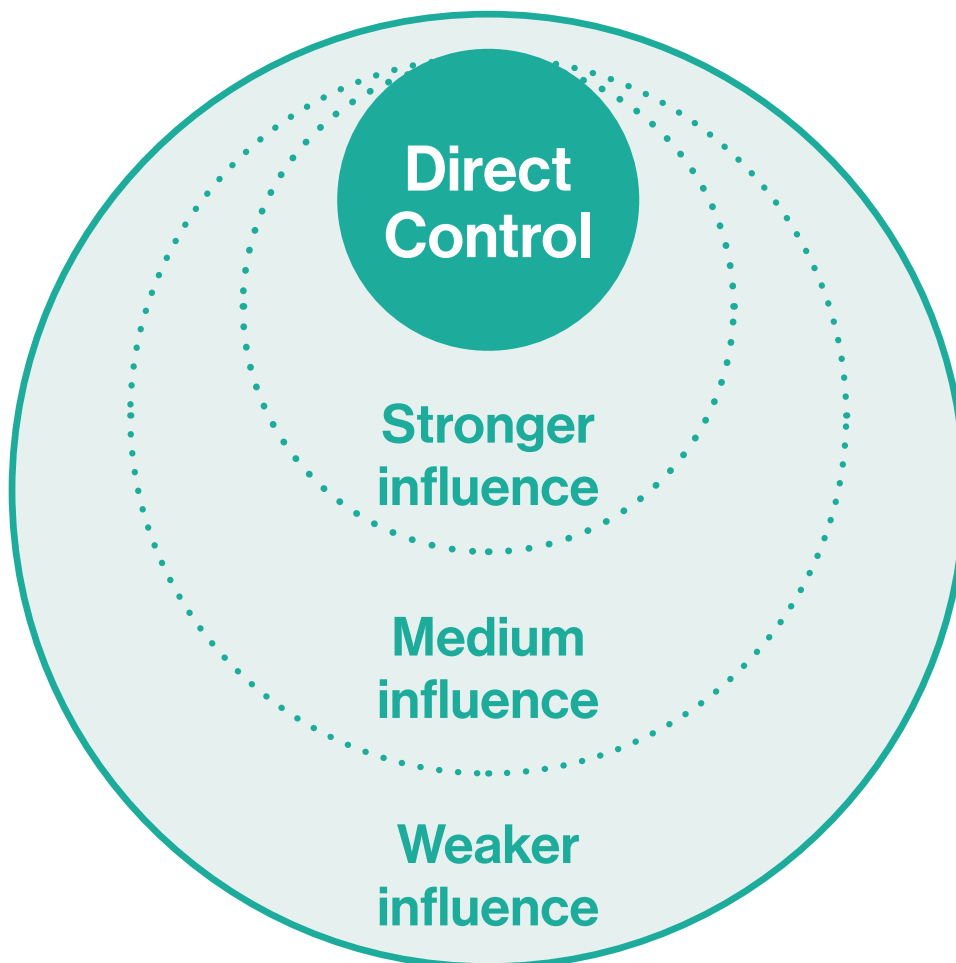


Figure 3: Spheres of Influence (Cumbria Carbon Management Strategy)

# Carbon Baseline Study

We are one of only a small number of local authorities in the country to undertake such an extensive piece of work, measuring not only Scope 1 and 2 emissions but also Scope 3 emissions for its operational services.

The boundaries and definitions for the 3 scopes are outlined by the GHG Protocol and are as follows:

Category	Description
Scope 1	Direct emissions from buildings, plant and vehicles owned or controlled by the council e.g. natural gas used in boilers or fuel used by company owned vehicles
Scope 2	Indirect emissions associated with purchased electricity consumed by the council and its districts e.g. grid supplied electricity
Scope 3	All other indirect emissions that occur in the council's supply chain e.g. business travel, purchased goods and maintenance contracts

Table 3: Definitions of Scope GHG emissions

The categorisation of our emissions into these 3 scopes illustrate the distribution of the emissions for which the council is responsible across its spheres of influence (see Figure 3). This can then inform emission reduction measures by identifying where the emissions are coming from and how much control the council has over them. This will allow the council to efficiently allocate capital to reduce these emissions.

The total emissions reported during the baseline period was 84,551 tCO<sub>2</sub>e, of which, 11,201 tCO<sub>2</sub>e (13%) are Scope 1 and 2 emissions. The remaining 87% are Scope 3 emissions, meaning the majority of the emissions are due to outsourced services that are managed and delivered by the Council. A comparison of the magnitude of emissions in each Scope is shown in Figure 5.

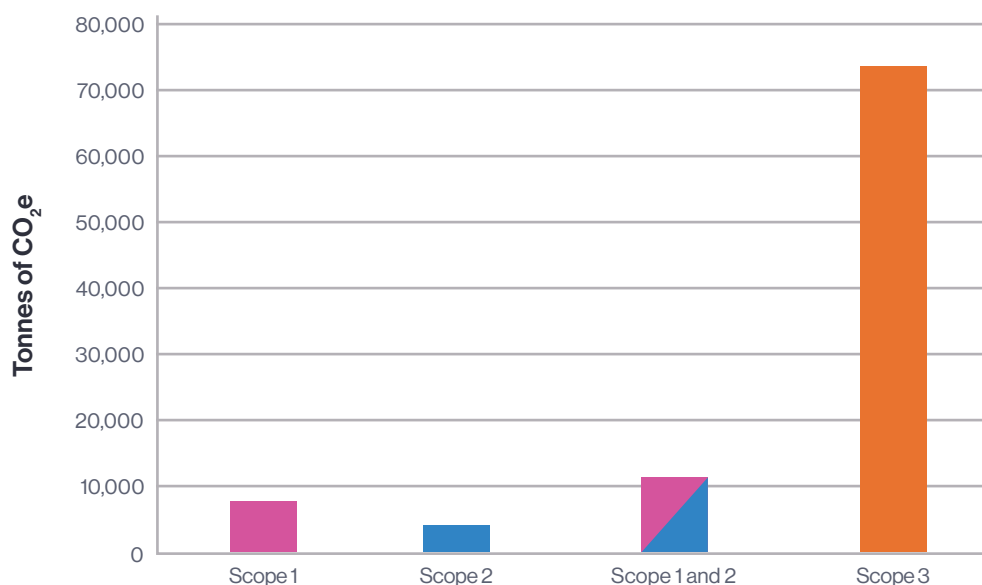
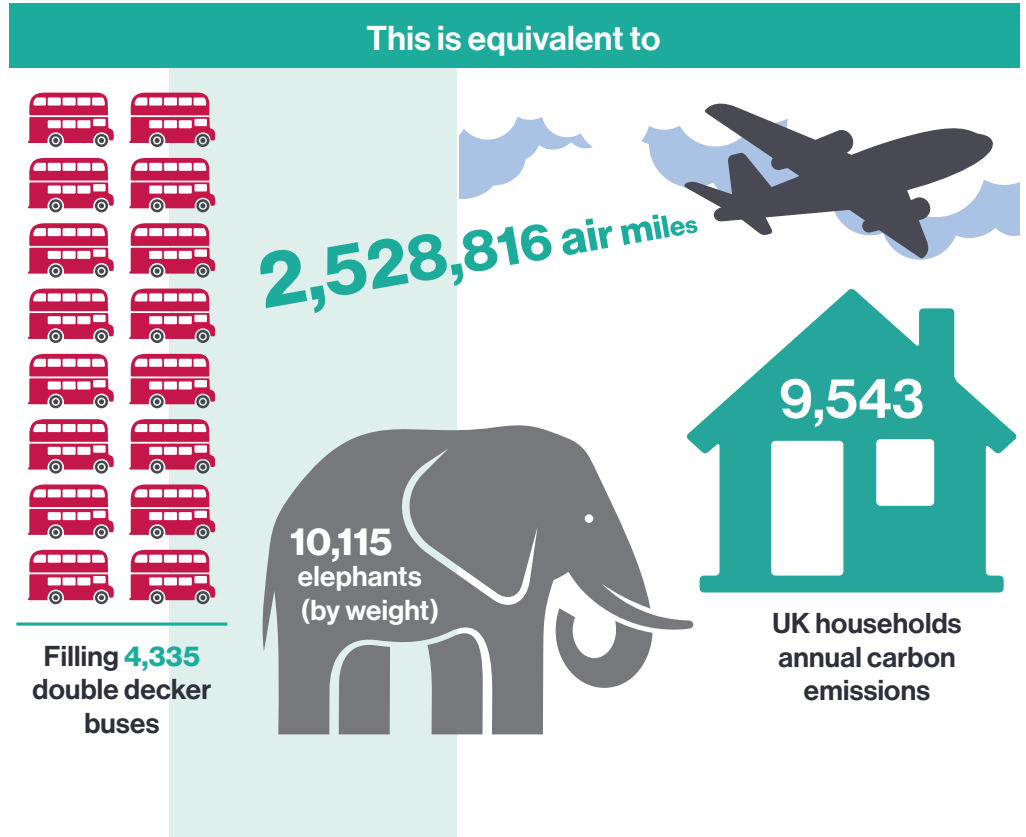


Figure 4: Scope 1, 2 and 3 Comparison



To put these emissions into perspective, the total carbon baseline is equivalent to the annual carbon emissions of 9,543 UK households or flying 2,528,816 air miles. The total weight of carbon is equivalent to 10,115 elephants or 4,335 double decker buses.



### Westmorland and Furness Council

This baseline study has been conducted using 2019/20 data from the former Cumbria County Council, Barrow, South Lakeland and Eden Districts.

