NET ZERO LEISTON

# A Net Zero Pathway for Leiston

**Building Tomorrow.**

**Together.**

**Today.**

Opergy

# Contents

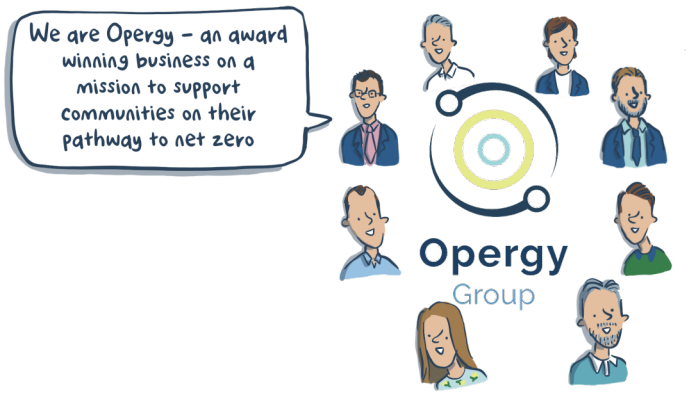
# A little about us...


## Acknowledgements

This report is all about you and your community and the team at **Opergy would like to extend their heartfelt thanks to Net Zero Leiston, for their invaluable engagement and support throughout this process.** Commissioned by Net Zero Leiston and Sizewell C, our aim has been to use our knowledge to support you in designing a pathway towards Net Zero. Leiston's enthusiasm, insights, and commitment have been instrumental in shaping a comprehensive and forward-thinking plan. We sincerely hope that this document further supports residents of Leiston to understand how to effectively contribute towards meeting our nation's climate change goals in a manner that benefits and works for the people and place where you live.


## Who are Opergy?

But who are we, and why are we doing this?




We focus on place-based, people centric solutions and initiatives. Here is an introduction to four of our key team members involved with this project:

***Amelia Fuller*** is a Consultant at Opergy and the driving force behind this Net Zero Pathways project. Born and raised in Norfolk, she has a Geography degree from the University of East Anglia, where her pride in the landscape and communities of East Anglia grew. **Amelia is passionate about helping people in East Anglia to tackle climate change effectively and creating solutions to this challenge that work for the people and places she cares about.**

***Dr Jonny Ruffell*** is an Energy Transition Consultant at Opergy. An East Anglian at heart, Jonny uses his scientific training to model emissions and project robust and achievable pathways to Net Zero for people, places and businesses in the region. He sees a lot of opportunity in the global energy transition away from fossil fuels that can benefit people and places in East Anglia. He is passionate about communicating that, **if we can work together, we can make a significant dent in the UK's carbon emissions at the same time as making our lives cleaner, greener and healthier.**

***Chris Blincoe*** is Associate Director for Net Zero at Opergy. He lives in the countryside just south of Norwich with his wife Kate and two children, very close to the neighbouring family farms where he and Kate grew up. After being inspired by his upbringing and later studies in Environmental Science at the University of East Anglia, **Chris spent over a decade working on projects and programmes to support communities, businesses, local and national government to understand and begin to address the challenges faced from climate change.** Since joining Opergy in 2023, after a 15-year career in Higher Education, Chris is more motivated than ever to support efforts to alleviate climate change.

***Sam Reade*** is an Energy and Geospatial Analyst at Opergy. Sam has a Geology with Geography degree from the University of East Anglia. He is responsible for this project's report design, format, and data visualisation elements such as tables, graphs and maps. Sam is passionate about data communication, visualisation and helping different audiences better understand their data to inform their decision making.

# Net Zero Leiston

## The start of the journey...

The **Net Zero Leiston (NZL) Project** was initiated in 2020 as a community-driven effort to achieve carbon neutrality in the town of Leiston, Suffolk, by 2030. This ambitious goal was set in response to growing concerns about climate change and the need for local action in line with broader national and international sustainability commitments. The project was spearheaded by Leiston-cum-Sizewell Town Council, supported by a range of stakeholders, including local businesses, residents, environmental groups, and external consultants like **Opergy**, who contributed technical expertise in carbon management and sustainability practices.

### Creation and Vision

The project was born out of the recognition that local communities have a significant role to play in tackling climate change. While national and global efforts are essential, towns like Leiston wanted to demonstrate that grassroots actions can have a meaningful impact on reducing emissions and supporting the transition to a low-carbon economy. In 2019, Leiston-cum-Sizewell Town Council made a public commitment to adopt a 'Net Zero' target, following the UK government's declaration of a climate emergency. The goal was to create a practical roadmap for reducing emissions and improving key sectors, including energy, transport, buildings, and land use.

### Methodology

The NZL project employed a structured methodology to assess Leiston's carbon emissions and identify opportunities for reduction. The process began with establishing a **baseline of emissions** in 2019, which provided a snapshot of the town's carbon footprint at the time. This baseline was developed using available data on energy consumption, transport activity, and land use. Consultants used tools to estimate emissions from vehicles, and applied national benchmarks to assess energy consumption in buildings and land management practices.

The project's approach was designed to be both comprehensive and inclusive, aiming to engage the local community in understanding their carbon impacts and contributing to solutions. Workshops, public consultations, and surveys were used to gather input from residents and businesses, helping to shape the strategy in line with local priorities. The methodology emphasised not only technical solutions, such as renewable energy and energy efficiency measures, but also behavioural changes, such as encouraging active travel (walking and cycling) and more sustainable consumption patterns.

### Impact

The NZL Project had a significant impact in raising awareness about climate change within the local community and stimulating action towards sustainability. One of the early successes was the promotion of home energy efficiency upgrades. The project's emphasis on active travel and sustainable transport is leading to EV charger installations and a new cycle scheme across the community. Educational campaigns were launched to encourage residents to reduce their carbon footprints through small changes in their everyday lives. This resulted in a gradual but noticeable shift in the community's attitudes towards energy use and sustainability. The Town Council's new Neighbourhood Plan will further support these changes with its commitment to carbon reduction, environment and biodiversity.

