Carbon Reduction Plan 2025

South Holland District Council

Final Draft

WSP

February 2025

Question today
Imagine tomorrow
Create for the future

10,536	78%	3,820	19	2040
tCO_2e estimated for SHDC operational GHG emission	emissions are from leased properties	of domestic properties in 2023/2024	measures to reduce carbon	Year by which net zero could be achieved

Report For

South Holland District Council

Project Team

Gareth Oakley

Milimer Morgado

Jake Trethewy

Prepared By

Milimer Morgado

Jake Trethewy

Quality Review

Gareth Oakley

Approved By

Eve Peverley

____

[Project Director’s Signature]

(Project Director)

Acknowledgements

Our thanks to South Holland District Council officers and stakeholders who participated in the development of this report, including Dean Hempsall and Sarah Baker.

WSP UK Ltd

WSP House,

70 Chancery Lane,

London WC2A 1AF

Tel +44 20 7314 5000
Web https://www.wsp.com/en-gb

Disclaimer

This report was prepared by WSP UK Limited ("**WSP**") for the benefit of South Holland District Council ("**Client**"), in accordance with the professional services agreement between WSP and the Client. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The contents of this report reflect WSP's best judgement in light of the information available to WSP at the time of preparation.

The provisions of this report to any third party are on a strictly non-reliance basis and cannot be construed as establishing a duty of care, or any form of contractual relationship, between WSP and any third party. Any third-party recipient must independently, and without reliance upon this report or upon WSP, make its own analysis and decision in relation to the subject matter of this report. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years.

Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given to by any modifications to be made to this document.

Version Control Table

Version	Date	Project ID	Reference #	Prepared by	Reviewed by	Approved by
V0 1	17/01/2025	70122051	250117_ SHDC Carbon Reduction Plan V0.1 - First Draft	Milimer Morgado Jake Trethewy	Gareth Oakley	-------------------------
V1	25/02/2025	70122051	250225_ SHDC Carbon Reduction Plan V1 - Final Draft	Milimer Morgado Jake Trethewy	Gareth Oakley	Eve Peverley

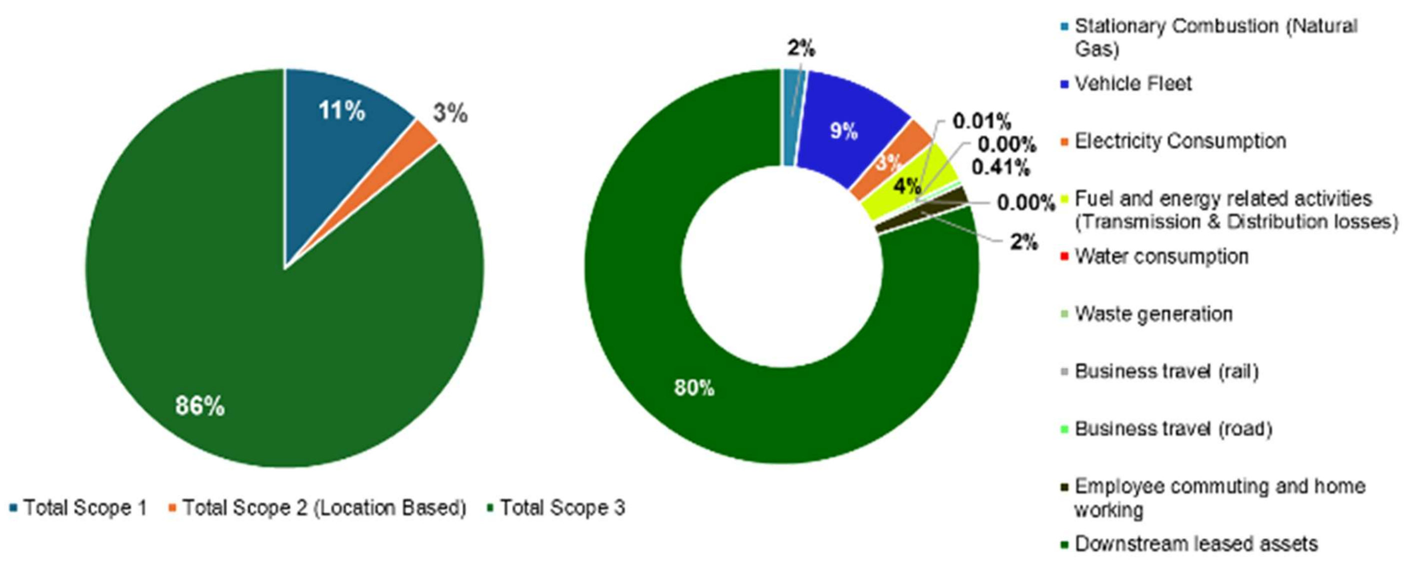
1.0 Executive Summary

SHDC Carbon Reduction Plan 2025

Executive Summary

- In 2022, South Holland District Council (SHDC), Boston Borough Council and East Lindsey District Council, through the South & East Lincolnshire Climate Change Strategy, set out a vision to achieve Net Zero emissions ahead of the UK Government's 2050 target. The strategy supports social, economic and environmental outcomes that help mitigate and adapt to climate change and build a more sustainable future for local communities.
- The establishment of the South & East Lincolnshire Councils Partnership has also given the opportunity for South Holland to complete its first Carbon Reduction Plan, aligning its processes with Boston Borough Council and East Lindsey District Council who produced their plans in 2021 and 2020 respectively.
- This Carbon Reduction Plan has been developed to consider the Council's operational greenhouse gas emissions baseline and to identify emissions hotspots and reduction opportunities through the implementation of carbon reduction measures to help achieve their Net Zero emissions aspirations.
- To develop the Carbon Reduction Plan, the first step was to produce a Carbon Baseline of SHDC operations for the financial year 2023/2024. The baseline identifies and estimates Scope 1, 2 and 3 emissions for SHDC across key services and assets.
- SHDC carbon emissions for the financial year 2023/2024 are estimated to be 10,536 tCO_2e (using the location-based approach).
- The largest source of emissions (hotspots) is domestic leased properties (SHDC's housing stock), accounting for 78% (8,204 tCO_2e) of total emissions. SHDC's vehicle fleet accounts for a further 9% (992 tCO_2e) of total emissions.

Figure 1.1 – South Holland District Council GHG Emissions by Scope and Source.



- This carbon reduction plan also outlines several identified carbon reduction opportunities across all aspects of their operations, which SHDC could look to implement over the short, medium and long term. The full list of opportunities is provided in Table 5.1 and Table 5.2 of this report.

Figure 1.2. Infographic of some of the carbon reduction opportunities for SHDC operational GHG emissions.

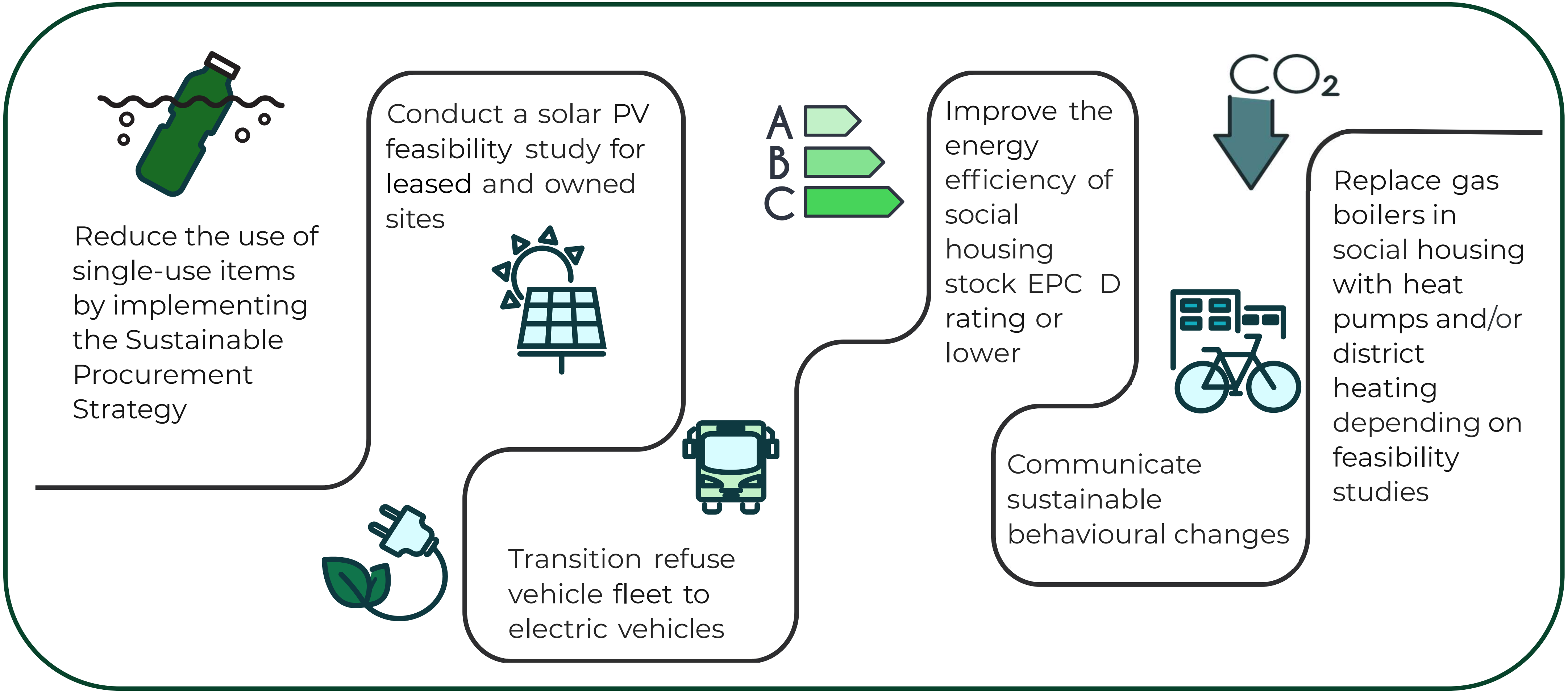


Table of Contents

List of Tables and Figures

2.0 Introduction

About South Holland District Council

Located in South East Lincolnshire, South Holland is a thriving district at the heart of the UK's agri-food sector. South Holland is known internationally for its agriculture, horticulture, food manufacturing and logistics.