Total baseline emissions are 84,551 tCO<sub>2</sub>e. Of these emissions, 9% are attributed to Scope 1 emissions, 4% to Scope 2 emissions and the remaining 87% are Scope 3 emissions. Scope 1 and 2 emissions total 11,201 tCO<sub>2</sub>e and are largely the result of building emissions and council-owned transportation. Figure 5 and Table 4 show the distribution of emissions across all 3 scopes.

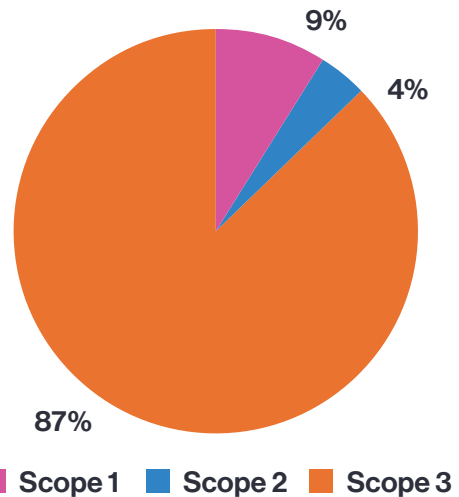


Figure 5: Westmorland and Furness Full Carbon Inventory

GHG Scope	Tonnes CO <sub>2</sub> e	Proportion
Scope 1	7,474	9%
Scope 2	3,727	4%
Scope 3	73,350	87%
<b>Total</b>	<b>84,551</b>	<b>100%</b>

Table 4: Scope 1, 2 and 3 Breakdown

## Scope 1 Emissions

Scope 1 emissions account for 9% of the total carbon inventory (Figure 6). Of these Scope 1 emissions, 59% are the result of gas use which is comprised of natural gas (97%) and gas oil use (3%) in buildings for heating. The remaining 41% are due to council-owned transportation, whereby 59% is associated with fuel card use (e.g. in pool cars), 38% with bulk fuel and 3% from other vehicle usage.

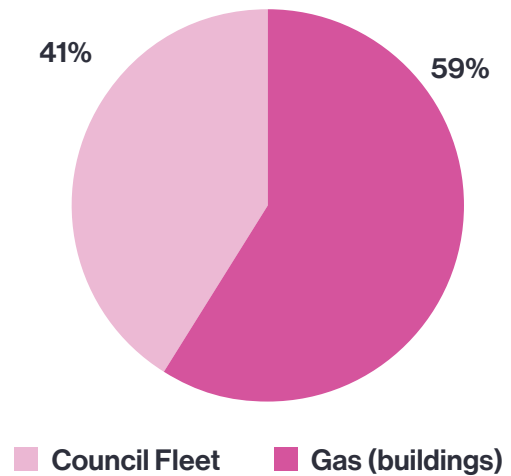


Figure 6: Scope 1 Emissions

## Scope 2 Emissions

Scope 2 emissions, account for 4% of the total carbon inventory and are solely the result of purchased electricity used in buildings and for street lighting. Of these emissions 2,279 tCO<sub>2</sub>e (61%) are produced by corporate buildings, while 444 tCO<sub>2</sub>e (12%) are produced by schools and 1,003 tCO<sub>2</sub>e (27%) are produced by street lighting (Figure 7).

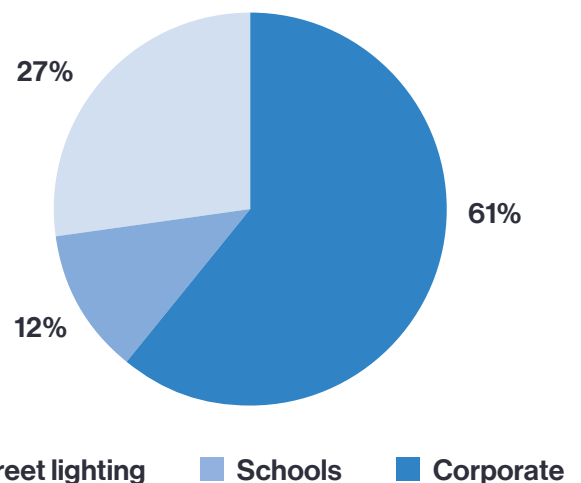


Figure 7: Scope 2 Emissions

## Scope 3 Emissions

Of the total emissions for the council, 73,350 tCO<sub>2</sub>e (87%) are classified as Scope 3 emissions (Figure 8). These are the emissions resulting from outsourced services, meaning the council has weaker control over how sustainably the goods and services are sourced. The use of transport (e.g. grey fleet, business travel, car hires) accounts for 16% of total Scope 3 emissions (10,911 tCO<sub>2</sub>e). The majority of Scope 3 emissions, 59,121 tCO<sub>2</sub>e (84%) are emissions associated with the supply chain including construction projects, care services and other purchased services.

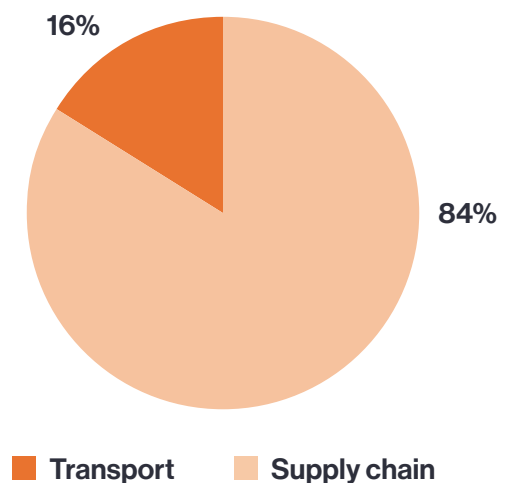


Figure 8: Scope 3 Emissions

Figure 9 depicts the sources of transport related Scope 3 emissions. This includes emissions due to business travel (rail, coach, ferry and air travel) car hire services and emissions sources that the council has a level of influence over (pool car, grey fleet and staff commute).

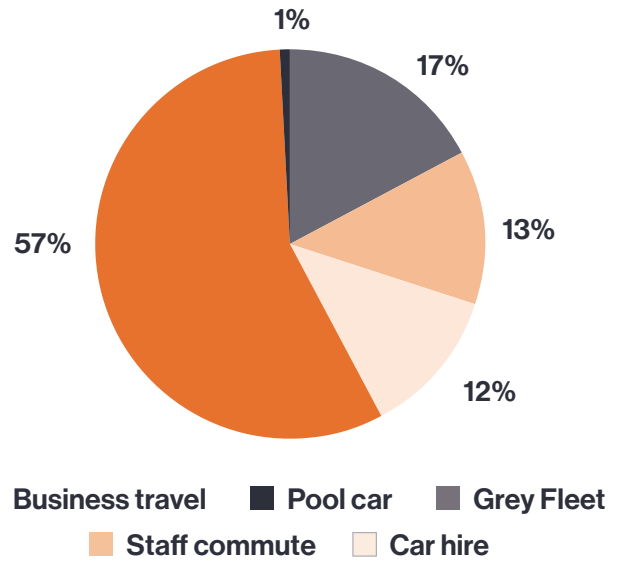


Figure 9: Scope 3 - Transport

Figure 10 depicts the supply chain emissions, which are the cause of the majority of Scope 3 emissions (84%). The bulk of the supply chain emissions are due to construction and renovation projects (46%) and the purchasing of care services (33%).

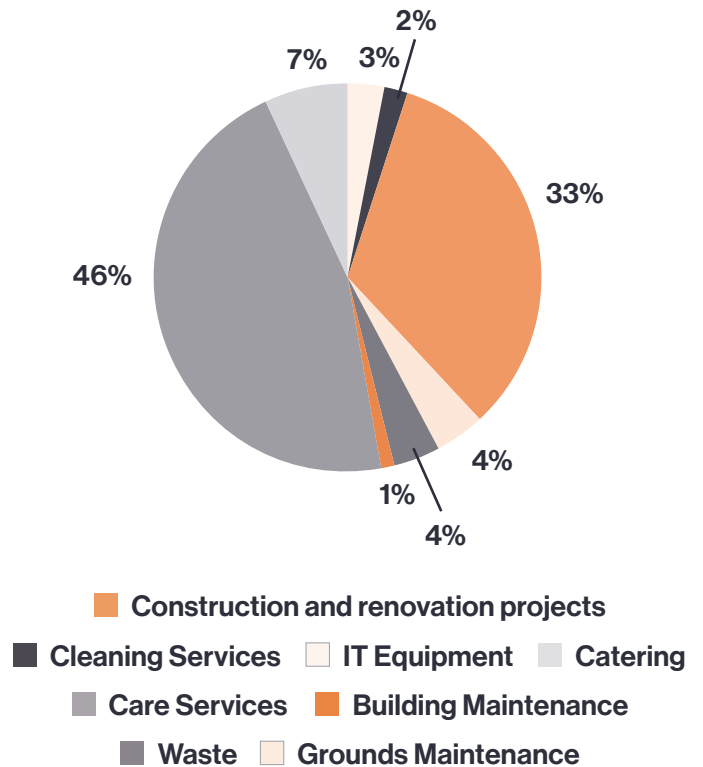


Figure 10: Scope 3 Supply Chain



Figure 11 provides a combined overview of all Scope 3 emissions. Construction and renovation projects are responsible for 42%, care services 30%, adult transport 11%, professional services 12% (cleaning, waste, catering etc.) and the remaining 5% from employee travel.