# Setting the Scene

## Achieving Net Zero

Net zero refers to the state in which the amount of greenhouse gases (GHGs) released into the atmosphere are balanced by the removal or offsetting of an equivalent amount of GHGs. This balance is achieved by reducing emissions as much as possible through sustainable practices and technologies, as well as investing in activities that remove or sequester carbon dioxide from the atmosphere. The goal of Net Zero is to limit global warming to well below 2 degrees Celsius above pre-industrial levels, as set out in the Paris Agreement.

The Greenhouse Gas Inventory covers the seven direct greenhouse gases (GHGs) under the Kyoto Protocol .

These are:

1. **Carbon dioxide ($CO_2$)**
2. **Methane ($CH_4$)**
3. **Nitrous oxide ($N_2O$)**
4. **Water Vapour ($H_2O$)**
5. **Hydrofluorocarbons (HFCs)**
6. **Perfluorocarbons (PFCs)**
7. **Sulphur hexafluoride ($SF_6$)**

The last three of these gases are collectively known as the F-gases.



All these gases contribute directly to climate change owing to their "positive radiative forcing effect" (in other words, when there's more energy radiating down on the planet than there is radiating back out to space, the Earth's surface will continue to warm).

In general terms, the largest contributor to global warming is carbon dioxide, representing around 75% of all GHG emissions. This makes it the focus of many climate change initiatives. Methane and nitrous oxide contribute to a smaller proportion, typically less than 20%, and the contribution of f-gases is even smaller at less than 5% of the total. However, these gases are converted to 'equivalent' amounts of carbon dioxide, thus Net Zero generally refers to carbon dioxide and carbon dioxide equivalents ($CO_2e$).

Across the community, and for the purposes of this study, we will focus on:

1. **$CO_2$ emissions**
2. **$NO_2$ emissions (converted to CO2e)**
3. **$CH_4$ emissions (converted to CO2e)**

# UK Government commitments

The United Kingdom (UK) has taken significant steps in recent years to address the pressing challenge of climate change. Central to these efforts is the country's commitment to achieving Net Zero greenhouse gas emissions.

In June 2019, the UK became the first major economy in the world to pass legislation committing to Net Zero emissions by 2050 compared to 1990 levels. This ambitious target requires the UK to balance the emissions it *produces* with the removal of an equivalent amount of GHGs from the atmosphere. The commitment is enshrined in the Climate Change Act 2008 (2050 Target Amendment) Order 2019.

## UK Government Interim Targets

To support the Net Zero commitment, the UK government has set interim targets to ensure progress is made towards this ultimate goal. These are set out in the UK's Sixth Carbon Budget, covering the period from 2033 to 2037, which was legislated in December 2020 to aid a clear roadmap for transitioning to Net Zero. The targets to reach Net Zero are:

| 2030 | 2035 | 2050 |
|---|---|---|
| 64% | 78% | 100% |

### Energy Transition

The UK shut down coal-fired power generation in 2024 and has significantly increased its renewable energy capacity. The Offshore Wind Sector Deal aims to reach 50 GW of offshore wind capacity by 2030, while recently the government has pledged £20bn over 20 years in support of Carbon Capture and Storage (CCS) for hard -to-abate sectors.

## 2030 Grid Decarbonisation

The UK government has set a target of 2030 to have an electricity grid that is 95% zero emissions. This will include wind, solar and nuclear energy.

### Decarbonising Transport

The UK is promoting the uptake of electric vehicles (EVs) through grants, incentives, and investment in charging infrastructure. The phase-out of petrol and diesel vehicles was set for 2030, but has since been pushed back to 2035. Furthermore, the Transport Decarbonisation Plan outlines measures to decarbonise aviation, shipping, and rail sectors.

### Building Efficiency

The Government has introduced measures to improve the energy efficiency of buildings, including the Future Homes Standard, which aims to ensure all new homes are zero-carbon ready from 2025. This includes no new builds connecting to the gas grid. The Great British Insulation Scheme and Warm Homes: Local Grant Scheme provides financial support for energy-efficient upgrades in existing homes.

### Industrial Transformation

The UK is promoting the decarbonisation of industries through initiatives such as the Industrial Decarbonisation Strategy and the creation of Industrial Clusters. These initiatives aim to support the development of low-carbon technologies and the transition to sustainable industrial processes.

### Nature-Based Solutions

The Government recognises the importance of nature-based solutions in mitigating climate change. The Environment Act aims to establish legally binding targets for biodiversity, waste reduction, and air quality. The Nature for Climate Fund supports projects that restore and enhance natural habitats to capture and store carbon.

# National Net Zero timeline

**2008**

### Climate Change Act

The UK becomes the first country to set legally binding targets under the Climate Change Act. This Act originally mandated an 80% reduction in greenhouse gas emissions by 2050 compared to 1990 levels.

*"Promoting the transition to a low-carbon economy in the United Kingdom through the use of economic instruments"*

**2019**

### Climate Change Act Amendment

The UK government amends the Climate Change Act to commit to Net Zero greenhouse gas emissions by 2050. This update made the UK the first major economy to pass a Net Zero emissions law.

*"Any emissions would be balanced by schemes to offset, such as planting trees or using technology like carbon capture and storage"*

**2021**

### Net Zero Strategy

The UK government publishes the **'Net Zero Strategy: Build Back Greener'**, outlining the pathway to reach Net Zero by 2050. This strategy was released ahead of the COP26 climate summit held in Glasgow, Scotland.