The South Holland District Council (SHDC) is part of the South & East Lincolnshire Councils Partnership (SELCP) which was formed in 2021. It is the largest partnership of Councils in the country enabling greater alignment and collective working on strategic issues that are common for all the Councils. The priorities for the Partnership as identified in the Sub-regional Strategy for 2024/25 - 2028/29[1] can be summarised as:

- Growth and Prosperity – stimulating growth and enhancing the environment through attracting investment, supporting businesses and engaging with communities.
- Healthy Lives – supporting healthy lives through action to enhance the standard and availability of housing, facilitate access to leisure and cultural facilities and reduce health inequalities
- Safe and Resilient Communities – ensuring that all members of the community feel safe and welcome, and that ongoing work enhances the local environment and mitigates the impacts of a changing climate

Priorities to deliver as part of the SELCP strategy include delivering good quality core services, engaging with housing tenants to help shape service delivery and facilitating the development of infrastructure in the local area.

As part of the Partnership, SHDC works through the Climate Action Network to deliver the Climate Change Strategy, including working with partners, sharing best practice and encouraging collaboration across our communities on projects that lead to carbon reduction and adaptation to the impacts of climate change.

The Impacts of Climate Change in South Holland

The projected impact of climate change will have significant health effects, including increases in summer heat-related mortality and decreased health status of the population and additional occupational health restrictions (higher temperatures at work, more frequent and intense natural hazards preventing people from reaching their workplaces)[2] .

Spalding Academy heatwave school closure. Source: [Information about school closure on Tuesday 19th July 2022 – Spalding Academy]

According to the Met Office[3] , the warmest summer day in South Holland in the 30 years from 1991 to 2019 saw a maximum temperature of around 36.5 °C. UKCP Regional (12km) climate projections under a high emissions gas scenario (RCP8.5). estimate that if global average temperatures rise by 2 °C above pre-industrial levels, the warmest summer day could reach a maximum temperature of about 38.4 °C in

1 South & East Lincolnshire Councils Partnership Councils approve the Climate Change Strategy - South & East Lincolnshire Councils Partnership
2 WHO, Climate change
3 Climate change in your area - Met Office

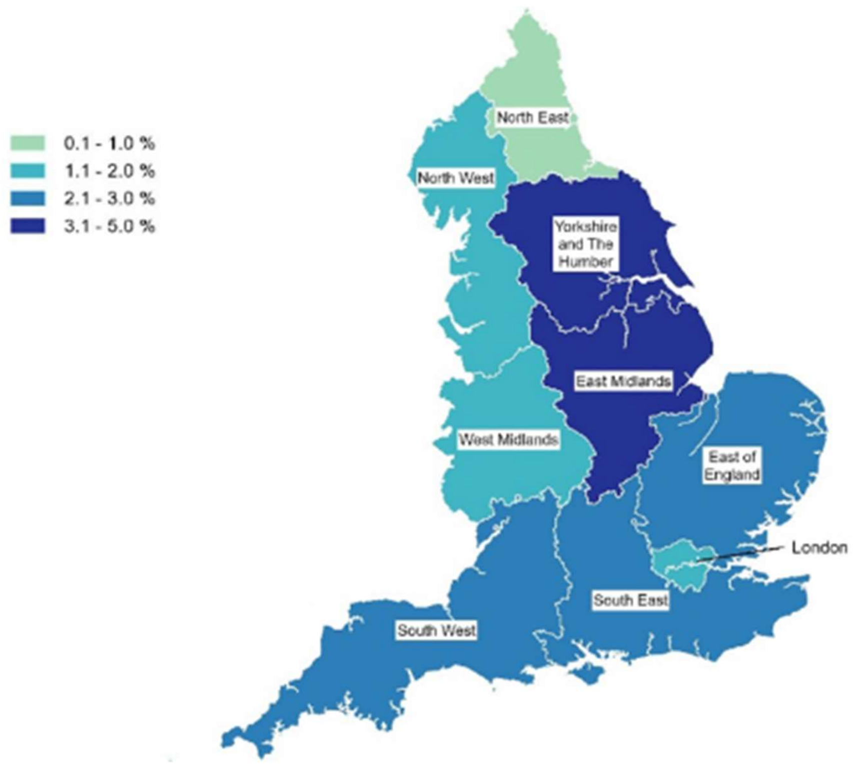
the decades ahead[4]. If global temperatures rise by 4 °C, it could be about 41.5 °C. In addition, in the 30 summers from 1991 to 2019, there were four days with a maximum temperature above 25 °C per month on average. This figure would double if global temperatures rose by 2 °C and quadruple with a rise of 4 °C.

The warmest winter day in the 30 years from 1991 to 2019 was 17.9 °C. If global average temperatures rise by 2°C above pre-industrial levels, the warmest winter day could be about 18.2 °C. If global temperatures rise by 4°C, it could reach 19.8 °C.

On the wettest summer day of the 30 years from 1991 to 2019, 55mm of rain fell in South Holland. At a 2C rise, this could be about 61mm. And at a 4C rise, it could be about 63mm, which is 15% more than now. During winter the wettest day could see an increase of 20% under 2 °C and 26% under a 4 °C temperature.

The low-lying nature of South Holland makes it vulnerable to flooding from rivers and the sea. Without sufficient action, experts warn that coastal and low-lying areas in the UK that are vulnerable to flooding could be completely submerged in water by 2050. The National Assessment of flood and coastal erosion risk in England found that 7% of properties in East Midlands areas are at high risk of flooding from rivers and sea, based on new present day risk information without considering the impacts of climate change. The Environment Agency's Flood Map estimated in 2017 that 74% of South Holland lies within a floodplain resulting in 26,503 residential and 1,296 commercial properties being at risk[5]

Figure 2.1. Properties in areas at high risk of flooding from rivers and sea, as a percentage of total number of properties per region. Source: National assessment of flood and coastal erosion risk in England 2024 - GOV.UK



[4] The modelled projections in this data do not represent a specific time period. Instead, they show what conditions could be like in these two different levels of global warming. The UKCP18 can be used to assess specific time periods.
[5] This figures have been estimated for 2017 in the South East Lincolnshire Strategic Flood Risk Assessment 2017.

These projected impacts highlight the need to reduce greenhouse gas (GHG) emissions to avoid the economic costs of extreme weather events, such as flooding and the health effects of climate change. The Environment Agency estimated the total economic damages for all floods between January 2016 and November 2019 from previous major floods in England and Wales to be £708 million (2024 prices)[6].

The UK Health Security Agency estimates that health effects of climate change in the UK[7] could be reduced if decarbonisation to limit warming is achieved and thus reduce the severity of impacts and delay them, providing valuable time for society and health systems to prepare for and adapt to health risks. For example, heat and cold-related deaths are both projected to increase in the UK, although cold impacts will dominate until late century, largely due to an ageing and growing population. Flooding and temperature rise will make the UK more suitable for the survival of vectors of public health importance.

Annual reported emissions across South Holland have been reduced to 732,603 tCO2e in 2022 - a 29% reduction in comparison to 2005 levels. However, in order to meet future reduction targets the SELCP Strategy estimates that emissions will need to be reduced by 9.5% year-on-year to remain on a 1.5°C trajectory[8].

Reducing GHG emissions from SHDC's Council operations, and settling an example to others in South Holland, will contribute to mitigating the impacts of climate change and reducing the intensity of climate risks.

[6] https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/evidence-on-the-costs-of-floods-in-england-and-wales
[7] https://assets.publishing.service.gov.uk/media/659ff6a93308d200131fbe78/HECC-report-2023-overview.pdf
[8] South & East Lincolnshire Councils Partnership Councils approve the Climate Change Strategy - South & East Lincolnshire Councils Partnership.

Context of the Carbon Reduction Plan

GLOBAL CONTEXT

Globally, thousands of scientists and government reviewers agreed that limiting global temperature rise to no more than 1.5 °C would help us avoid the worst climate impacts and maintain a liveable climate. In 2024, this global temperature threshold was surpassed; however, it is still in the best interests of the global community to limit warming as much as possible, to significantly reduce the risks, adverse impacts, and related losses and damages from climate change. Failing to do so will lead to increasingly frequent and dangerous extreme weather events including heatwaves, droughts, wildfires, and heavy precipitation and flooding. Many climate change solutions can deliver economic benefits while improving our lives and protecting the environment.

Internationally, global frameworks and agreements guide progress for governments, such as the Sustainable Development Goals[9] , the UN Framework Convention on Climate Change[10] and the Paris Agreement[11] .

What's Net Zero?

Net Zero will be achieved when greenhouse gas (GHG) emissions have been reduced to the absolute minimum levels feasible, and any remaining "residual emissions" are balanced by *an equivalent quantity of permanent removals* so that they cannot be released into the atmosphere. This includes technological solutions (direct air capture and storage) or through natural solutions (land restoration and improved forest management).
Source: Climate Explainer: Net Zero

REGIONAL CONTEXT

In the UK, tackling the climate crisis is essential to the country's national energy security, economic growth, and efforts to protect current and future generations. The UK government announced new climate goals at the COP29 UN Climate Conference in Baku, including reducing emissions by 81% by 2035. The target is in line with the recommendation of the independent Climate Change Committee (CCC), and with the UK's share of limiting global warming as much as possible.