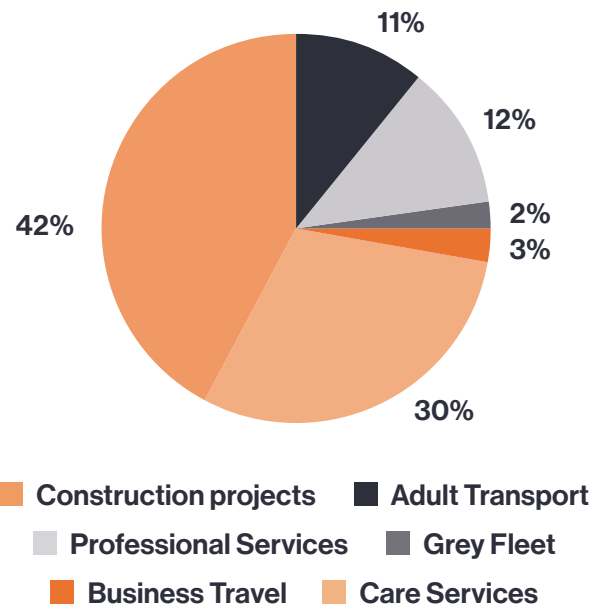


Figure 11: Total Scope 3 Emission Sources

To present a holistic overview of the council's emissions and their causes, the full carbon emissions inventory for the period 2019-2020 is depicted in Figure 12.

### Full Carbon Emissions Inventory

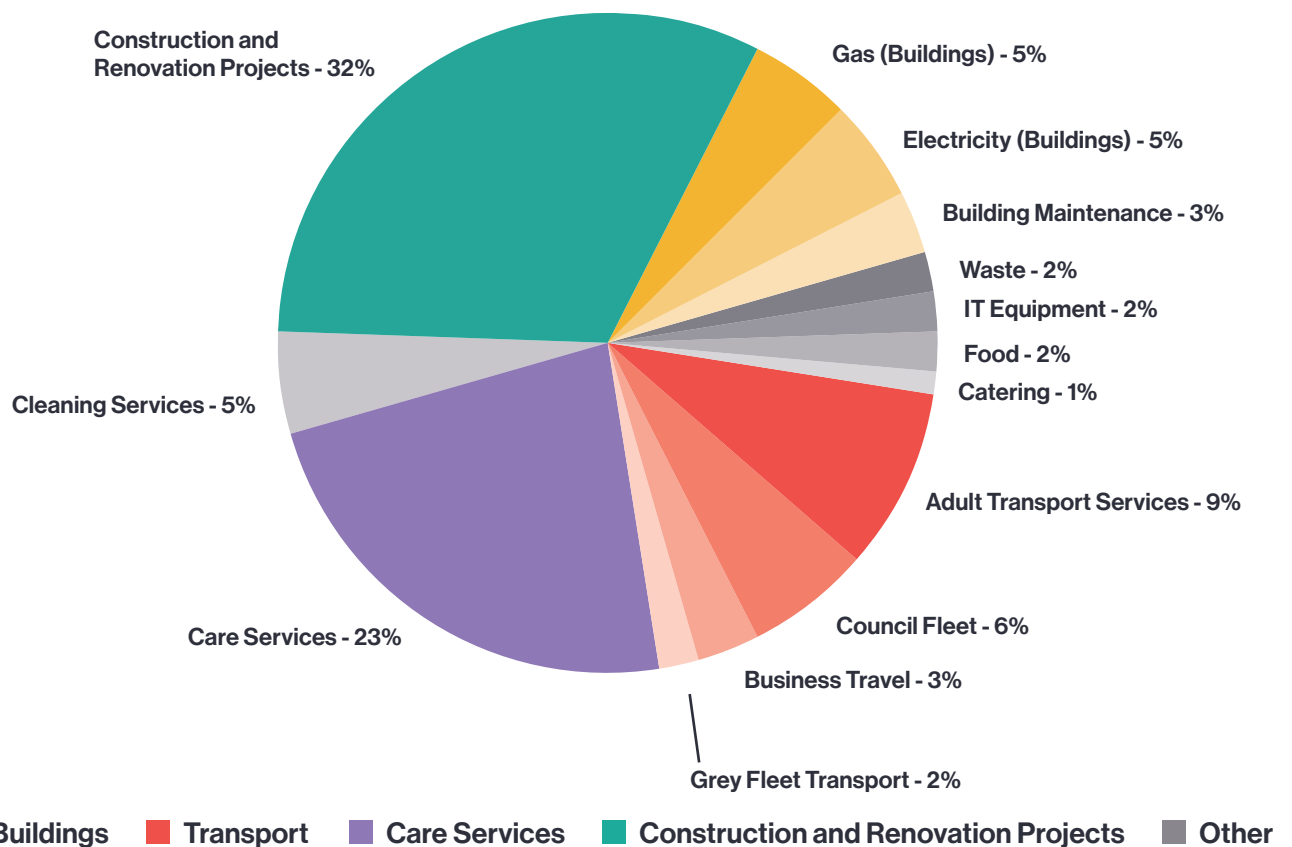


Figure 12: Westmorland and Furness Full Carbon Emissions Inventory

## Delivery Workstream

The Carbon Emission Baseline Study calculated all carbon emissions within the council's operational boundaries and identified key areas that are producing the majority of these emissions. The study was used to inform carbon reduction pathways that help the council to achieve our goal of net zero Scope 1 and 2 emissions by 2037 and net zero Scope 3 by 2050 or sooner.

The approach taken towards reducing emissions follows the principles of the energy hierarchy:

- **Prevent** – the need for energy consumption by ensuring that the wastage is avoided or reduced.
- **Reduce** – the amount of energy consumed by the upgrade of the current building systems and equipment to equivalent and more efficient systems.
- **Recover** – 'used' energy and resources and re-use where there is an opportunity.
- **Replace** – the energy consumed with renewable energy supply options.

In response to the baseline, four delivery workstreams have been developed to address the core areas of emissions:

- **Building Emissions Management** – Scope 1 and 2 emissions associated with the operation and management of the properties across the council's estate.
- **Transport Emissions Management** – Management of the Scope 1,2 and 3 emissions that are applicable to operation and management of both plant, equipment and vehicles directly owned and operated by the council and a strategy for the emissions associated with staff commuting and the use of personal cars for business trips.
- **Supply Chain Emissions Management** – These are the emissions associated with the purchases and contracts required for the operations of the council and delivery of the services expected by the local communities.
- **Residual Emissions** – After the measures identified have been implemented, there are residual emissions that cannot be mitigated by the reduction measures. These residual emissions set the magnitude of offsetting and in-setting required to achieve the net zero target.

These workstreams are underway, with work packages being developed for each workstream.

# Building Emission Reduction Methodology

The recommended building energy reduction measures were encompassed by four main categories inspired by the four principles of the energy hierarchy:

- **Behaviour Change** – ensuring council employees minimise their energy use.
- **Building Fabric** – improvements such as roof and wall insulation, window glazing and draught proofing.
- **Energy Reduction** – upgrades, utilising energy efficient technologies to reduce energy consumption.
- **Local Renewables** – the installation of solar PV on buildings with adequate roof space and conditions for solar power.

The sequence in which the energy reduction measures should be implemented has been decided based in accordance with the energy hierarchy and the time taken for it to be completed, though it should be noted that the energy reduction measures can be undertaken out of sequence, if required.

Energy awareness programmes, monitoring and targeting programmes and energy surveys have been prioritised, as these measures reduce building energy consumption by a significant margin, in a short time frame, with minimal associated costs. The awareness programmes will ensure the energy consumption of the buildings is as low as possible to avoid unnecessary investment in the more expensive and sophisticated energy reduction measures. The energy surveys are detailed feasibility studies required to finalise the technical design changes required for the implementation of energy efficient technologies such as Air Source Heat Pumps (ASHPs).

Building fabric improvements should then be undertaken, to minimise needless energy consumption and heat loss. These building fabric improvements will also be necessary to facilitate the installation of the remaining energy reduction measures, such as the electrification of heat through ASHPs, heating and fan upgrades.

Modern active energy demand reduction technologies should then be implemented. These include the replacement of all lighting with LEDs, Building Management System (BMS) optimisation using machine learning and Artificial Intelligence (AI) systems to create smart buildings, installing ASHPs for heating and hot water, AHU fan upgrades and Air Conditioning (AC) occupancy controls.

Roof mounted solar PV should then be installed wherever possible, to satisfy a sizeable portion of the electricity energy demand from green energy generated on council-owned buildings. The council will, where possible, aim to use ultra-high efficiency monocrystalline solar PV panels that provide a yield of 25% as opposed to the 15% from polycrystalline panels. These panels can be used both in the roof-mounted solar arrays and the solar farm inseting measures discussed in the 'Residual Emissions' section. With the proposed measures, solar PV would be installed across 100 buildings amounting to a generative output of 4,991,960 kWh per annum.

Table 5 provides an overview of the measures taken to reduce emissions from buildings. A description of each emissions reduction measure (ERM), as well as their scope of implementation, has been included along with approximate financial payback periods, emissions savings and cost savings.

Table 6 is a timeline for the implementation of each category of ERM, ultimately completing by 2037.



Using this approach to reducing buildings emissions, all reduction programmes are predicted to be completed by 2037. Building related emissions (including street lighting) are expected to be reduced by 78.7% from 8,161 tCO<sub>2</sub>e to 1,739 tCO<sub>2</sub>e requiring an investment of around £19 million (£1.5 million per annum), resulting in annual cost savings of around £3.5 million. These savings are calculated by applying 2023 electricity and gas prices to the consumption values before and after the ERMs are implemented. This is the total annual savings starting from 2037, when all the reduction measures have been completed. The building ERMs are expected to be completed by 2036, with BMS optimisation being an on-going process.

Figure 13 is the decarbonisation curve for the building emissions reduction measures. It shows the cumulative carbon savings of each of the measures at the completion date of 2037.