*"Community empowerment, and action can play a role in supporting the UK's transition to Net Zero and enable communities to access the benefits that it brings"*

**2021**

### COP26 - Glasgow

The UK host COP26 in Glasgow, playing a pivotal role in international climate negotiations, pushing for global commitments to phase down coal, curtail deforestation, and finance for developing countries.

*"Your actions matter. No action or voice is too small to make a difference."*

**2023**

### Powering Up Britian

UK paper aimed at enhancing the country's energy security, accelerating the transition to renewable energy sources, and supporting economic growth through investments in clean energy technologies.

*"There must be more place-based, locally led action on Net Zero"*

**2023**

### Adapting to Climate Change

The Climate Change Committee (CCC) publishes its 2023 **'Progress in Adapting to Climate Change'** report, giving a damning overview of the UK being 'strikingly unprepared' for climate change impacts such as extreme heat, wild-fires, flooding, storms and food security.

*"Targeted support will be needed at local level to support communities which are particularly vulnerable to climate risks"*


# Net Zero Pathways and the wider UK landscape

The UK will not achieve its Net Zero ambition without Government leadership. However, local precedence and active engagement of the people and organisations living across the nation's regions will also be pivotal to achieving this feat. Many of the urgent changes and decisions that are needed to reduce emissions and reach Net Zero have a strong local dimension.

Differences between areas can be striking, such as demographics, local government structures, energy resources, housing stock, landscape or economy. This means that diversity of approaches to decarbonising the UK is vital: there is no one-size-fits-all recipe.

At the same time, there is already a growing amount of experience and expertise from those at the forefront of action that can be drawn on.

Many communities have been quick to respond to the climate emergency. Over 300 Local Authorities – about 75% - have declared climate emergencies. More than half of these councils have already adopted a Net Zero target date of 2030. Many others are delivering climate change plans without declaring an emergency. However, for most, details around implementation programmes – sometimes called climate action plans - and delivery remain very high-level or in some instances non-existent. At the same time, there is growing recognition that the resources and skills available to them may not be sufficient to meet the significance of this challenge.

So how can we help your community to: visualise your own contribution to mitigating against and adapting to the impact of climate change; and understand how interventions you make can help to achieve it? With help from your very own Net Zero Pathway.

# A sustainable transition

The transition to a sustainable society necessitates comprehensive efforts to reduce greenhouse gas emissions and balance any remaining emissions with carbon removal techniques. This chapter delves into the intricacies of the Net Zero transition, focusing on the significance of defining a '**community**' for carbon baselining, your carbon budget, and outlining the route-map to get there.

## Defining a Community

In the context of carbon baselining, the notion of 'community' extends beyond its conventional definition. It encompasses residential areas, businesses, public institutions, and various stakeholder groups within a specific geographical location, such as your rural town.

To successfully achieve a community Net Zero transition it is crucial to understand and embrace the unique characteristics of your community. Recognising the importance of understanding Leiston as a community lays the foundation for a community-led approach that promotes behavioral change and secures community buy-in to lower emissions.

- Tailoring solutions to **Local Needs**
- Promoting **Behavioral Change**
- Building **Social Cohesion** and Collaboration
- Securing **Community Buy-In**
- Maximising **Local Benefits**
- Enabling **Decision Making**
- Using **Detailed Local Data**

## East Suffolk's Commitment

East Suffolk is committed to achieving Net Zero emissions through the East Suffolk Climate Action Framework, which outlines specific actions for the council and the wider community.

### Council Initiatives:

East Suffolk Council aims to become carbon neutral by 2030 by focusing on reducing its operational emissions. Key efforts include transitioning the council's fleet to electric vehicles, retrofitting buildings with energy-efficient systems (such as solar panels and heat pumps), and investing in renewable energy. For example, solar panels have been installed on council buildings, such as the Riverside building in Lowestoft, to reduce energy consumption. The council is not acting alone and has supported development of the Suffolk Climate Emergency Plan.

### Area-Wide Projects:

East Suffolk plays a significant role in supporting the UK's renewable energy sector, particularly through offshore wind. Projects like the Galloper Wind Farm and East Anglia One contribute significantly to reducing UK carbon emissions.

The council also promotes energy efficiency through the Warm Homes Suffolk scheme, helping residents retrofit homes with low-carbon solutions. Community projects, such as the Solar Together initiative, enable residents and businesses to invest in solar power through group buying schemes.

# Leiston: An overview

Leiston is a historic town in East Suffolk, known for its industrial heritage and close ties to the energy sector. Situated near the coast, Leiston is home to **Sizewell**, a key site for the UK's nuclear power generation, including the old Sizewell A site, the current Sizewell B site and the Sizewell C project which is in construction. The town also features **Leiston Abbey**, a striking medieval ruin, the **Long Shop Museum**, which celebrates its engineering history, and the 110 year old **Leiston Film Theatre**.

## Population

**5800**

As per the 2021 census data **total population** is:

## Over 65s

As per the 2021 census data the population **over 65** is:

**1438**

## Under 15s

**893**

As per the 2021 census data the population **Under 15** is:

## Key Listed Buildings

- **Leiston Abbey** (Grade I Listed)
- **The Long Shop Museum** (Grade II Listed)
- **St. Margaret's Church** (Grade II Listed))
- **The White Horse Inn** (Grade II Listed)
- **Leiston House** (Grade II Listed)
- **Post Office** (Grade II Listed)

| Property Type | Count |
|---|---|
| Detached | 661 |
| Semi Detached | 1172 |
| Terraced | 1016 |
| Flat | 362 |
| Other | 298 |
| **Total** | **3,509** |

## Community Groups

Leiston has a number of community-focused groups that benefit the whole of Leiston. These include:

- The Leiston Community Land Trust
- The Leiston Good Neighbour Scheme
- The Live Well Hub
- The Rose and Sweet William Club

| Vehicle Type | Registered 2023 | Registered 2019 |
|---|---|---|
| Petrol/Diesel | 3905 | 3592 |
| Motorcycle | 280 | 244 |
| EV | 25 | 0 |
| **Total** | **4210** | **3836** |

## Key Roads

Leiston is served by three key B roads. The **B1119** eastwards to Saxmundham, the **B1122** running south east to Aldeburgh, and the **B1069** running south west to Coldfair Green and Friston. These roads also provide vital links to the A12.