The Climate Change Act was passed in the UK in November 2008 and in 2019 the UK extended its commitment to bring all greenhouse gas emissions to Net Zero by 2050[12] . The Act established the Climate Change Committee (CCC)[13] , an independent body to provide evidence-based advice to the UK Government and Parliament on the mandatory carbon budgets. The Committee published its advice on the Sixth Carbon Budget (2033–37) in 2020[14] – this was the first carbon budget set in line with the Net Zero target. Advice will be published on the seventh carbon budget (2038–42) in early 2025[15] .

9 Sustainable Development Goals.
10 UN Framework Convention on Climate Change.
11 Paris Agreement.
12 LSE - What is net zero?
13 https://www.theccc.org.uk/.
14 https://www.theccc.org.uk/publication/sixth-carbon-budget/.
15 LSE - What is net zero?

LOCAL CONTEXT

Local Authorities have a legal responsibility to agree plans and targets in line with the provisions of the Climate Change Act 2008. They are best placed to integrate activity on the ground and to inspire action by, local businesses, communities, and civil society[16] .

Purpose of the Carbon Reduction Plan

This Carbon Reduction Plan has been developed to help SHDC reduce its own carbon emissions and contribute to wider climate action efforts by setting a strong example to the communities it services. It identifies key emissions hotspots and priority actions the SHDC can seek to take to reduce emissions.

SHDC commissioned WSP to develop the Council's Carbon Reduction Plan. During the development process, WSP worked closely with Council officers and other key stakeholders. In November 2024, the 'SHDC Carbon Baseline Stakeholder Workshop' brought together key stakeholders in the South Holland to discuss the Carbon Baseline and work undertaken to date to engage them in discussing findings and identifying opportunities to reduce carbon emissions.

The scope of emissions that are under the direct control of the SHDC is relatively limited, but as a Local Authority, SHDC has an important role to play in driving and influencing the efforts needed to ensure a sustainable future for its communities.

The Vision

Under the Climate Change Strategy, alongside other partners, South Holland District Council, Boston Borough Council and East Lindsey District Council have committed to achieve Net Zero emissions in advance of the UK Government's 2050 target.

Scope of the Carbon Reduction Plan

This Carbon Reduction Plan is structured in the following chapters that describe the scope of the plan:

- The first chapter describes the context and background of the SHDC Carbon Reduction Plan.
- The second chapter describes the methodology and results of the Carbon Baseline of SHDC operations for the financial year 2023/2024. The baseline identifies and estimates Scope 1, 2 and 3 emissions for SHDC across key services and assets.
- A Carbon Model in excel format has been developed to complete the Carbon Baseline calculations following agreed standards in accordance with the GHG Protocol and with most relevant and up to date emissions factors to facilitate its annual updates by officers.
- The third chapter covers potential pathways to achieve Net Zero emissions based on the UK's Sixth Carbon Budget Balanced Pathway and East Lindsey and Boston Net Zero targets.

[16] LSE - What is net zero?

- Using the baseline and identified emissions hotspots, chapter four, describes the actions identified in the Carbon Reduction Plan. For example, identifying emissions and opportunities for decarbonisation in the social housing sector and Council owned buildings.
- A List of Actions in excel format has been developed to facilitate SHDC's engagement with stakeholders to prioritise actions to reduce emissions and manage the GHG management process in SHDC

.

3.0 Carbon Baseline 2023/2024

Carbon Baseline 2023/2024 Overview

This Carbon Reduction Plan contains the Greenhouse Gas (GHG) Baseline for SHDC's own operations covering the period between April 2023 and March 2024.

The most important step in the process of developing SHDC Carbon Baseline 2023/2024 was the data collection. A formal request for information was submitted to SHDC and the information received was then reviewed, which included the data sources for the reporting period (i.e., activity data, as well as necessary assumptions and emission factors to convert into carbon equivalent emissions). Through the data review, the nature and quality of the data sources were determined to identify the best methods for quantifying GHG emissions[17] associated with key sources. Using the data collected by SHDC, the Carbon Baseline 2023/2024 was developed. The following elements are described in this section:

- Organisational Boundary and Scope Setting;
- Carbon Emission Estimation Process;
- Carbon Baseline 2023/2024 Results; and
- Data Quality and Recommended Improvements.

The GHG Baseline Development Process

The GHG baseline development process consists of four key steps as outlined below:

What's A Carbon Baseline?

A **greenhouse gas (GHG) inventory often referred to as a carbon footprint** is a list of emission sources and the associated emissions quantified using standardised methods. Source: Scopes 1, 2 and 3 Emissions Inventorying and Guidance | US EPA

A **Carbon Baseline** applies the same methodology as a GHG inventory; however, the emissions estimated during the chosen period become the reference point from which emissions reductions will be compared and progress will be tracked.

1. Review accounting standards and methods, determine organisational and operational boundaries, and select a reporting period.
2. Send out a data request, collating and converting received data into an emissions total.
3. Develop a GHG Inventory Management Plan to formalise data collection procedures and presentation of results.
4. Set a GHG emission reduction target, consistently tracking and reporting progress.

This report has concentrated on steps 1- 3, SHDC will continue to engage with stakeholders to define step 4.

Organisational Boundary and Scope Setting

For the purposes of GHG accounting, SHDC's organisational boundary uses an 'operational control[18]'

[17] The terms 'GHG emissions' and 'carbon emissions' are used interchangeably in this report as GHG emissions are reported as carbon dioxide equivalent (CO2e).
[18] As defined by the Greenhouse Gas Protocol, the organisation or one of its subsidiaries has the full authority to introduce and implement its operating policies

approach as defined by the GHG Protocol Corporate Accounting and Reporting Standard[19]. Using this approach, SHDC accounts for any GHG emissions that arise from assets and activities over which SHDC has the authority to introduce and implement its own operating policies.

Carbon Baselines are broken down into Scopes, categorising activities based on the type and level of control the organisation has over them. This Carbon Baseline included emission sources from all three emission Scopes, which are defined below:

- **Scope 1** – Direct emissions arising from sources that are owned or controlled by SHDC.
- **Scope 2** – Indirect emissions arising from the consumption of electricity by SHDC.
- **Scope 3** – All other indirect emission sources that occur in SHDC's value chain, both upstream and downstream. Scope 3 is broken down into 15 unique categories by the Greenhouse Gas Protocol.

Greenhouse gas emissions are calculated and reported in tonnes of CO_2e, which accounts for the global warming potentials of several greenhouse gases and combines them into a singular unit.

Several activities fall within the boundary of each Scope. An overview of the emissions Scopes, as well as the activities which fall within them, is provided in Table 3.1.

Table 3.1 – Emission Scopes and Sources. Source: WSP adapted from GHG Protocol Corporate Standard.

Scope	Activity	Description
Scope 1	Stationary Combustion	Direct emissions arising from the combustion of fuel from stationary sources at sites owned or controlled by the reporting company.
	Vehicle Fleet	Direct emissions arising from the combustion of fuel in vehicles owned by the reporting company.
	Fugitive Sources	Direct emissions arising from the unintentional released of GHG's into the atmosphere from equipment owned or controlled by the reporting company.
Scope 2	Purchased electricity, steam, heating & cooling	Indirect emissions arising from the purchase of electricity, steam, heating and cooling from another entity.
Scope 3 (Upstream)	Purchased Goods & Services	Related to the emissions from the production of products (both goods and services) purchased by an organisation.
	Capital Goods	Related to the emissions from the production of capital goods purchased by an organisation.
	Fuel and Energy-Related Activities	Related to the production of fuels and energy purchased by an organisation that are not included in Scopes 1 or 2.
	Transport & Distribution	Related to the emissions from the transportation and distribution of purchased products between tier 1 suppliers and an organisations own operations.

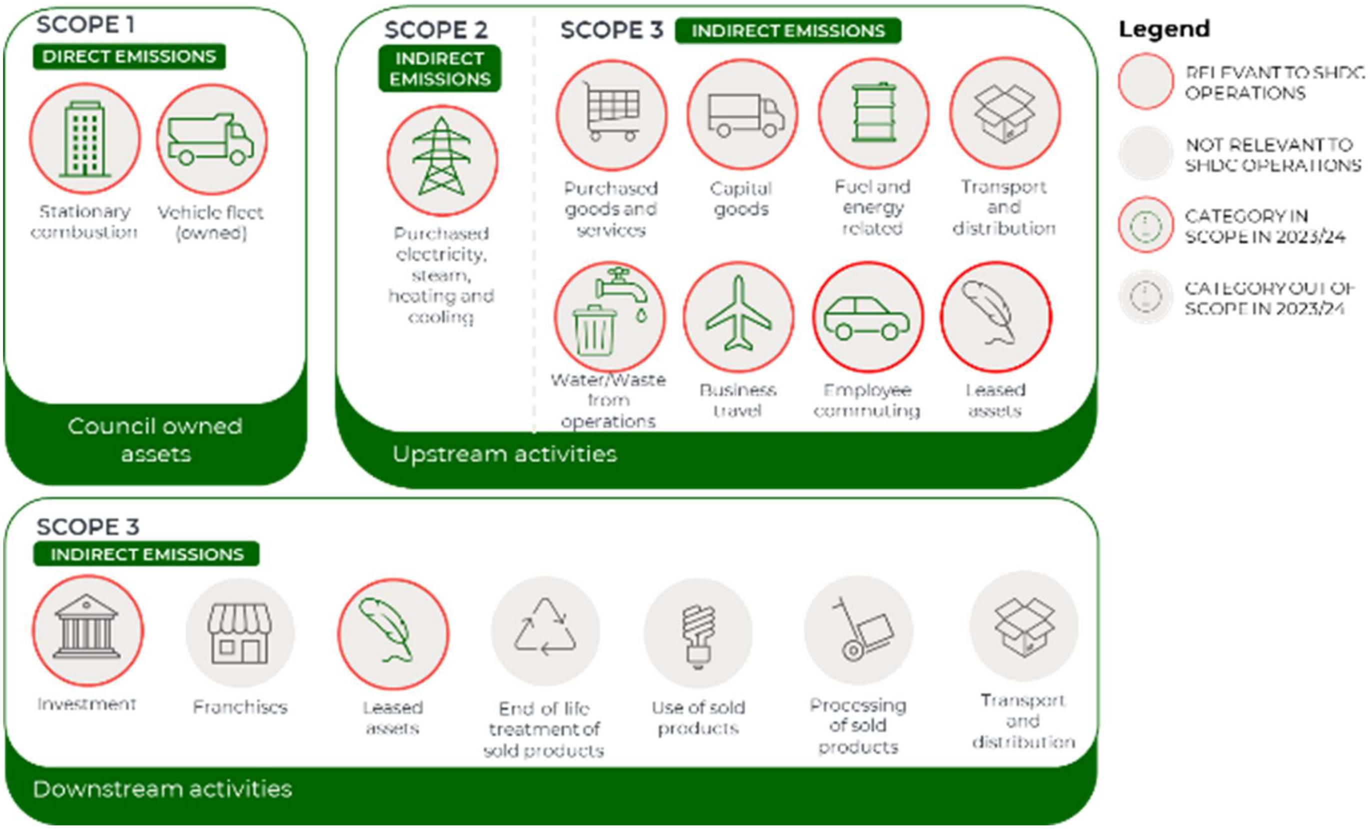
19 https://ghgprotocol.org/corporate-standard.