Category	Description	Payback
<b>Behaviour Change</b>	Energy Awareness Programme aiming to educate employees on how to manage their energy usage – only affects buildings with > £1,500 annual energy spend.	Short
	Monitoring and Reporting Programme – only affects buildings with > £1,500 annual energy spend.	Short
	Energy Surveys to assess which buildings are viable for electrification of heat (ASHP) – 33 buildings.	n/a
<b>Building Fabric</b>	Window upgrade, double glazing and draught proofing – in buildings with > £5,000 annual energy spend.	Long
	External door replacement – in buildings with > £5,000 annual energy spend.	Medium
	Improve loft insulation – in buildings with > £5,000 annual energy spend.	Short
	Improved cavity wall insulation and draught proofing – in buildings with > £5,000 annual energy spend.	Short
<b>Energy Reduction</b>	Replace all non-LED lighting – in 80% of buildings.	Medium
	Optimisation of existing BMS for offices using AI operated system to deliver machine learning optimisation – in top 5 buildings by energy spend.	Short
	Replace all gas-fired boilers with ASHPs – in 70% of gas consuming buildings.	Short
	AHU fan upgrade to EC units – in top 6 buildings by energy spend.	Short
	AC Occupancy Controls matching usage to occupancy – in top 8 buildings by energy spend.	Medium
<b>Renewables</b>	Local Solar PV – Solar PV installed across 100 sites, 200 m <sup>2</sup> each.	Medium

Table 5: Building Emissions Reduction Measures

### Building Emission Management Strategy Timeline

		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Building Emission Management	Behaviour Change	Energy Awareness														
		Monitoring and Targeting														
		Energy Survey														
	Building Fabric	Windows														
		Doors														
		Roof insulation														
		Wall insulation														
	Energy Reduction	LED Lighting														
		AHSP replacing boilers														
		AHU fan and control														
		AC controls														
		BMS Optimisation (Smart Buildings)														
		Local Renewables	Local PV													

Table 6: Timeline of Building Emission Reduction Measures

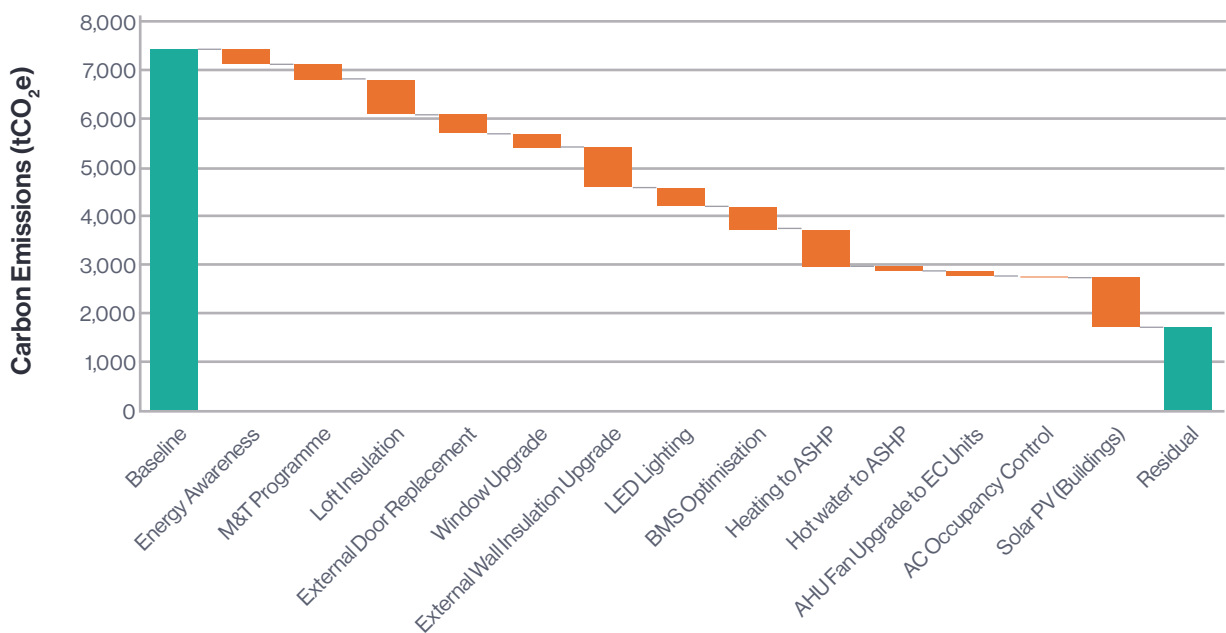


Figure 13: Buildings Decarbonisation Curve

# Transport Emissions Reduction Pathways

The UK Government predicts total grid decarbonisation by 2035<sup>10</sup>. If all council related transport decarbonisation could be carried out by electric vehicles (EVs) by that time, the council would have no emissions due to transport. However, there are a number of barriers preventing complete net zero transportation for the council. The emissions considered in the reduction pathways are those due to council-owned vehicles, grey fleet usage, staff commuting and business travel. It should be noted that all fleet related measures, will be further developed in a Fleet Management Strategy, which will further define the options available to the council and the costs associated with these.

In order to eliminate emissions relating council owned fleet, which accounts for approximately 41.5% of transport related emissions, it is recommended that these vehicles are replaced with their electric counterparts.

The transport emission reduction pathways measures were selected, categorised and implemented using the same philosophy as the building energy reduction measures.

- **Management and Process Changes** – aimed to reduce total mileage of council fleet vehicles and business travel.
- **Infrastructure Upgrades** – to facilitate the transition from using diesel and petrol to Hydrotreated Vegetable Oil (HVO) and EV's.
- **Low Emission Technologies** – involving the replacement of council owned vehicles to low emission vehicles.

The first step will be to minimise council vehicle, grey fleet, staff and business travel mileage to reduce total fuel consumption before the emissions from essential travel are mitigated through low-emission vehicles. ICT improvements to enable video conferencing and virtual meetings are recommended to reduce the need to travel between offices for business. Providing work laptops and IT peripherals to allow working-from-home is also recommended to minimise staff travel. The installation of council fleet telematics should also be implemented to monitor council fleet travel and identify carbon hot spots within the fleet where usage may be reduced.







At the time of writing, no EV counterparts for the larger, diesel council vehicles are readily available. The emissions from these vehicles can therefore be reduced by switching to HVO. This is a chemically similar, sustainably produced alternative to diesel that can be used by existing diesel engines.

The remaining smaller council fleet vehicles can be replaced with EVs to progress towards net zero transport emissions by 2035. Some EV charging points currently exist across the council's estate for public use rather than staff use. Therefore, the installation of the council's own EV infrastructure has been considered. The council owns approximately 512 vehicles with EV alternatives available as replacements. Using a 10:1 ratio of charging points to EVs, 51 charging points could be strategically installed across the council estate. It will be necessary to time the replacement of fossil fuel vehicles to EVs, alongside the installation of charging infrastructure across the council's estate.

Although immediately replacing the entire fleet would significantly reduce council fleet emissions, this would demand a large amount of CAPEX and the return on investment would initially be low but would become more appealing as 2035 approaches. As an alternative strategy, the replacement of vehicles should be prioritised as they reach end of life, with the replacement of around 10% of council vehicles with EVs each year over a 10-year period is recommended but is also subject to the development of a fleet decarbonisation strategy which may refine the approach and propose an equivalent.

Using this approach to reducing transport emissions, the completion of all reduction programmes is predicted to be complete by 2035. Transport related emissions are expected to be reduced by 64.3% from 7,313 tCO<sub>2</sub>e to 3,728 tCO<sub>2</sub>e requiring an investment of around £7.5 million (£0.580 million per annum). This results in annual cost savings of around £3.44 million.

<sup>10</sup> <https://www.gov.uk/government/news/plans-unveiled-to-decarbonise-uk-power-system-by-2035>



The residual transport related emissions are the result of HVO fuel use and business travel through non-renewable means. In the event that there is a feasible alternative for larger council vehicles by 2034, the remaining emissions resulting from business travel would be 3,620 tCO<sub>2</sub>e. To reach net zero transport emissions, all business travel must be done through green energy contracts.

Table 7 provides an overview of the ERM's taken to reduce transport emissions. A description of each measure, as well as their scope of implementation has been included, along with estimated financial payback periods, emission savings and cost savings.

Table 8 is a timeline for the implementation of the transport ERM's, ultimately completing by 2034.

Figure 14 is the decarbonisation curve for the transport ERM's. It shows the cumulative carbon savings of each of the measures at the completion date of 2037.

Category	Description	Payback
<b>Low Emissions Technologies</b>	Cycling and Walking Programme - Cycling infrastructure upgrades at council offices and depots.	Short
<b>Infrastructure</b>	HVO Vehicles Transition for all Diesel Vehicles - Prioritise >7.5 tonne vehicles use existing storage and assumed 4 additional HVO tanks.	Medium
	EV Charging points – assuming 10:1 EV to charging point ratio, install 51 new charging points.	Medium
<b>Management</b>	Telematics and Route Optimisation for all council vehicles to reduce business mileage	Short
	Eco-driving E-learning – reduce engine idling, harsh acceleration and EV familiarity	Short
	ICT Improvements – more workstations in the offices, faster internet and work phones reducing the need to travel	Medium
	Work-from-Home – provision of IT equipment, Employee laptops and monitors	Short

Table 7: Transport Emissions Reduction Measures Overview

### Transport Emission Management Strategy Timeline

		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Transport Emission Management	Management and Process Change															
		Council Fleet Telematics														
		Eco-driving E-learning														
		ICT Improvements														
		Improving Work-From-Home Capabilities														
	Infrastructure															
		Introduce EV														
		HVO Vehicles Support														
	Low Emission Technologies															
		Cycling and Walking Programme														