### Did You Know?

Leiston is home to one of the UK's oldest purpose-built cinemas! The Leiston Film Theatre opened in 1914 and has been entertaining audiences for over a century. Saved from closure in the 1970s by the Town Council, it's now a cherished community venue offering films, live performances, and special events—all while retaining its historic charm.

# Creating a Pathway

**1 Community Emissions Baseline**

Conducting a carbon baseline assessment for Leiston considering key emissions sectors; buildings, transport, agriculture, and land use.

Compare findings with the original 2019 baseline of Leiston. Review any methodology differences and identify significant changes to carbon emissions.

**Comparison with 2019 baseline 2**

**3 Engagement with Sizewell C & Net Zero Leiston**

Engagement with those at the heart of Leiston's Net Zero Journey so far to ensure findings are complimentary to existing plans and inform future plans.

Presentation to the Steering Group to share learnings, and to gain feedback and insights as to suitable interventions to use for carbon reduction modelling.

**Feedback from Net Zero Leiston Steering Group 4**

**5 Carbon Reduction Modelling**

Using the information gathered throughout each of the previous phases, and alongside computer modelling, carbon reduction possibilities for Leiston were created, looking at different opportunities, barriers, and local characteristics.

Selecting the most appropriate pathway for Leiston to reach Net Zero. This includes understanding priority interventions, financial costs, and timelines for achieving Net Zero.

**Pathway Creation 6**

# Common questions on Net Zero

## Key questions regarding Net Zero, climate change and sustainability:

### Is Climate Change real and accelerated by humans?

Yes, climate change is real and occurs naturally, but is being accelerated by human activities. Average global temperatures have risen by about 1˚C since the late 19th century, largely due to increased greenhouse gas concentrations from burning fossil fuels, deforestation, and industrial processes. Despite this seemingly small change at first glance, this 1 degree increase dramatically affects natural processes around the world. Over 97% of climate scientists agree that human activities are the main driver of recent climate change.

### Why should the UK take action if other countries are bigger polluters?

The UK should take action because it has a historical responsibility as one of the first industrialised nations and has contributed significantly to past emissions. By acting, the UK can set a moral example, encourage global cooperation, and benefit economically through job creation and reduced health costs from pollution reduction. Additionally, the UK is also vulnerable to its own climate impacts such as more frequent flooding and heatwaves, impacting our lives.

### Isn't the climate always changing? How do we know this change is different?

While the climate has always changed, the current rate and causes of change are unprecedented. The present warming is occurring ten times faster than the average rate of ice-age-recovery warming. Human influence, such as greenhouse gas emissions, closely matches the specific patterns of warming observed today, which natural factors alone cannot account for. Scientific studies have isolated the human contribution to being the driving factors of these changes.

### What difference can one person or one community make to tackling climate change?

One person or community individually will not make a massive difference but collectively communities can make changes that make a significant impact on tackling climate change. Individual choices, such as reducing energy consumption, using public transport, and adopting a more plant-based diet, collectively reduce greenhouse gas emissions and help to reduce bills at the same time!

Communities can amplify these efforts by implementing local renewable energy projects, promoting recycling, and advocating for sustainable policies. Grassroots movements have historically driven substantial environmental changes, demonstrating the power of collective action. Moreover, influencing others through awareness and education creates a multiplier effect, leading to broader societal change both locally and globally, inspiring others to follow.

### Are the economic costs of reducing emissions too high?

The benefits of reducing emissions are significantly outweighed by the costs of not implementing these changes. Benefits include the creation of jobs, improved public health, and avoided costs of climate impacts. Investing in renewable energy, energy efficiency and sustainable practices can stimulate economic growth and innovation. The cost of inaction would result in impacts like high costs fixing damages caused by extreme weather events and hospital impacts and risk to life from extremely cold winters, extremely hot summers and more powerful storms.

### Isn't renewable energy unreliable and expensive?

Renewable energy technologies have become increasingly reliable and cost-effective. Advances in technology, economies of scale, and competitive markets have reduced the costs of solar and wind energy significantly. Renewable energy provides long-term price stability and reduces dependence on imported fuels, enhancing energy security.

# Leiston's Carbon Emissions

# Land emissions

The term "**land use**" refers to the way we utilise land resources for various purposes, such as agriculture, urban development, forestry, and infrastructure. Land-use change refers to alterations in land cover, including deforestation, afforestation (*establishment of a forest or stand of trees in an area where there was no recent tree cover*), reforestation (*the process of planting trees in a forest where the number of trees has been decreasing*), and conversion of land from one use to another. Forestry activities encompass the management and conservation of forests, including forest planting, harvesting, and protection.

The land use sector is vital in climate change mitigation because land-based activities can either remove carbon dioxide ($CO_2$) from the atmosphere, acting as a sink, or release $CO_2$ into the atmosphere, acting as a source. Forests, for instance, absorb $CO_2$ through the process of photosynthesis, storing carbon in trees and vegetation. This makes them an essential natural carbon sink. Conversely, deforestation and forest degradation lead to the release of stored carbon and prevention of future absorption, contributing to greenhouse gas emissions instead.