Scope	Activity	Description
	Water & Waste	Related to the supply and treatment of water consumed in an organisation's operations, and the disposal and treatment of waste generated by an organisation via a third-party waste contractor.
	Business Travel	Related to the transportation of employees for business-related activities in vehicles owned or operated by third parties.
	Employee Commuting	Related to the emissions from the transportation of employees between their homes and their worksites.
	Leased Assets	Related to the emissions from the operation of assets that are leased by the reporting organisation.
Scope 3 (Downstream)	Transport & Distribution	Related to the emissions that occur from the transportation and distribution of sold products
	Processing of Sold Products	Related to the emissions from the processing of sold intermediate products.
	Use of Sold Products	Related to the use of goods and services sold by an organisation.
	Sold Products End-of-life Treatment	Related to the emissions from the treatment and disposal of sold products at the end of their life.
	Leased Assets	Related to the emissions from the operation of assets owned by an organisation and leased to other entities.
	Franchises	Related to the emissions from the operation of franchises.
	Investments	Related to the emissions from the operation of investments.

Using the descriptions above as guidance, a scoping exercise determined which GHG Protocol emission categories were relevant to SHDC operations. This allowed emission categories to be scoped 'in' or 'out' depending on their material impact and the availability of data. **Figure 3.1** provides an overview of the emission sources included and excluded from this assessment.

Scope 2 emissions were calculated using both the *location-based* and *market-based* approaches. The *location-based* approach calculates emissions from electricity consumption using the average grid emission factor for the entire UK national grid. The *market-based* approach accounts for the specific electricity purchased by SHDC, as detailed in contracts or instruments like Renewable Energy Certificates. As SHDC did not procure any green energy during the reporting period, the residual market-based factor was used to calculate emissions, in accordance with the market-based hierarchy (Appendix A).

Figure 3.1 – SHDC's Carbon Inventory Emissions Boundary. Source: WSP modified from GHG Protocol Corporate Standard.



Carbon Emission Estimation Process

SHDC's greenhouse gas emissions were calculated using the best practice guidance outlined in the Greenhouse Gas Protocol[20]. For each emission source, activity data was multiplied by the emission factor specific to that activity, to generate an emissions total. Examples of activity data include vehicle mileage (miles), utility consumption (kWh), water consumption (m^3), waste quantities (tonnes) and floor area (m^2). Emission factors were obtained from the UK **Department for Energy Security and Net Zero** which are updated on an annual basis.

In instances where primary activity data was not available, appropriate benchmarks and proxies were used to estimate emissions. The assumptions made during the development of SHDC's carbon inventory, as well as any exclusions, are outlined below in **Table 3.2**. Further details of these assumption can be found in the accompanying SHDC Carbon Tool[21].

20 https://ghgprotocol.org/corporate-standard.
21 The SHDC Carbon Tool is an excel-based tool developed by WSP to facilitate the update of the Council's Carbon Baseline in the future (annually or as required by SHDC).

Table 3.2 – Assumptions and Exclusions Made During the Development of SHDC's Carbon Inventory.

Emission Source	Assumption/Exclusion
Stationary combustion	For the calculations, Billing 'invoice' start and end dates are used (as opposed to the 'read' start and end dates).
Stationary combustion	The calculations have used the 'cons kWh' column for kWh consumption. It is assumed that the conversions of m^3, ft^3 and HCF to kWh, not performed by WSP, are correct.
Fugitive emissions	Excluded from this inventory due to lack of available data.
HGVs	Issues were identified with some of the reported vehicle fleet data, where negative mileage values were recorded. These were removed from the analysis.
HGVs	'Average laden' was assumed for all HGVs.
HGVs	For vehicle number plates without an accompanying vehicle description, the DVLA database to determine the vehicle type, size and fuel. A rigid >17 HGV has been assumed for vehicles which did not have a description and did not appear on the DVLA database.
Electricity	All SHDC sites for which annual electricity consumption was a negative value (of which there were five) have been removed from this analysis, due to the unreliability of data. It should be noted that there are still anomalies with some of the sites which have a positive annual consumption value.
Water Consumption	All SHDC sites for which annual water consumption was a negative value have been removed from this analysis, due to the unreliability of data.
Waste Treatment	The disposal method of non-hazardous industrial or biodegradable waste is unknown, and was assumed to have been recovered (incinerated).
Business Travel	As no mileage data was available for taxi trips, an assumed cost of £1.24 per km was applied and used to estimated distance travelled.
Business Travel	As no mileage data was available for rail trips, an assumed cost of 17.78p per km was applied and used to estimated distance travelled.
Employee Commuting	Commuting distance for each employee was estimated using the postcodes of employees' main residence as the start point and the Council's office on Priory Rd as the end point. The mode of transport used for commuting was also assumed using National Travel Survey statistics. The miles per person per year by mode were divided by the number of working days in 2023/2024 to assign a mode of transport to the distances calculated using the provided postcodes. The modal split for travel to work for South Holland was estimated using data from the ONS.
Employee Commuting	The average emission factor for an unknown fuel average car and Class I van was used in the absence of a more detailed description of the vehicles used for commuting.
Domestic Properties - Leased Assets	In the absence of primary consumption data (kWh), to calculate emissions from the gas and electricity usage, the floor area data provided was used as a proxy. Property floor area was converted into estimated consumption using data from the National Energy Efficiency Data-Framework (NEED).
Non-Domestic Properties - Leased Assets	In the absence of primary consumption data (kWh), to calculate emissions from the gas and electricity usage, the floor area and building type data provided was used as a proxy. Building use information was allocated into building use categories provided by the NEED.

Emission Source	Assumption/Exclusion
Non-domestic Properties - Leased Assets	All vacant properties, and properties without a description were excluded from this analysis.
Non-domestic Properties - Leased Assets	In the absence of a building use description, leased properties were assumed to be office spaces.

Carbon Baseline 2023/2024 Results

South Holland District Council's total gross greenhouse gas emissions for the 2023/2024 financial year equated to 10,536 tCO_2e (location-based). When using the market-based approach, total emissions equate to 10,776 tCO_2e. A full breakdown of emissions by Scope and source can be seen in **Table 3.3**. 11% of SHDC's total emissions (using the location-based approach) arose from Scope 1, whilst 3% and 86% were from Scopes 2 and 3 respectively (**Figure 3.2**).

To create a more aligned comparison to the carbon inventories completed by Boston Borough Council (BBC) and East Lindsey District Council (ELDC), SHDC's emissions have also been calculated without the inclusion of Scope 3 Category 13 (downstream leased assets), as emissions from this category were not included in ELDC's inventory. When excluding this Category, SHDC's total emissions significantly reduced by 80%, to a value of 2,097 tCO_2e (location-based).

For reference, ELDC's 2019 emissions total was 2,583 tCO_2e, whilst BBC's 2018/19 emissions total, when also excluding Category 13 emissions, was 2,119 tCO_2e. This comparison is for illustrative purposes only, and this figure should not be used for any external reporting.

Table 3.3 – SHDC's Carbon Baseline 2023/2024 Emissions Summary.