Table 8: Transport Emissions Reduction Measures Timeline

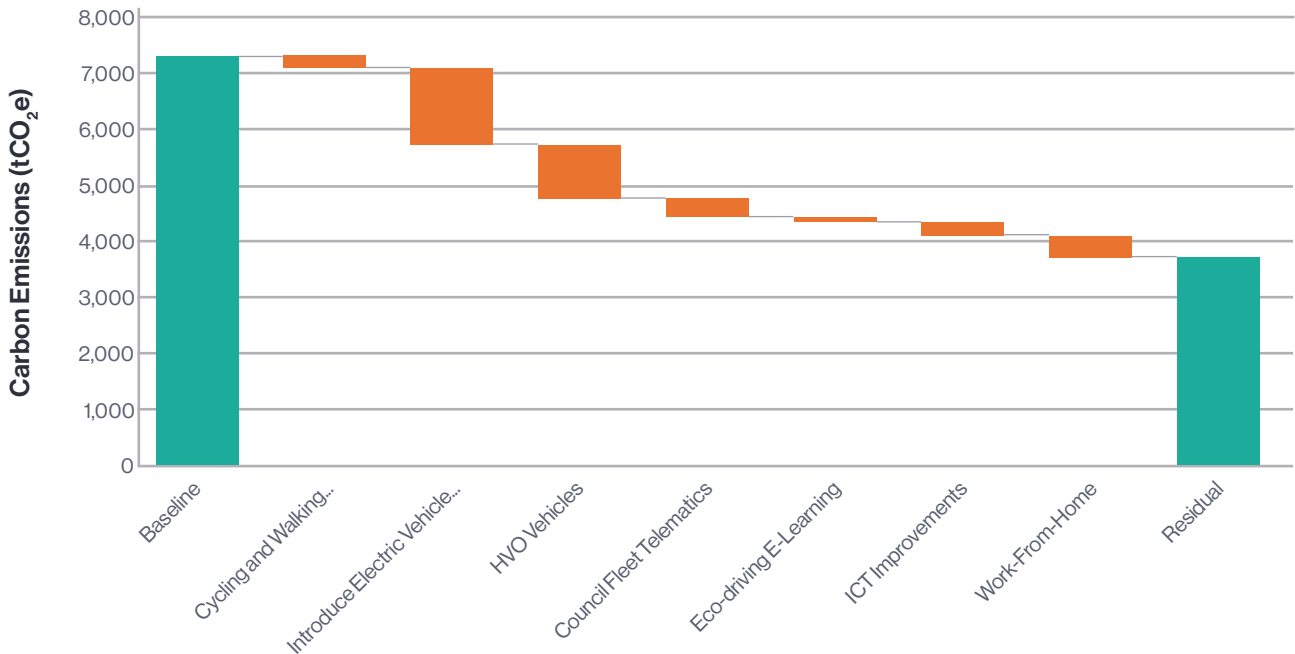


Figure 14: Transport Decarbonisation Curve



# Supply Chain Emissions Management

The main focus of this strategy is the management of carbon emissions related to the council's supply chain including purchases and contracts required for the operation and delivery of council services. Supply chain related emissions account for 59,121 tCO<sub>2</sub>e (84%) of the Scope 3 baseline and are the most challenging to mitigate.

The Scope 3 supply chain emissions have been ordered into 3 categories in relation to the council's ability to influence their impact, from Easy to Difficult and summarised below:

**EASY:** the emissions that are directly associated with the day-to-day staff activities, this includes business travel, the use of personal and non-council owned vehicles and water and sewage related emissions

**MEDIUM:** Outsourced services where the organisation is providing labour and consumable goods to manage and deliver a service on behalf of the council. This includes:

- Schools and adult service transport
- Operation of care homes, schools and day centres
- Roads and grounds maintenance
- Project delivery through the Capital Programme

**DIFFICULT:** The supply contracts associated with the provision of the school, care home and corporate food stuffs and office consumable goods.

The council will work with the supply chain to identify carbon emissions associated with the products and services that they provide and help them to implement improvements to reduce their emission. The strategy for the delivery improvements in this area is summarised below and uses the principles of reward and disincentive regarding both financial and non-financial means.



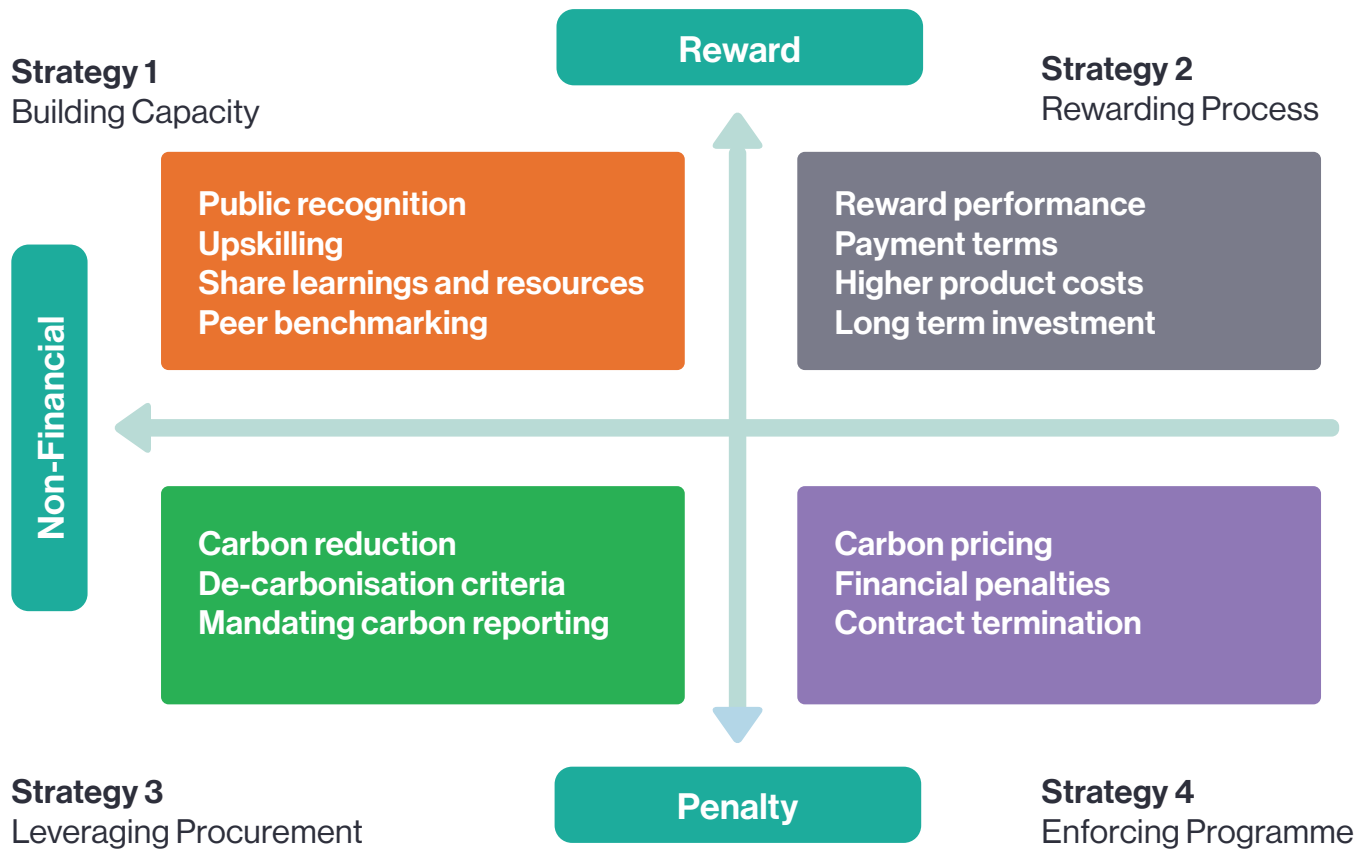
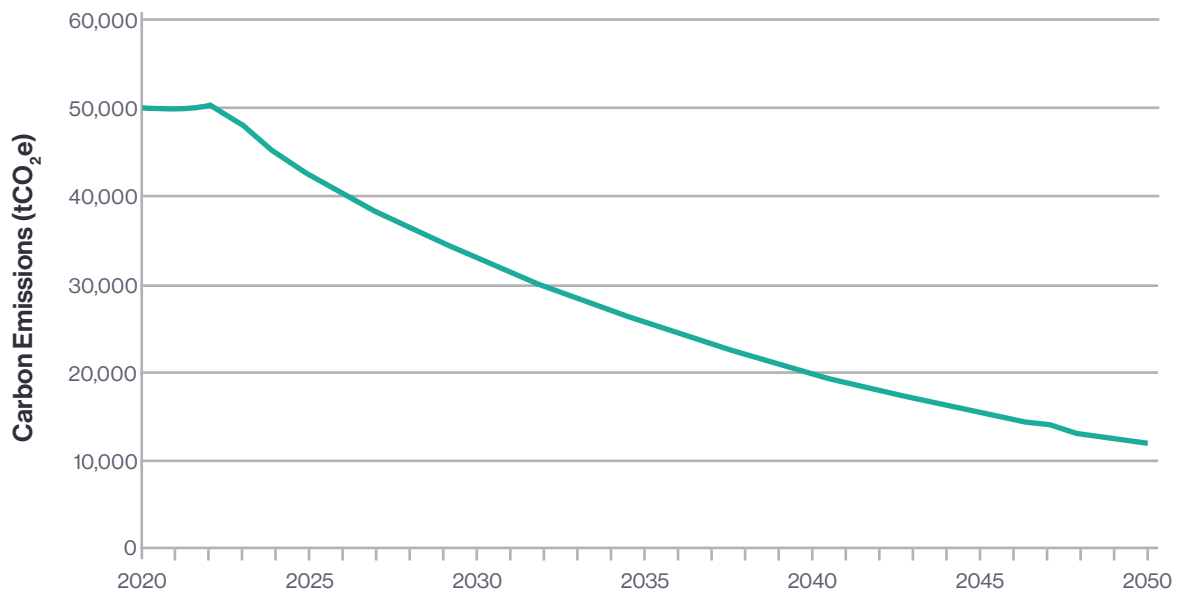


Figure 15: Supply Chain Emissions Management Strategies

With the increasing adoption of low carbon technologies and pressure on supply chain providers to reduce their carbon emissions, the council's supply chain will experience decarbonisation over time, regardless of any action taken to reduce supply chain emissions. We can forecast this passive decarbonisation by analysing the trend in carbon factors in recent years.