The table below uses **Kilo Tonnes CO2e** to compare land emissions on larger scales from 2022:

| Region | LULUCF | Agriculture | Cropland | Forest land |
|---|---|---|---|---|
| **UK** | 757.9 | 49,581 | 9,346 | -18,255 |
| **Suffolk** | 107.6 | 710.7 | 143.6 | -215.2 |
| **East Suffolk** | 2.1 | 229.6 | 48.4 | -72.9 |

How land is used impacts both emissions mitigation and climate change adaptation. Proper land management practices can enhance ecosystem resilience, contribute to water management, prevent soil erosion, protect biodiversity, and provide various ecosystem services that support human well-being. For example, sustainable forestry practices can ensure the long-term health and productivity of forests, while reforestation efforts can restore degraded ecosystems and enhance carbon sequestration. Supporting all of these complex systems supports both nature and food security.

## Methodology

The land emissions of Leiston were calculated across 3 areas:

### 1. Land

This included aggregating different land types such as; Forest land, Cropland, Grassland, Settlements, and Wetlands.

| Land Category | Hectares | Annual CO2e emissions (kt CO2 per year) |
|---|---|---|
| **Forest Land** | 110 | -1.21 |
| **Crop Land (including fallow)** | 725 | -0.23 |
| **Grassland** | 836 | -1.84 |
| **Settlements** | 142 | 0 |
| **Wetland** | 8 | 0 |

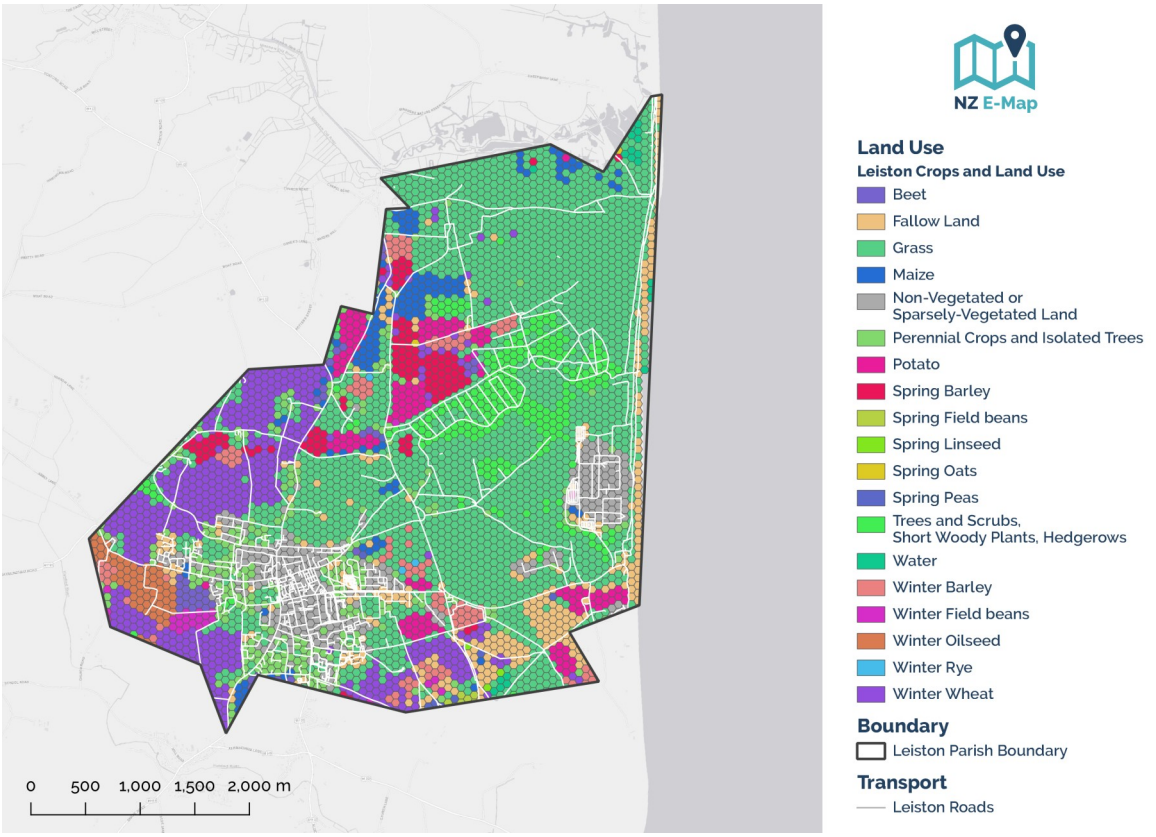
**Results**

The total carbon emissions for Leiston's 'land' is **–3.28 ktCo2e per year.** The **largest proportion** of that being attributed to **Grassland at –1.84 kt CO2 per year**

# 2. Agriculture

Emissions of CO2e associated with the application of fertiliser on crops has been accounted for by considering fertiliser use rates for different crop types (such as sugar beet, potatoes and oats) found within your community boundary.

| Total Crop Hectares (ha) | Total Nitrogen Application (Kg) | Total CO2e (Kt CO2e per year) |
|---|---|---|
| 725 | 76,406 | 0.53 |




*A crop map for Leiston. The data was taken from the Crop Map of England (CROME) data set (2021).*

**Results**

The total carbon emissions for Leiston's 'agriculture' is **0.53 ktCO2 per year** The **largest proportion** of those emissions being attributed to **'Winter Wheat'**.

# 3. Livestock

To calculate the methane emissions from agriculture within the boundary, the National Atmospheric Emissions Inventory data set was used.

| Methane Sum (kg) | Global Warming Potential of Methane compared to CO2 | Total (ktCO2e) |
|---|---|---|
| 3.5 | 81.2 | 0.00029 |

**Results**

The total carbon emissions for Leiston's 'livestock' is **0.0003 ktCO2 per year**.