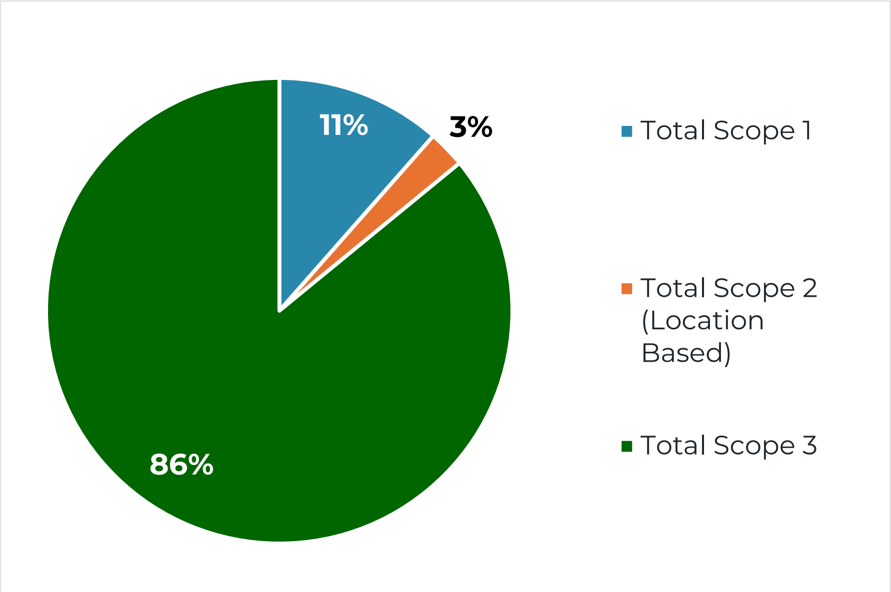
Scope	Emission Source	Total Emissions (tCO_2e)	Percentage of total (%) *
1	Natural Gas	218.3	2%
	Vehicle Fleet	992.0	9%
2	Electricity Consumption (Location-Based)	273.1	3%
Scope 1 & 2 Total		**1,483.4**	**14%**
3	Fuel & Energy-Related Activities	390.5	4%
	Water Consumption	0.3	0%
	Waste Generation	0.2	0%
	Business Travel	44.1	0%
	Employee Commuting & Home Working	178.0	2%
	Downstream Leased Assets	8,440.0	80%

Scope	Emission Source	Total Emissions (tCO_2e)	Percentage of total (%) *
Scope 3 Total		**9,053.1**	**86%**
Total Gross Emissions (Location-Based)		**10,536.5**	**100%**

**All percentages within this table have been rounded to the nearest whole number.*

The Carbon Baseline results are also illustrated graphically in Figure 3.2.

Figure 3.2 – SHDC's Carbon Baseline 2023/2024 Emissions by Scope.



SCOPE 1

The majority (992 tCO_2e, 82%) of Scope 1 emissions arose from the combustion of fuel in Council owned vehicles, whilst the remaining 18% (218 tCO_2e) were from the combustion of natural gas at facilities owned by SHDC.

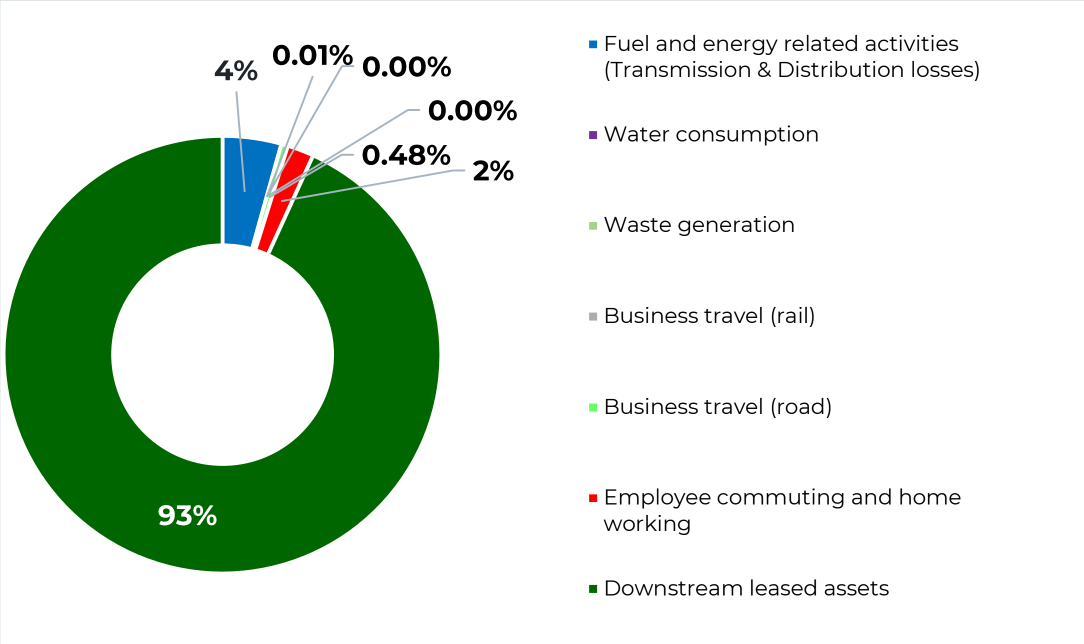
SCOPE 2

All emissions arising from Scope 2 were from the consumption of electricity at SHDC owned facilities. Total electricity consumption during the reporting period was 1.32 million kWh, which equated to 273 tCO_2e when using the location-based approach, and 512 tCO_2e when using the market-based approach. Electricity consumption was recorded through 126 unique automatic meter readers. As mentioned in **Table 3.2**, we identified five meters for which it was deemed that data was inaccurate or unreliable. Data from these meters was subsequently excluded from the analysis.

SCOPE 3

Scope 3 emissions contributed to 86% (9,053 tCO_2e) of SHDC's total greenhouse gas emissions. Within Scope 3, emissions were calculated for five categories as outlined in the Greenhouse Gas Protocol, some of which encompass multiple emission generating activities. **Figure 3.3** shows Scope 3 emissions by activity type. 93% of Scope 3 emissions are from the Downstream Leased Assets category, which includes natural gas and electricity consumption from both domestic and non-domestic properties. The majority of the emissions from this category were from domestic properties.

Figure 3.3 – SHDC's Scope 3 Emissions Breakdown.



EMISSION HOTSPOTS

The carbon inventory has been used to identified two significant emission hotspots, which SHDC can use as a focus for future emission reductions.

Hotspot 1 – Vehicle Fleet

SHDC's vehicle fleet is comprised of 44 vehicles[22], which accounted for 9% of total emissions (992 tCO_2e). Twenty five of the vehicles in SHDC's fleet are refuse collection vehicles, which accounted for 88% of total fleet emissions. During the reporting period, these vehicles travelled near 900,000 km, accounting for 72% of total distance travelled by fleet vehicles. Other types of vehicles in SHDC's fleet include trucks, vans and streetsweepers, though emissions from these vehicle types were relatively insignificant.

All of SHDC's vehicles[23] are currently powered by diesel engines, resulting in significant GHG emissions. There are several ways in which SHDC could reduce emissions from their vehicle fleet which were discussed in the SHDC Carbon Baseline Stakeholder Workshop. SHDC could, for example, transition their fleet to hybrid or electric vehicles over time. However, it is acknowledged that the rural nature of the district does present a number of challenges in this regard. The emission factor for electric vehicles is significantly lower than for diesel vehicles and will continue to decrease over time as the electricity grid decarbonises. Electric vehicles also provide other environmental benefits such as reduced air and noise pollution.

22 Based on available fleet data.
23 The 44 vehicles assessed as disclosed by SHDC.

Other potential opportunities to reduce emissions from the refuse collection service include more optimised service scheduling and driver efficiency training courses as well as exploring alternative fuels, such as trialling Hydrotreated vegetable oil (HVO), which is a low-carbon biofuel that works as a direct replacement for regular diesel.

Hotspot 2 – Leased Domestic Properties

SHDC's largest emission source was from domestic leased assets, responsible for 8,204 tCO_2e during the reporting period (78% of total emissions). SHDC leased 3,820 domestic properties in 2023/2024. The overall energy performance scores of these properties were relatively low, with 70% of the 2,604 properties with available EPC scores achieving a 'D', and only 28% a 'C' or above. However, SHDC's properties are consuming a similar quantity of gas and electricity to the national average, as outlined in **Table 3.4**, which compares the estimated energy consumption of SHDC's properties against the typical usage of a property in England, Scotland and Wales[24]. Higher EPC scores, and therefore energy efficiency, can be achieved through the implementation of energy efficiency measures.

82% of SHDC's total domestic properties were heated by gas boilers, compared to 10% by heat pumps. To reduce emissions from this source SHDC could look to encourage the installation of heat pumps at more properties. Emissions will further reduce from properties using heat pumps as the grid decarbonises further. There is also potential to expand the renewable energy capacity installed on the roofs of properties, as currently only 2% have had solar panels installed in some capacity. A feasibility study could be conducted to identify properties for which solar panels would be most effective.

Table 3.4 – Estimated Annual Gas and Electricity Consumption Comparison between SHDC and England, Scotland and Wales.

Energy Source	SHDC	England, Scotland & Wales Average*
Gas (kWh)	8,510	11,500
Electricity (kWh)	2,854	2,700

*Estimated energy usage for a typical household.

Data Quality and Recommendations for Improvement

As part of the Carbon Baseline assessment, the quality of activity data received was assessed and scored. This assessment was based on the five accounting principles outlined in the Greenhouse Gas Protocol: relevance, completeness, consistency, transparency and accuracy. Data quality scores were ranked on a scale of 1 to 5. A description of each score is outlined below.

- **Score 1** – Primary data which is accurate and granular, and hard to improve upon.
- **Scores 2 & 3** – A mixture of primary and secondary data sources which provides less accurate emissions outputs, but the underlying activity data still carries a high degree of confidence.

24 Average gas and electricity usage | Ofgem.

- **Scores 4 & 5** – Predominantly tertiary data which is highly assumptive or includes a significant number of estimates.

Table 3.5 below provides a summary of the data quality assessment. Overall data quality is low, with the most common scores being 3 and 4. Domestic properties, SHDC's largest emission source, received a score of 4. Improving the quality of activity data provided would significantly improve the accuracy of the calculations in future years and should therefore be a priority for SHDC.

Table 3.5 – Data Quality Assessment Results.