Carbon factors published by DEFRA<sup>11</sup> show a decreasing trend for most carbon emitting activities within supply chains. The carbon factors for a number of supply chain activities published between 2007 and 2011 have been analysed and their trajectory has been extrapolated to predict carbon factors for the period between 2024 and 2050. This analysis revealed an exponentially decaying rate of decarbonisation for the activities in the council's supply chain.



**Figure 16: Westmorland and Furness Council Supply Chain Decarbonisation Projection – ‘Do-Nothing’ Scenario**

Figure 16 shows the ‘Do-Nothing’ scenario, in which the expected supply chain related emissions up to the year 2050 are displayed, assuming the intensity of the council’s operations remain constant and that the trend in decarbonisation between 2007 and 2011 continues.

If the above forecast trajectory is realised, achieving net zero supply chain emissions by 2050 is entirely feasible. Under this ‘Do-Nothing’ scenario only 11,940 tCO<sub>2</sub>e of Scope 3 emissions need to be mitigated. This can be achieved by securing green contracts with a few key suppliers to lower these emissions further and additional investment in insetting projects to negate any residual emissions. If the council chose not to ‘green’ its supply chain and invest in insetting, to achieve net zero by 2050 would cost the council around £208,950 in carbon credits per year to eliminate the remaining 11,940 tCO<sub>2</sub>e.

The total cost in offsets has been calculated using the average price for the most well-known certification programmes for carbon credits; the gold standard and the Verified Carbon Standard<sup>12</sup>. Carbon credits with these standards are priced at around £10-25 per tCO<sub>2</sub>e, although there are many examples of cheaper and more expensive carbon credits. The average of £17.50 per carbon credit has been used to estimate the cost of offsetting residual Scope 3 emissions.

<sup>11</sup> [https://assets.publishing.service.gov.uk/media/5a7f3a06ed915d74e622928d/Table\\_13\\_Indirect\\_emissions\\_from\\_supply\\_chain\\_2007-2011.xls](https://assets.publishing.service.gov.uk/media/5a7f3a06ed915d74e622928d/Table_13_Indirect_emissions_from_supply_chain_2007-2011.xls)

<sup>12</sup> <https://www.go-positive.co.uk/page-18196#:~:text=Carbon%20Credits%3A%20%C2%A310%2D25,help%20save%20carbon%20somewhere%20else.>



## Residual Emissions

Implementing the building ERMs outlined in this report are intended to deliver significant reductions in energy consumption, which are intended to help to significantly reduce the council's carbon emissions. It is intended that the council's carbon footprint should be minimised as far as possible through the measures, however, there will still be some residual emissions as a result of energy and fuel consumption.

The proposed building and transport ERMs are intended to electrify the council's building energy demand and the majority of its fuel demands, leaving residual Scope 1 and 2 emissions of 5,658 tCO<sub>2</sub>e due to electricity usage (5,275 tCO<sub>2</sub>e from buildings, EVs and street lighting), natural gas and heating oil use in older buildings (275tCO<sub>2</sub>e) and HVO fuel consumption (108 tCO<sub>2</sub>e). The UK Government has made a commitment to completely decarbonise the national electricity grid by 2035. The council aims to achieve net zero Scope 1 and 2 emissions by 2037. This means by 2037, the council's electricity demands can be met using green energy from the national grid, eliminating 5,275 tCO<sub>2</sub>e from the residual emissions. This leaves the 383 tCO<sub>2</sub>e produced by gas in buildings and HVO fuel use that must be in-set.

Emissions insetting is the reduction of the organisation's emissions by investment in green energy projects such as the proposed large-scale solar projects in the Cumbria region. A review of the use of large-scale solar PV generation in the Cumbria region has been undertaken. There is currently 2 MW of solar PV under development in Westmorland and Furness with a further 2 MW at planning stage. This amount of PV generation should be sufficient to offset the residual 383 tCO<sub>2</sub>e.

In the event that the grid does not decarbonise by 2035, or is only partially decarbonised, the council may need to invest in more extensive carbon insetting measures to achieve net zero Scope 1 and 2 (Table 9).

The decarbonisation curves in Figures 13 and 14, show residual emissions. These are calculated using baseline consumption data and take into consideration reductions from the ERMs to be completed by 2037. These residual emissions amount to 5,658 tCO<sub>2</sub>e, a value calculated using 2023 carbon factors. This means 5,658 tCO<sub>2</sub>e is calculated as the maximum residual carbon emissions that the council may need to eliminate by 2037 in order to reach net zero Scope 1 and 2 emissions.

There are two principal methods to address this residual mass of CO<sub>2</sub>e; either through offsetting or insetting.

These projects are calculated to leave 4,932 tCO<sub>2</sub>e residual emissions. Table 9 shows the recommended insetting measures that are required to eliminate these remaining Scope 1 and 2 emissions, should the grid not be decarbonised by 2037, or be only partially decarbonised.

Insetting Measure	Avoided Emissions (tCO <sub>2</sub> e)	Estimated Cost (per tCO <sub>2</sub> e)
Solar PV – 10.18 MW	2,541	£7,620
Tree Planting – 60 hectares	2,391	£1,350

Table 9: Additional insetting measures

## Energy Reduction Measures – Abatement Costs

The UK Government has published guidance in the form of the valuation of greenhouse gas emissions: for policy appraisal and evaluation (a supplement to the Green Book), which seeks to guide decision makers on the cost of carbon emissions reduction interventions. The guidance presents a series of carbon values 'per tonne of CO<sub>2</sub> reduced' which indicates a tonne of carbon costs between £126 and £378 to remove in 2023. The figures are calculated as marginal abatement cost i.e. the marginal cost of removing one tonne of carbon from the baseline total. Whilst useful as a guide, the marginal abatement cost must be treated with caution when designing decarbonisation strategies which aim to reduce fully to net zero. Marginal abatement costs (and curves) are designed to identify measures which 'would be implemented first' usually at the margins of a strategy where a lower percentage reduction is required (i.e. 10 or 20%). The actual abatement costs for reduction measures are greater than the marginal abatement cost because the best value reduction measures (e.g. housekeeping measures), must be delivered within the strategy alongside other more expensive measures (e.g. heat pumps and renewables).

This strategy uses industry baselined costs for each energy reduction measure to inform the basic capital cost for each option. As each work package develops, the energy reduction measures (e.g. a programme of LED replacements), will also demonstrate value for money with a more detailed abatement cost appraisal including capital costs alongside savings or income to inform the final investment decisions.



## Westmorland and Furness Council – Net Zero Pathway

The waterfall diagram (Figure 17) and programme (Table 10 and Figure 18) opposite provide an overall summary of the ERMs and the magnitude of the reductions that should be needed to deliver the emissions reductions required to achieve net zero Scope 1 and 2 by 2037. The measures require a total capital expenditure of around £26 million in total or around £2. million annually. At the completion date of the ERMs (2037), the estimated cost savings are estimated to be around £8 million per annum.

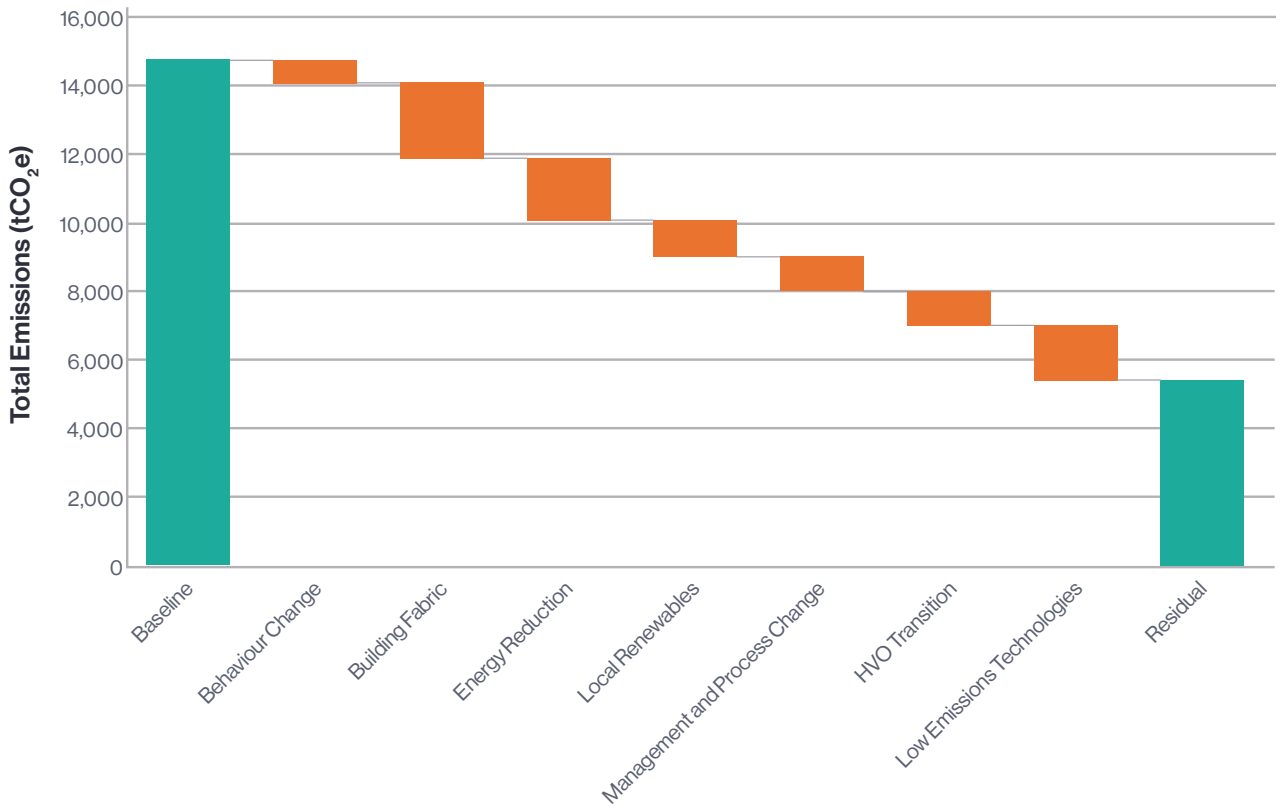


Figure 17: Westmorland and Furness Decarbonisation Curve

		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Building Emission Management	Behaviour Change														
	Building Fabric														
	Energy Reduction														
	Local Renewables														
Transport Emission Management	Management and Process Change														
	HVO Transition and Infrastructure														
	Low Emission Technologies														
Residual Emission	Large Scale Renewable Projects														
	Additional Insetting														