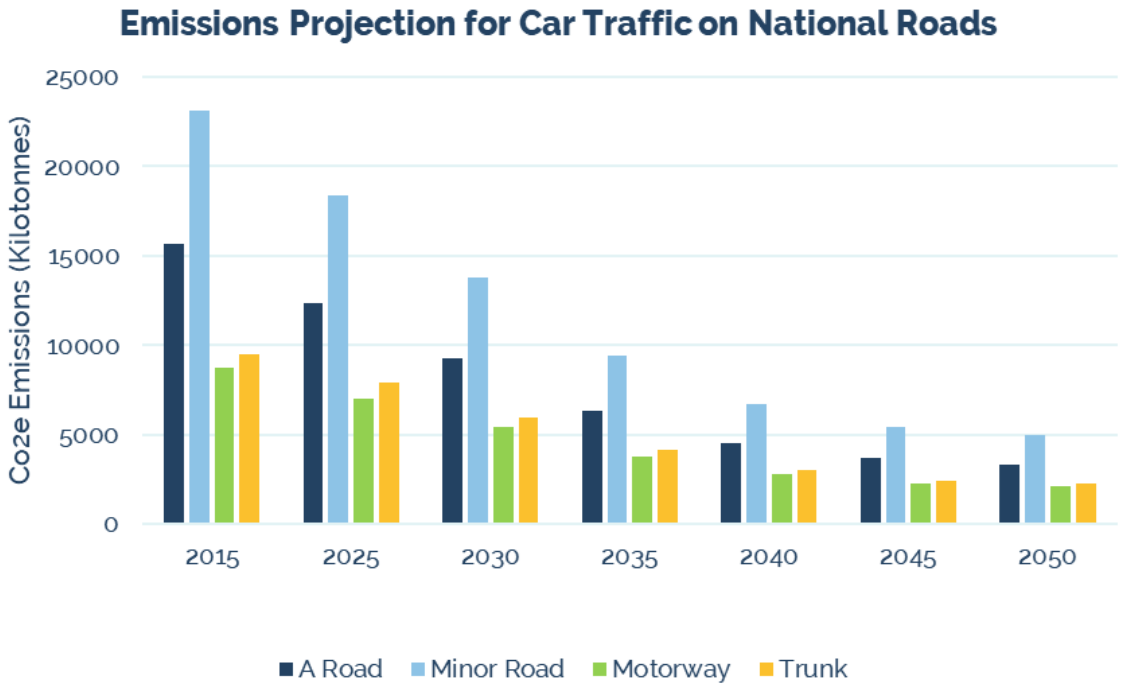
# Transport emissions

Transportation encompasses various modes, including road, rail, air, and maritime, all of which must undergo significant transformation to align with Net Zero objectives. The sector faces unique challenges due to its heavy reliance on fossil fuels, primarily petroleum-based fuels, and the resulting emissions from combustion engines.

It is crucial to have access to accurate and reliable traffic projections in order to understand local emissions associated with road transport and identify appropriate transport related decarbonisation efforts. These projections serve as valuable data points that inform sustainable transportation solutions, such as the number of Electric Vehicle (EV) charging stations an area is likely to need to service growing demand.

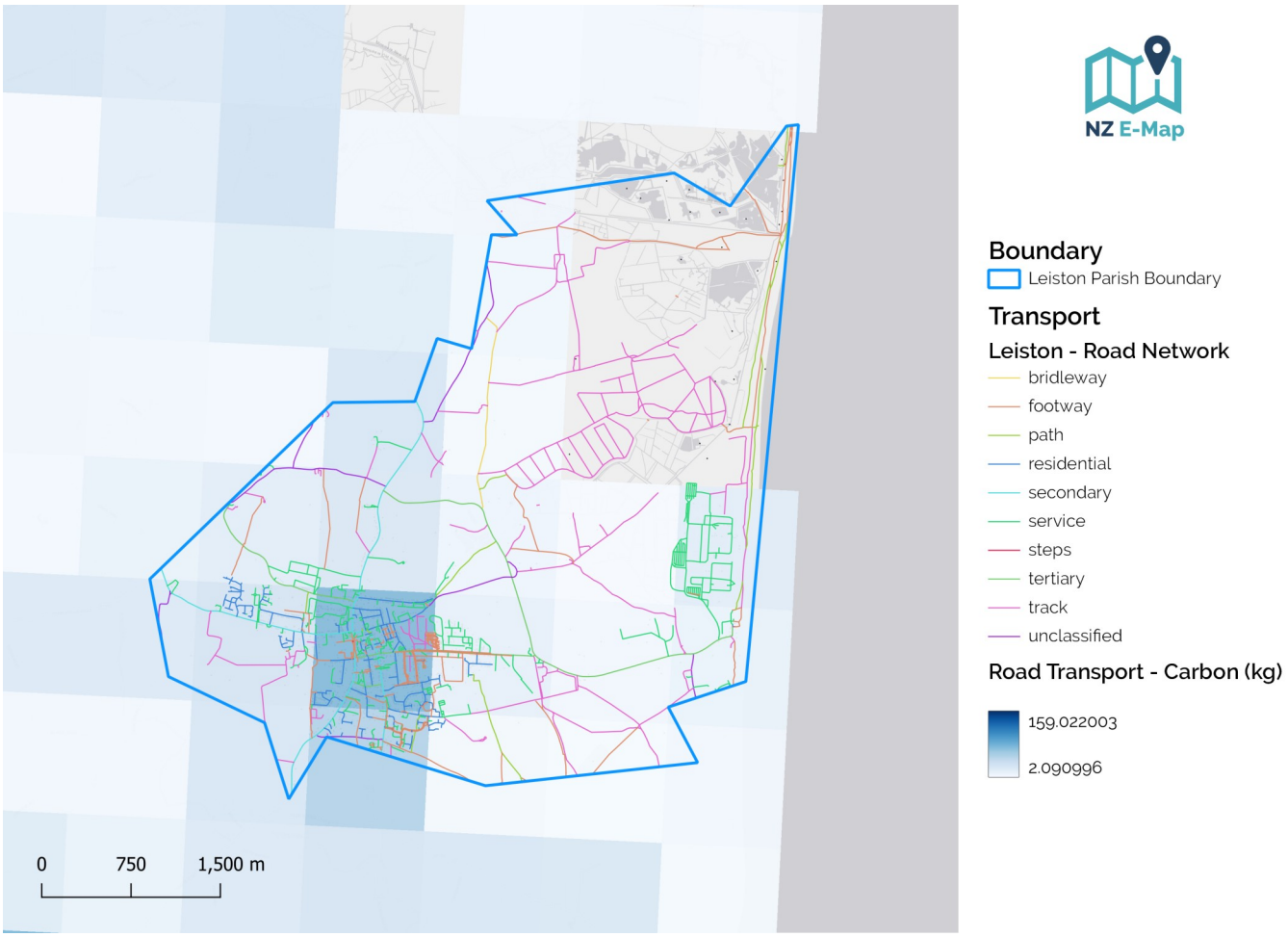
| | Transport Total Emissions (Kilotonnes Co2e) | Number of EV Charging Devices (as of May 2023) |
|---|---|---|
| **UK** | 106.671 | 43,626 |
| **Suffolk** | 1339 | 362 |
| **East Suffolk** | 381 | 92 |