Emission Source	Data Quality Score	Score Justification
Natural Gas	4	Activity data was provided in the form of invoices, which showed the invoice period, as well as consumption. However, a significant proportion of readings provided were estimates.
Vehicle Fleet	3	Calculations have been performed using the distance-based method, which provides less accurate emissions outputs than the fuel-based method. However, there is a high degree of confidence in the accuracy of the activity data. Several line items had to be removed as they were not filled out correctly. This was mainly due to either no 'end mileage' or vehicle number plate being recorded.
Electricity	3	The activity data was recorded using non-half hourly meters. However, some consumption values appeared to be incorrect due to the significant variation in consumption between months. Also, for some line items, no location was provided.
Fuel & Energy-Related Activities	3	The accuracy of emissions from this category is directly related to the accuracy of activity data for Scopes 1 and 2.
Water Consumption	2	Primary activity data was provided in the form of invoices, which showed the invoice period, water supply and treatment values and the location. There were multiple line items with negative consumption values recorded, however these had no material impact on the results.
Waste Generation	1	Primary activity data was provided by the waste contractor. Waste quantities and types were provided, allowing for accurate emissions calculations to be performed.
Business Travel (Rail & Taxi)	5	In the absence of primary or secondary data, to calculate emissions from rail travel the total cost spent on rail journeys was calculated and divided by a cost per km value taken from an online source. The same approach was used to calculate emissions from taxis.
Business Travel (Road)	3	To calculate emissions from car journeys the distance-based approach was used. For the majority of car journeys, mileage was recorded. Journeys with no recorded mileage data were excluded.
Commuting & Homeworking	4	To calculate emissions, WSP estimated commuting distances using the distance to SHDC's main offices from employees' residence using postcodes provided by SHDC. Transport mode was assumed using the average distance per transport mode for daily commutes in England and South Holland. Home working patterns were assumed to be 1 day per week from the office and 4 from home for FTEs. Data quality is deemed low due to the significant assumptions made in the absence of primary data.

Emission Source	Data Quality Score	Score Justification
Domestic Properties	4	In the absence of primary consumption data, floor area was used as a proxy for both gas and electricity.
Non-Domestic Properties	4	In the absence of primary consumption data, floor area was used as a proxy for gas and electricity consumption. Each building was assigned a use type based on the description provided by SHDC, and the corresponding energy intensity value was applied.

For each emission source included in the inventory, recommendations for future improvements in the quality of activity data provided (Error! Not a valid bookmark self-reference.) have been made, which if implemented would result in a more accurate emissions total. Nonetheless, at this was the first Carbon Baseline, the best possible data was used.

Table 3.6 – Data Quality Improvement Recommendations.

Emission Source	Recommendations for Improvement
Natural Gas	Install automatic meter to accurately monitor gas consumption on a regular basis, reducing the reliance on estimates.
Vehicle Fleet	Obtain and record fuel consumption data for all fleet vehicles, which would allow for the more accurate fuel-based calculation method to be used. Ensure that all line items are filled out completely and correctly.
Electricity	Obtain accurate monthly meter readings data, either through physical readings or by installing automatic meter readers (AMRs).
Fuel & Energy-Related Activities	There are no specific recommendations for improvement for this emission source as its accuracy is dependent on the quality of activity data for other emission sources.
Water Consumption	Obtain accurate monthly meter readings data, either through physical readings or by installing automatic meter readers (AMRs).
Waste Generation	Obtain information on the method of waste treatment for all waste streams from contractors to eliminate the need for minor assumptions made.
Business Travel	Record the to and from locations for all journeys undertaken. For journeys undertaken via road in employee-owned vehicles, fuel card data could be recorded for more accurate emission calculations.
Commuting & Homeworking	Conduct an employee commuting survey to obtain primary data, thereby eliminating the requirement for significant assumptions to be made.
Domestic Properties	Obtain Energy Performance Certificate of properties (EPCs) to estimate consumption of natural gas and electricity to replace current assumptions.
Non-Domestic Properties	Obtain Energy Performance Certificate of properties (EPCs) to estimate consumption of natural gas and electricity to replace current assumptions.

4.0 Pathway to Net Zero

Pathway to Net Zero Overview

East Lindsey District Council (ELDC) and Boston Borough Council (BBC) have adopted Net Zero commitments in advance of the UK Government. Both have set a target to reduce emissions from their own operations by 45% by 2027 and to Net Zero by 2040. Both Councils have developed Action Plans identifying projects and initiatives required to deliver the reductions needed are being implemented to ensure progress remains on track.

South Holland District Council has not formally adopted a Net Zero emissions target. However, as a member of the SELCP it is committed to look at the wider issues and opportunities that Climate Change presents for local communities (and therefore territorial GHG emissions within South Holland).

In the South and East Lincolnshire Climate Change Strategy, a carbon budget for territorial emissions is calculated for each Council. For SHDC territorial emissions, this means a 9.5% year on year reduction from 2020.

In the UK, the CCC has modelled the Sixth Carbon Budget, required under the Climate Change Act, which provides ministers with advice on the volume of greenhouse gases the UK can emit during the period between 2033 and 2037. The recommended pathway requires a 78% reduction in UK territorial emissions between 1990 and 2035.

Methodology For Estimating Pathways

Scenarios and emissions pathways are a plausible description of how the future might unfold. These are used to explore possible long-term trajectories and the effectiveness of possible mitigation strategies. Scenarios are -qualitative narrative and/or quantitative – projections of global changes in greenhouse gas emissions resulting from the integrated implementation of policy, changes in behaviour and deployment of technology. The set of assumptions that underpin scenarios can be adjusted to reflect a set of different scenarios to understand the range of alternatives futures and uncertainty associated with them[25].

An emission pathway is a modelled trajectory of emissions and, therefore, a part of a scenario. There are diverse methods to quantify scenarios using different models[26]. These pathways scenarios are not forecasts but rather show the scale of possible changes under a set of assumptions underpinning estimates.

For South Holland District Council, three pathways have been considered under the following scenarios:

1) **Baseline SHDC:** This scenario considers the business-as-usual scenario of the CCC's Sixth Carbon Budget report, showing a future in which current national level policy is implemented without further changes.
2) **Net Zero by 2040:** This scenario explores a trajectory for adopting and achieving East Lindsey and Boston's Net Zero operations by 2040 targets. The achievement of Net Zero considers a 90% reduction of emissions from 2023 as the base year, using the estimated 2023/2024 Carbon

25 https://www.weadapt.org/wp-content/uploads/2023/05/pathways_and_scenarios-final_0.pdf.
26 Chapter 3: Mitigation pathways compatible with long-term goals.

Baseline, following industry best practice[27]. This approach considers that the remaining 10% will be removed or offset using permanent carbon removal and storage to counterbalance to neutralise residual emissions.

3) **Balanced Pathway of the Sixth Carbon Budget:** The Sixth Carbon Budget[28], required under the Climate Change Act, provides ministers with advice on the volume of greenhouse gases the UK can emit during the period 2033-2037. The Balanced Net Zero Pathway to 2050 was used to develop the UK's Sixth Carbon Budget, which considers moderate assumptions on behavioural change and innovation and takes actions in the coming decade to develop multiple options for later roll-out (e.g. use of hydrogen and/or electrification for heavy goods vehicles and buildings).