Table 10: Timeline of Emissions Reduction Actions

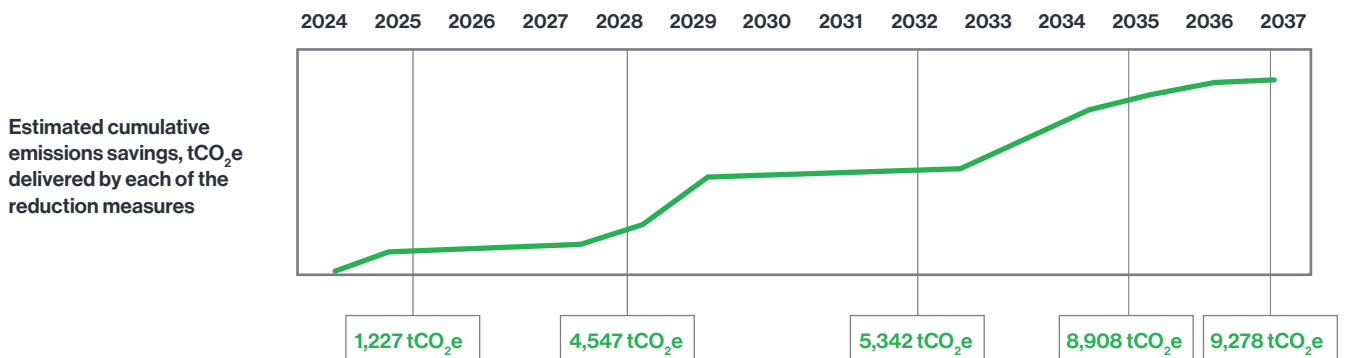


Figure 18: Emission reductions, cost savings and expected expenditure over the course of the delivery programme (2022 - 2037)



## Conclusions

The council is well placed to play a significant role in developing a position of net zero emissions and has set the target of net zero carbon emissions by 2037 for Scope 1 and 2.

A strategy to reach net zero is reflective of international, national and regional policy which set challenging targets for the delivery of net zero over the next two decades.

Based upon the 2019-20 baseline data, the council produces 84,551 tCO<sub>2</sub> annually of GHG Scope 1, 2 and 3 emissions. Of these emissions, 9% fell under Scope 1 emissions and 4% under Scope 2, meaning a total of 11,201 tCO<sub>2</sub>e Scope 1 and 2 emissions are within the council's ability to influence. The remaining 87% were Scope 3 emissions that the council has significantly less control over.

Scope 1 and 2 emissions are directly within the council's control and are typically targeted by organisations taking steps to move towards a net zero position. Scope 1 and 2 activities include building energy use and transport which are primary sources of emissions. The CO<sub>2</sub>e emissions from natural gas consumption for building heating accounts for 59.3% of the GHG Scope 1 emissions. With no renewable alternative for natural gas available, without any large-scale conversion of the building space heating and domestic hot water generation from natural gas to electric, there will be minimal reduction in these emissions in line with the council's goals. Heat loss mitigation and the electrification of heat should play a major role in minimising Scope 1 building related carbon emissions.

Scope 1 carbon emissions due to transport (41.7%) are largely the result of council vehicle usage. With the UK Government's commitment to a net zero electricity grid by 2035, the solution to dealing with

transport related emissions is to replace all current council-owned vehicles with electric vehicles (EVs). This is feasible for most of the council's vehicles, however, there are no EV alternatives for some of the larger vehicles. To minimise the emissions from these larger vehicles which are diesel fuelled, the council could switch to using HVO. HVO is a chemically similar alternative fuel source that produces 90% less carbon emissions than diesel.

These measures result in 383 tCO<sub>2</sub>e of residual Scope 1 emissions due to HVO and building heating through gas boilers. There is currently 4 MW of solar energy generation under development in the Westmorland and Furness region that can be used to offset these residual emissions. This is currently sufficient to reach complete net zero Scope 1 emissions.

Scope 2 emissions are solely the result of electricity consumption over the baseline period. By 2035, in line with the UK Government's commitment to total UK electricity grid decarbonisation, the grid will be powered by renewable energy which will mean the council should achieve zero Scope 2 emissions by their target date of 2037.

If the electricity grid does not fully decarbonise by 2037, the council will have to invest in additional inseting measures to achieve net zero Scope 1 and 2 emissions. The extent of these measures has been determined based on the maximum potential carbon emissions that the council will be responsible for once the proposed ERMs have been implemented. In this case, 10.18 MW of additional solar energy generation will be required, along with 60 hectares of tree planting to offset these residual emissions.

The remaining 87% of the carbon baseline are Scope 3 emissions which the council has little influence over. These are largely due to capital projects and the maintenance of highways and buildings (41%), care services (30%) and adult transport services (12%). A supply chain management strategy has been provided in this report but will be further developed with the procurement team.

The council's objective is to reach net zero Scope 1 and 2 emissions by 2037 and net zero Scope 3 emissions by 2050 or sooner. Buildings and transport emissions management workstreams have been designed to achieve the Scope 1 and 2 net zero target, and supply chain and residual emissions delivery workstreams have been provided to achieve net zero Scope 3.

## Building Emissions Management

Building related emissions account for 75% of the council's Scope 1 and 2 emissions. These emissions are the result of gas and electricity consumption due to heating, lighting and plant equipment usage. The steps taken to mitigate these emissions follow the four stages of the energy hierarchy:

- **Behaviour Change:** No/low-cost energy reduction measures are first put into place. These include Energy Awareness programmes, to minimise energy use by building occupants, as well as Monitoring and Reporting programmes.
- **Building Fabric:** To maximise the energy efficiency of buildings and make effective use of any energy used for heating, the building fabric of frequently used buildings is improved. This involves upgrading windows, draught proofing, improving loft and wall insulation and external door replacement.
- **Energy Reduction:** Energy efficient technologies are put in place. This includes the replacement of gas-fired boilers with ASHPs to electrify building heating, replacement of existing lighting with LED, AHU fan upgrades, BMS optimisation with AI Systems to create Smart Buildings and AC occupancy controls to match usage to building occupancy.
- **Renewables:** Once the energy consumption of buildings is reduced as much as possible, the residual energy must be supplied by renewables to achieve net zero buildings. Flat, unshaded building roof space can be used to install integrated solar PV to supply the building with this electricity.





## Transport Emissions Management

With the UK electricity grid decarbonisation expected in 2035, a simple and cost-effective route to net zero transport by 2037 is to replace council owned vehicles with EVs by this date. The introduction of EVs are currently planned be part of a long-term transport fleet and plant replacement programme, where council vehicles are replaced at end of life. It is expected that the most viable vehicles, which currently excludes the council's largest vehicles, could be replaced at a rate of approximately 10% per year, which would allow a majority of vehicles to be replaced by 2037. In the intermittent period between now and 2037, other low-carbon options are available. The fleet replacement programme will be further refined in a Fleet Management Strategy.

The majority of the council's transport emissions are the result of diesel vehicle use. These emissions can be significantly reduced by switching from diesel to HVO, an alternative fuel source that results in 90% less carbon emissions at the expense of a 10% price increase. As HVO is chemically similar to diesel, the transition to HVO also requires minimal infrastructure investment. At the time of writing, no feasible alternatives exist for some of the larger council vehicles, making HVO a key factor in minimising these emissions before alternatives enter the market.

## Supply Chain Emission Management

Supply chain emissions account for 59,121 tCO<sub>2</sub>e of the total carbon baseline and are primarily due to capital projects, highway maintenance, building maintenance projects and adult care services. As these emissions are the result of activities performed by the supply chain, the council has limited control over how the products and services are procured by the supplier and therefore little control over the associated emissions. The approach taken to reduce these emissions is to engage with the supply chain and encourage improvements in suppliers' Scope 1 and 2 emissions.

The strategies involve rewarding and disincentivising practices, through both financial and non-financial means to nurture a low-carbon culture within the supply chain. These strategies can be summarised by four sub-categories:

- **Building Capacity** – Upskilling, public recognition, sharing learnings and resources
- **Rewarding Progress** – Reward positive performance, more appealing payment terms, long term investments
- **Leveraging Procurement** – Setting decarbonisation criteria, mandating carbon reporting
- **Enforcing Performance** – Carbon pricing, financial penalties

## Residual Emissions

The ERMs outlined in this report seek to electrify as much of the energy demand as possible so that this demand can be supplied by green energy through the decarbonised electricity grid post-2035.