The 2023 UK National Road Traffic Projections provide high-level analysis of traffic patterns and trends as well as insights into the changing dynamics of transportation demand, including the influence of population growth, urbanisation, and economic factors.




# Transport emissions

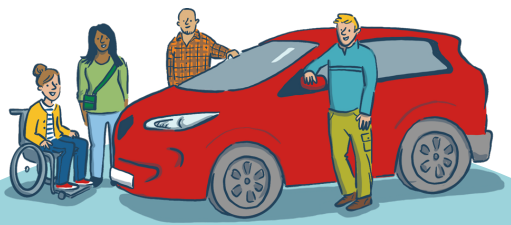
A road network helps to identify the spatial distribution of roadways and transportation routes across the region. This can be used to identify key points of likely higher emissions, in high traffic areas and main routes. Road networks could also be used to influence policy development, such as implementing low emission zones or converting roads to pedestrians only.




*A road map for Leiston. The map displays kg of carbon associated with road transport. To convert from carbon to carbon dioxide the total emissions that fall within the Leiston boundary were multiplied by the atomic weight of CO2 (44/12) to get the final CO2 transport figures for Leiston. Sizewell power station site was excluded.*

Under the National Atmospheric Emissions Inventory (NAEI) methodology, the total distance for road types were analysed alongside the total vehicle counts for the most recent year available. The NAEI dataset was then used to understand road transport emissions within Leiston.

Within Leiston there are a total of **5.0 ktCO2e per year** for road transport emissions.



# Built environment emissions

The 'built environment' encompasses all man-made structures, including residential, commercial, and industrial buildings, as well as infrastructure systems such as transportation networks and energy distribution systems. The built environment is significant because it is responsible for a large portion of greenhouse gas emissions, energy consumption, and resource use.

The UK government has invested £1.75 billion through the Social Housing Decarbonisation Scheme and Home Upgrade Grants for the decarbonisation of buildings.

Most of the buildings in central Leiston are pre 1900, with the secondary major build period being post 1945 for the outer areas of Leiston.

Achieving Net Zero emissions requires a comprehensive and holistic approach to addressing the impact of the built environment on emissions. This involves various factors, including energy efficiency, renewable generation and sustainable materials.

## Methodology

### 1. Domestic Buildings

For properties with EPC certificates, emissions are calculated based on the CO2 emissions stated in the EPC.

| | Detached | Semi Detached | Terraced | Flat |
|---|---|---|---|---|
| Total Number of Properties | 450 | 716 | 742 | 312 |
| Average CO2 per building (tonnes per annum) | 4.2 | 3.7 | 3.2 | 2.1 |
| **Total CO2 (tonnes)** | **1842** | **2843** | **2356** | **643** |

There are a total of **2,265 properties with EPC ratings** within Leiston, producing a total of **7,762 tonnes of CO2 per year (7.76 kilotonnes CO2 per year)**

### 2. Non-Domestic Buildings

Key non-domestic buildings using fossil fuels are listed below:

| Name | Fuel Type | CO2 from Electricity (Tonnes) | CO2 from Heating (Tonnes) | CO2 from Renewables (Tonnes) |
|---|---|---|---|---|
| **Leiston Children's Centre** | Natural Gas | 9 | 29 | 0 |
| **The Waterloo Centre** | Natural Gas | 17 | 37 | 0 |
| **Alde Valley Academy** | Oil | 102 | 131 | 0 |
| **Leiston Leisure Centre** | Natural Gas | 286 | 75 | 0 |
| **The Surgery** | Natural Gas | 32 | 11 | 0 |
| **Leiston Primary School** | Oil | 20 | 94 | 17 |
| **Leiston Enterprise Centre** | Natural Gas | 33 | 16 | 0 |