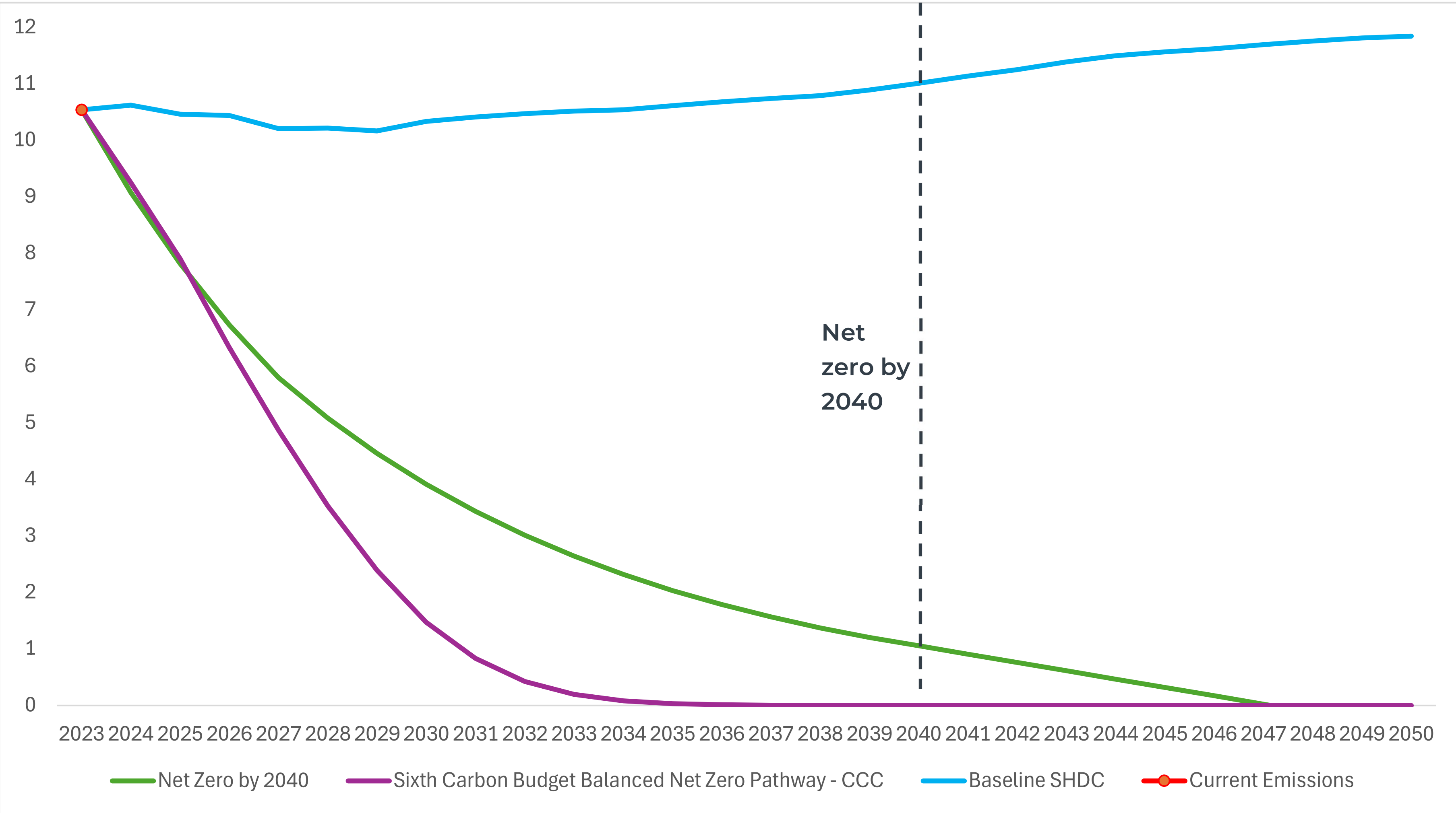
Pathway Results

- To achieve Net Zero emissions by 2040 (reducing GHG emissions by at least 90% from 2023 levels), SHDC's emissions will need to be reduced by 60% by 2030. If the pace of decarbonisation is maintained beyond 2040, emissions will be neutralised by 2050 without the need for offsets or carbon removals. In this scenario, the interim target set by East Lindsey and Boston of reducing emissions by 45% by 2027 will also be met.
- However, the 2040 Net Zero scenario does not consider other factors that could contribute to an increase in emissions, for example population growth or local government investment which might impact the decarbonisation projected using these scenarios.
- The Balanced Pathway of the Sixth Carbon Budget reduces emissions at a faster pace, as the Net Zero scenario for 2040 applies a compound annual growth rate (CAGR), an annual growth rate over a period of time, in this case from 2024 to 2040.
- The gap between the baseline scenario and the Net Zero by 2040 scenario is 96%.
- These scenarios provide an idea of the scale of decarbonisation needed to achieve The South & East Lincolnshire Councils Partnership Net Zero target, the UK's Net Zero commitments and global targets.
- The scenarios outlined below show one possible pathway to decarbonisation, however the Council could quantify the estimated carbon emissions impact and more accurately estimate greenhouse gas emissions projections from its operations, and a Net Zero emissions pathway aligned with those aspirations.
- The next section of the report provides a list of actions to reduce emissions in line with the identified hotspots in the SHDC Carbon Baseline 2023/2024.

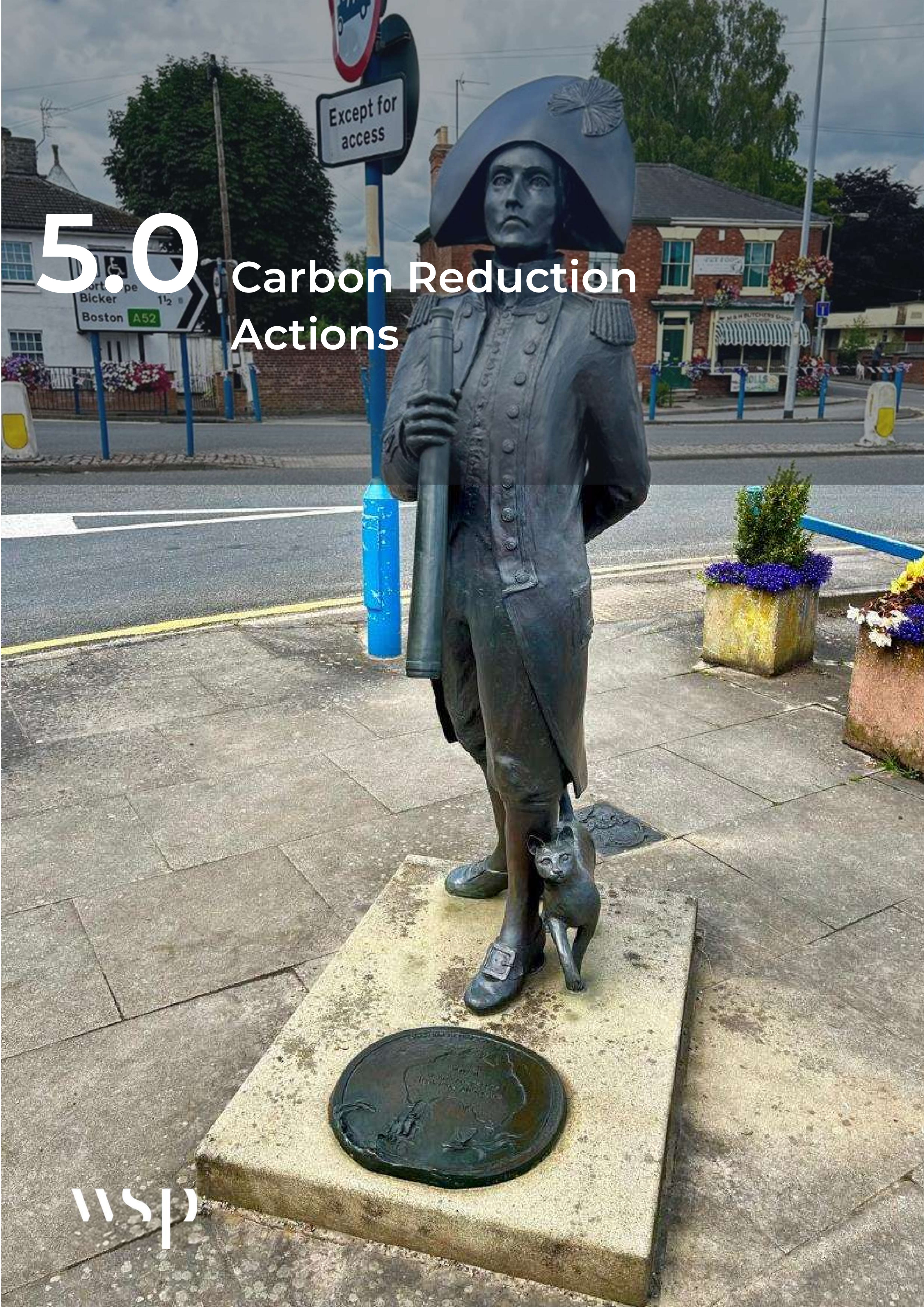
[27] The Corporate Net-Zero Standard - Science Based Targets Initiative. SBTi requirements for companies to achieve net zero (long-term target) requires cutting emissions by more than 90%, using permanent carbon removal and storage to counterbalance the final 10% or more of residual emissions that cannot be eliminated. A company is only considered to have reached net-zero when it has achieved its long-term science-based target and neutralized any residual emissions.

28 Sixth Carbon Budget - Climate Change Committee.

Figure 4.1 – South Holland District Council – Decarbonisation Pathways.



5.0 Carbon Reduction Actions



Carbon Reduction Actions Overview

Using the results of SHDC's Carbon Baseline 2023/2024 and discussions from the SHDC Carbon Baseline Stakeholder Workshop, a number of carbon reduction opportunities are identified These mitigation actions have been categorised based on suggested timeframes for implementation.

Table 5.1 groups carbon reduction opportunities based on the time it would take to complete them. The start date for implementation has been assumed to be early 2025 – for example, short term actions indicate an implementation period of 1-5 years and therefore completion dates may vary between 2025 and 2030, medium term actions assume a period of 5-10 years for completion (ending between 2030 and 2035); and long term actions could take 10 years or more to fully implement (ending as early as 2035).

The next step for SHDC is to prioritise a selection of these actions, as not all of them can be implemented simultaneously.

The following carbon reduction opportunities (see Table 5.1) have been compiled in a separate excel document which also includes an estimate of carbon avoidance potential and costs for implementation to support prioritisation of actions, these results are also summarised in **Table 5.2**.

Table 5.1 – Carbon Reduction Opportunities.

Timeframe	Mitigation Actions (Carbon Reduction Opportunities)
Short term (2025 – 2030)	• Conduct a solar PV feasibility study across all properties owned by the Council. • Provide energy savings training to all SHDC staff to encourage and enable energy saving behaviours. • Create a sustainable business travel policy. • Encourage staff uptake of EVs and active transport through the provision of discounts and behavioural incentives. • Engage occupants of social housing to raise awareness of energy saving measures they could take. • Update sustainable procurement policy to prioritise suppliers with strong environmental credentials. • Reduce consumption of single-use items and promote reduce, reuse and recycle through the implementation of the sustainable products policy[29] adopted across the South & East Lincolnshire Council's Partnership.

[29] Sustainable Products Policy - South Holland District Council

Timeframe	Mitigation Actions (Carbon Reduction Opportunities)
Medium term (2030 – 2035)	• Transition refuse vehicle fleet to HVO fuel as a low-emissions alternative as part of a long-term approach to reduce emissions from vehicle fleet. • Transition remaining EV fleet where possible and install EV chargers at owned facilities. • Work with third party operators to deliver eco-driver training to upskill refuse vehicle drivers. • Analyse refuse collection timetables to identify route optimisation opportunities. • Conduct energy audits of owned sites to identify opportunities to enhance fabric and reduce energy consumption. • Ensure new Council-owned buildings are designed to be low carbon and retrofit the current building stock. • Increase recycling rates across the Council's estate through improved recycling facilities and communications.
Long term (2035 onwards)	• Transition refuse vehicle fleet to electric vehicles and install sufficient EV charging capacity. • Assess feasibility of installing solar on more roofs of the social housing stock. • Replace gas boilers in leased properties with heat pumps and/or district heating. • Improve the energy efficiency of the leased properties stock, targeting those with an EPC 'D' rating or lower. • Retrofit owned commercial units to meet minimum energy efficiency standards.

These mitigation actions carbon impact have been assessed, below the carbon benefits has been summarised in Table 5.2.

Table 5.2 – Carbon Reduction Opportunities and their carbon benefits.