Limitations in the low-carbon technologies available means that there will be a small amount of carbon emissions generated that cannot be avoided by the Scope 1 and 2 target date of 2037. To achieve net zero emissions, the council can invest in projects that generate renewable energy. These projects must produce an amount of energy equivalent in carbon to the residual emissions, had they been the result of fossil fuel derived energy. The council is in the process of developing a 2 MW solar PV project in the Cumbria region with a further 2 MW at the planning stage.

This, in combination with further roof-mounted solar PV (4.992 MWh per annum), which should allow the council to achieve net zero Scope 1 and 2 emissions by 2037.

### Route to Net Zero

The delivery workstreams outlined in this report provide a path to net zero Scope 1 and 2 emissions by 2037 and net zero supply chain emissions by 2050. The timelines for the building and transport emission reduction measures are presented in Tables 11, 12 and 13.

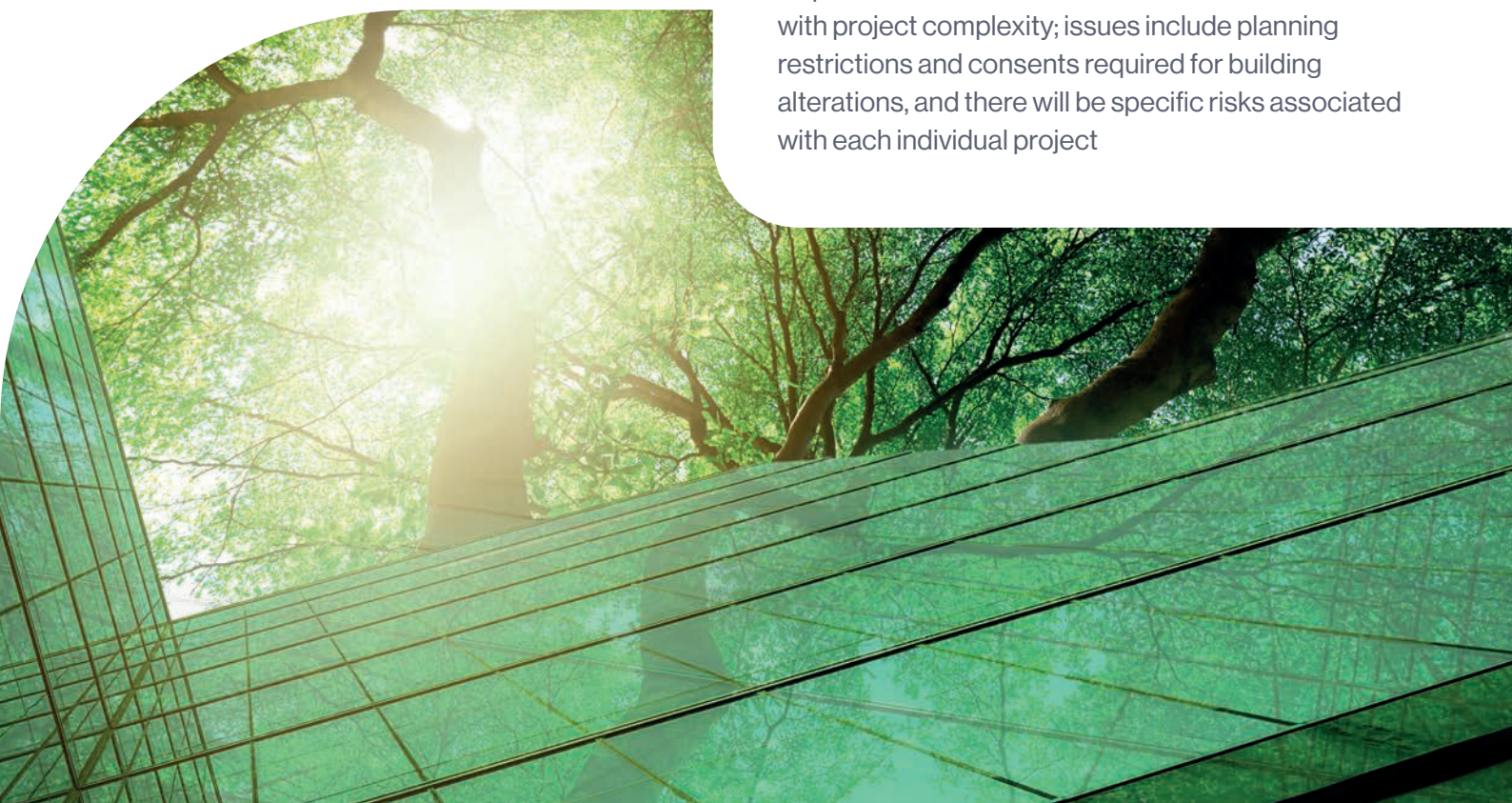
### Key risks and opportunities

'Do-Nothing' will not deliver a managed reduction in the council's emissions, however, the emission reductions that would be delivered by the decarbonisation of the UK electricity grid and engagement of the UK supply chain with the national net zero obligation, will deliver reductions in the baseline emissions.

The Buildings Emission Management strategy is supported by the projected decarbonisation of the UK national electricity grid supply. A reduction in the long-term grid emission targets will impact the amount of CO<sub>2</sub>e savings delivered by the conversion from fossil fuelled to electric heating.

Cost savings, revenue generation and economics and social value are impacted by changes in electricity and natural gas prices. An increase in natural gas price will increase potential savings and improve the economic case for fossil fuel reduction. An increase in the electricity supply price will negatively affect the economics of converting from fossil fuel to electric systems but will support the investment in renewable energy generation systems.

Capital investment will increase and decrease with project complexity; issues include planning restrictions and consents required for building alterations, and there will be specific risks associated with each individual project





## Corporate Considerations

A strategy to achieve net zero for Scope 1 and 2 emissions by 2037 and Scope 3 emissions by 2050 will deliver against a number of key corporate policies and strategies detailed below:

**The Council Plan** for Westmorland and Furness Council was adopted in April 2023 when the new Unitary Council was established. The plan sets out the council's vision, values and priorities for the next five years of its operations. The plan states that the council will be at the:

**'forefront of tackling climate change and the challenges it presents. We will provide leadership in the drive to become carbon net zero'.**

This Carbon Management Strategy underpins one of the key priorities detailed in the Council Plan, which is:

**'to ensure that the area we serve becomes carbon net zero by 2037, and our organisation, as soon as possible'.**

The Council Plan is supported by the **Delivery Framework** which sets out the key projects the council plans to carry out during the year and what it aims to achieve. The Carbon Management Strategy will help the council deliver on aspects relating the strategic delivery themes of **Environment, Growth and Connections** by underpinning and supporting the following:

- Development of a solar farm in Barrow
- Rolling out of Carbon Literacy training for all staff and elected members
- Supporting growth in the clean energy sector and helping businesses to decarbonise
- Encouragement of people to travel sustainably
- Supporting the transition to electric and other non-oil based vehicles
- Developing a plan for maintenance and improvements of roads using sustainable practices by working with the supply chain
- Supporting the roll out of electric vehicle charging infrastructure



The council agreed its **Climate Action Plan Part One** in July 2023. The plan 'lays the foundation of the council's drive to respond to the climate emergency and aim to deliver net zero for Westmorland and Furness by 2037'. The plan focusses on six categories to tackle climate change and achieve net zero:



Key items detailed in the Climate Action Plan Part One and directly relevant to the Carbon Management Strategy include:

- Building fabric improvements
- Energy reduction measures
- Renewable energy and decarbonisation
- Investment in renewable energy to help the council decarbonise its electricity supply; and
- Development of Local Cycling and Walking Infrastructure Plans.

The **Climate Action Plan Part Two** has been co-designed by departments across the council, to identify suitable actions to reduce emissions, reduce environmental inequalities and create a climate positive council culture, building on the council's 'ecologically aware' value.

The Action Plan sets out the council's themes of climate action which have been designed to ensure there will be co-benefits to the council's climate action. The plan contains over 100 actions, in the form of projects, policies, initiatives and process changes the council will undertake to provide leadership in the goal for a net zero Westmorland and Furness.

The council's adoption of Climate Action Plans Part One and Part Two demonstrates the council's commitment to becoming a net zero council and the adoption of the Carbon Management Strategy further cements this commitment. The Carbon Management Strategy is crucial to achieving the objectives set out in the Climate Action Plan. The Action Plan and Carbon Management Strategy will sit side-by-side, and through development of the actions, there is likely to be synergy which could lead to opportunities such as the development of the Barrow Solar Farm, which contributes emissions savings to both net zero targets.



			2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Building Emission Management	Behaviour Change																
		Energy Awareness															
		Monitoring and Targeting															
		Energy Survey															
	Building Fabric																
		Windows															
		Doors															
		Roof Insulation															
		Wall Insulation															
	Energy Reduction																
		LED Lighting															
		ASHP replacing boilers															
		AHU fan and control															
		AC controls															
		BMS Optimisation (Smart Buildings)															
	Local Renewables																
Local PV																	

Table 11: Building Emissions Management Timeline

			2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037		
Transport Emission Management	Management and Process Change	Council Fleet Telematics																
		Eco-driving E-Learning																
		ICT Improvements																
		Improving Work-from-Home Capabilities																
	Infrastructure	Introduce EV																
		HVO Vehicles Support																
	Low Emission Technologies																	
		Cycling and Walking Programme																

**Table 12: Transport Emissions Management Timeline**

		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Building Emission Management	Behaviour Change														
	Building Fabric														
	Energy Reduction														
	Local Renewables														
Transport Emission Management	Management and Process Change														
	HVO Transition and Infrastructure														
	Low Emission Technologies														
Residual Emission	Large Scale Renewable Projects														
	Additional Insetting														

**Table 13: Overall Reduction Measures Timeline**





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