Mitigation Actions (Carbon Reduction Opportunities)	Carbon benefits (L,M,H) + info on rationale*
Transition to an electric vehicle fleet where possible. SHDC have multiple vehicles in its fleet which currently run on diesel and could be electrified, namely vans and cars. If implemented, SHDC could look to install EV chargers at its facilities. This action would result into carbon reductions whilst also improving air quality.	L Emissions from these vehicles are not as significant as emissions from refuse vehicles
Work with third party operators to deliver eco-driver training to upskill refuse vehicle drivers on how to improve fuel economy and reduce emissions through more efficient driving practices.	M Refuse vehicles are a large emission source, but the emission saving potential from eco-driving may be limited as it requires a change in behaviour

Mitigation Actions (Carbon Reduction Opportunities)	Carbon benefits (L,M,H) + info on rationale*
Analyse refuse collection timetable to identify opportunities for route optimisation, which could result in reduced fuel consumption.	M Potential carbon savings of optimisation could be substantial as it could reduce fuel consumption
Transition refuse vehicle fleet to HVO fuel as a low-emission alternatives to diesel and near-term solution for fleet decarbonisation. This action would have to be explored together with T5 - electrification of refuse vehicles.	H Burning HVO releases significantly fewer emissions than diesel
Transition refuse vehicle fleet to electric vehicles. This would require collaborating with Lincolnshire County Council to identify opportunities and challenges to Electric Vehicle Charge point (EVCP) rollout and partnering with industry and suppliers to roll-out a pilot programme.	H Would result in significant emission reductions, assuming electricity consumed is green. SHDC could ensure this through purchase green electricity, and the grid over time will become cleaner
Conduct a solar PV feasibility study for owned sites to assess opportunity to generate own electricity from renewables	L Solar panels have the potential to significantly reduce electricity consumption, but SHDC electricity consumption is not a major contributor to emissions

Mitigation Actions (Carbon Reduction Opportunities)	Carbon benefits (L,M,H) + info on rationale*
Assess feasibility of installing solar on more of the roofs of social housing stock to generate own electricity	M Solar panels have the potential to significantly reduce reliance on the grid for electricity if installed in a large enough capacity
Replace gas boilers in social housing with heat pumps and/or district heating depending on feasibility studies	H Switching away from a fossil fuel boiler will in the long-term result in large carbon savings as the grid decarbonises. A significant proportion of the social housing stock currently have gas boilers installed
Conduct energy audits of owned site/buildings to identify opportunities to enhance fabric and improve energy efficiency to reduce electricity and gas consumption.	M Audits have the potential to identify energy saving measures
Encourage and enable energy saving/low carbon behaviour by all Council staff.	L-M SHDC's gas and electricity consumption is not a significant source of emissions, although this action has the potential to reduce emissions it relies on behavioural change.

Mitigation Actions (Carbon Reduction Opportunities)	Carbon benefits (L,M,H) + info on rationale*
Introduce a sustainable business travel policy, introducing a sustainable travel hierarchy. The higher up the hierarchy, the more sustainable and greener the travel option. This would prioritise digital communication, where possible, over travelling, and if travelling is unavoidable then public transport and active mobility where feasible.	L Emissions from business travel are not a significant source of emissions
Encourage uptake of EVs and cycling amongst employees through provision of discounts and behavioural incentives.	L Emissions from employee commuting are not a significant source of emissions.
Improve the energy efficiency of social housing stock identified to have an EPC D rating or lower	H Energy consumption from social housing stock is SHDC's largest emission source by far.
Ensure new Council-owned buildings are designed to be low carbon and through retrofitting the Council's existing building stock	H Significant carbon saving can be achieved through use of sustainable construction practises/materials.
Complement retrofit of social housing with engagement on energy saving measures, through training, communication materials and other forms of support. This could result into more significant carbon reduction from retrofit as users' behaviours can contribute to a gap between designed and actual performance.	M Energy consumption from social housing stock is SHDC's largest emission source by far. However, carbon benefits will rely on behavioural changes which will depend on the uptake and implementation of the advice offered.

Mitigation Actions (Carbon Reduction Opportunities)	Carbon benefits (L,M,H) + info on rationale*
Retrofit Council-owned commercial units to meet minimum energy efficiency standards	M The energy consumption of SHDC's leased commercial units are not a significant source of emissions, but carbon can be reduced by making units more energy efficient.
Extend sustainable procurement policy to include prioritising suppliers with strong environmental credentials and integrating sustainability criteria into vendor selection to reduce emissions	H Adhering to a robust sustainable procurement policy will contribute to a reduction in Scope 3 emissions (which are not currently calculated)
Reduce single use plastic use across the Council through the implementation of the Sustainable Procurement Strategy	M As emissions from goods procured are not currently quantified, we have assumed these emissions could be medium as there might be a substantial procurement of single use materials but it's currently being addressed with the implementation of the policy.
Increase recycling across the Council's estate through improved recycling facilities and communications and advocacy	L Currently emissions from waste do not represent a significant source of emissions, however estimations did not include waste processed by the Council generated by households/businesses, which would increase the carbon emissions estimates. If these are currently not recycled the impact of recycling could be considerable.

* *Low carbon benefits are in red, as they are the least desirable. Medium carbon benefits are in amber. High carbon benefits are in green, as they are the most desirable.*

These mitigation actions have been identified based on hotspots and understanding of existing policies and programmes.

6.0 Recommendations

Recommendations for the Carbon Reduction Plan

Delivering Change

- The Carbon Baseline has identified two significant emissions hotspots, SHDC's leased domestic properties and refuse vehicle fleet, which SHDC had planned to focus its future actions as they could lead to significant emissions reductions. The Council should continue to engage with SHDC officers and Councillors to identify the steps required to progress the implementation of the mitigation actions, including responsibilities, and potential sources of funding, such as central government grants or partnerships with other institutions and private companies.
- As part of the transition towards electrification of refuse collection vehicles, we have suggested evaluating the use of HVO as an alternative fuel and providing eco-driving training to drivers to improve not only vehicle performance but also the use and operation of refuse collection vehicles. Complementing these measures with a review of refuse collection vehicle route optimisation could also contribute to reducing emissions from refuse collection vehicle fleets, which can account for around 17% of avoided emissions[30].

Data gathering and Integrity

- Resources and efforts need to be invested in improving the quality and integrity of activity data. For example, energy data, mainly electricity and gas consumption, have been found to be of lower quality than typical Council data. Issues have been detected with outliers (for example monthly readings too low or too high compared to average electricity consumption) in the datasets. Not only does this affect GHG estimates but ensuring proper and accurate meter readings could certainly benefit Council energy bills.
- If significant changes are made to the scope of SHDC Carbon Baseline or methodology, the Carbon Baseline should be re-baselined. For example, changes to the scope could be the inclusion of emissions for capital goods and services, which are typical an emissions hotspot for local authorities or the inclusion of waste management from households and businesses managed by the Council. The capital goods and services provided to the Council categories were excluded from the scope of the Carbon Baseline 2023/2024 due to limited data availability.
- The Council should continue to use and update the SHDC Carbon Tool to update future carbon emissions and check progress on Net Zero targets. The tool could support the reporting and monitoring of progress towards decarbonisation and SHDC's Net Zero target.
- As a first step, the Council should confirm their desired targets and pathway to Net Zero targets. Nonetheless, the pathways assessed in this report could be further developed with more detailed assessment of the impact of mitigation actions, quantifying emissions avoidance, thus complementing the quantitative assessment completed for this plan.

Targeting Hotspots

- In particular, to improve energy efficiency in Council properties and therefore reduce carbon emissions, a strategic and phased approach is required, prioritising the lowest performing properties, such as those with an EPC band D or lower. Significant work is already underway to improve SHDC's housing stock. There is still an opportunity to reach out to commercial property

30 How Much Money and Emissions Can Collection Route Optimization Save?

tenants as there could also be opportunities to not only improve energy efficiency but to generate their own electricity.

- Explore opportunities through S106 and social value procurement[31] policy to embed the carbon reduction plan in procurement. For example, Islington Council in its Commissioning, procuring and contract managing Social Value in Islington Supply Chain[32] mentions how in a construction contract they could include a community benefit clause which requires the employment of trainees or unemployed people, increasing green skilled workers.
- The selection of priority measures should consider the key hotspots currently identified, as this would affect the largest source of emissions. Costs and potential sources of funding will also need to be assessed to determine SHDC's desired course of action.

31 Social Value is defined through the Public Services (Social Value) Act 2012 (Act) which came into force in January 2013 and requires all public sector organisations (and their suppliers) to look beyond the financial cost of a contract and consider how the services they commission and procure might improve the economic, social and environmental well-being of an area.

32 Social Value in Islington.

7.0 APPENDIX

Appendix – A

Table 3. The Scope 2 Market-based Approach Hierarchy.

Market-based options	Description	Precision
Energy attribute certificate (EAC)	Energy attribute certificates allow users to report that the electricity they consume is from renewable sources and emits 0 tCO_2e/MWh at the point of production (except for biomass generation). Examples of EACs are RECs (renewable energy certificates) and GOs (guarantees of origin).	HIGHER
Power purchase agreement (PPA)	Similar to EACs, direct electricity contracts such as PPAs, can also convey zero carbon emissions associated with generation.	
Supplier-specific emission rates	Green electricity products from energy suppliers. This can be a valid approach when electricity markets are liberalised, and consumers have effective options of different suppliers and suitable tracking mechanisms and methodologies are in place for a harmonised approach on calculating the emissions factors for all suppliers in a given grid. This is largely the situation in Europe.	
Residual mix	A residual mix emission factor represents the emissions and generation that remain after certificates and contracts have been claimed and removed from the calculation. Residual mix factors are the preferred market-based default emission factor when it cannot apply one of the emission factors above. This is because the use of residual mix emission factors avoids double counting of the emissions attributes of contractual instruments. However, currently, residual mix factors are not widely available (available in European jurisdictions).	LOWER
Default to location based	If the residual mix is not available, then the location-based method shall be used.	

WSP.COM/EN-GB