However, in total there are 7 properties highlighted to be key non-domestic properties, producing a total of **909 tonnes of CO2 per annum (0.91 Kilotonnes CO2 per annum)**

| Sectors | Total (Tonnes CO2) |
|---|---|
| Animal Centers | 7.0 |
| Community Services | 26.3 |
| Dwellings | 502.8 |
| Education | 19.6 |
| Emergency / Rescue Services | 55.7 |
| Hotel / Motel / Boarding / Guest Houses | 28.0 |
| House In Multiple Occupation | 34.0 |
| Industrial Buildings - Applicable to manufacturing, engineering, maintenance and storage / wholesale | 744.3 |
| Leisure - Applicable to recreational sites and enterprises | 373.3 |
| Medical | 5.3 |
| Offices | 84.6 |
| Property Shell | 41.6 |
| Residential Institutions | 48.3 |
| Retail | 251.1 |
| No Sector Given | 74.6 |
| **Grand Total** | **2,296.4** |

In total there are a further 84 non-domestic buildings in Leiston that have energy certificates. In total they create **2,296.4 tonnes of CO2 per year (2.3 Kilotonnes CO2 per year)**. Updating the energy certificates for the priority buildings, particularly the Waterloo Centre and Leiston Leisure Centre, would further refine this figure and recognise recent achievements in their decarbonisation. Some non-domestic buildings do not have EPC certificates, such as Leiston Film Theatre. Getting EPC certificates for these buildings would help planning for their decarbonisation.

## 3. Benchmarking

Any properties that do not have an energy certificate are benchmarked according to their building archetype using benchmarks from properties in Leiston.

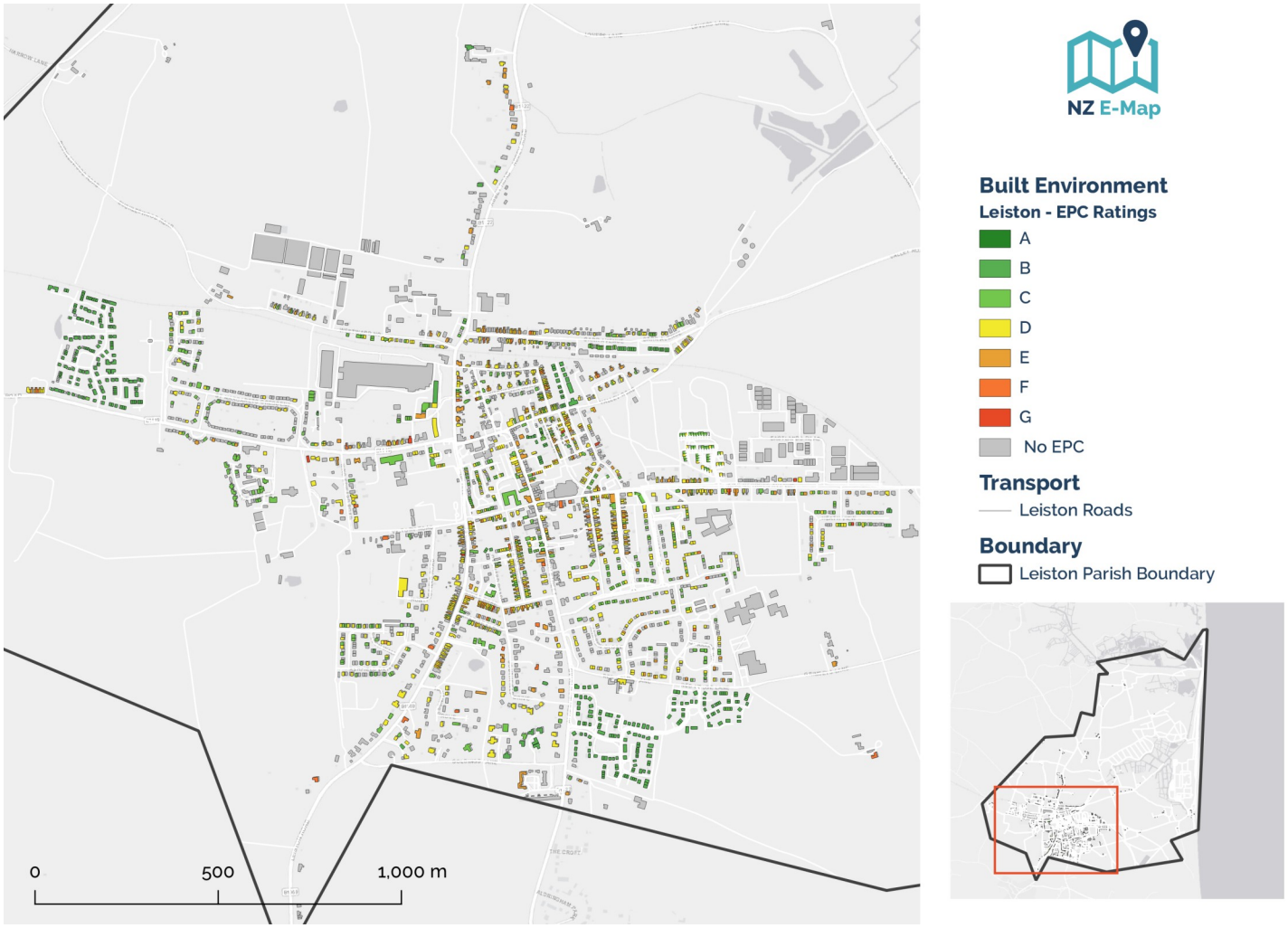
| | Detached | Semi Detached | Terraced | Flat | Other |
|---|---|---|---|---|---|
| Total number of properties | 211 | 456 | 274 | 50 | 207 |
| Average CO2 per building (tonnes per annum) | 4.2 | 3.7 | 3.2 | 2.1 | ~4.2 |
| **Total CO2 (tonnes)** | **886.2** | **1,687** | **876.8** | **105** | **869.4** |

There are a total of 1,198 properties with no EPC ratings within Leiston.

In total, the benchmarking results indicate a further **4,424 tonnes of CO2 emissions per year across Leiston's built environment (4.4 Kilotonnes of CO2e per year).**

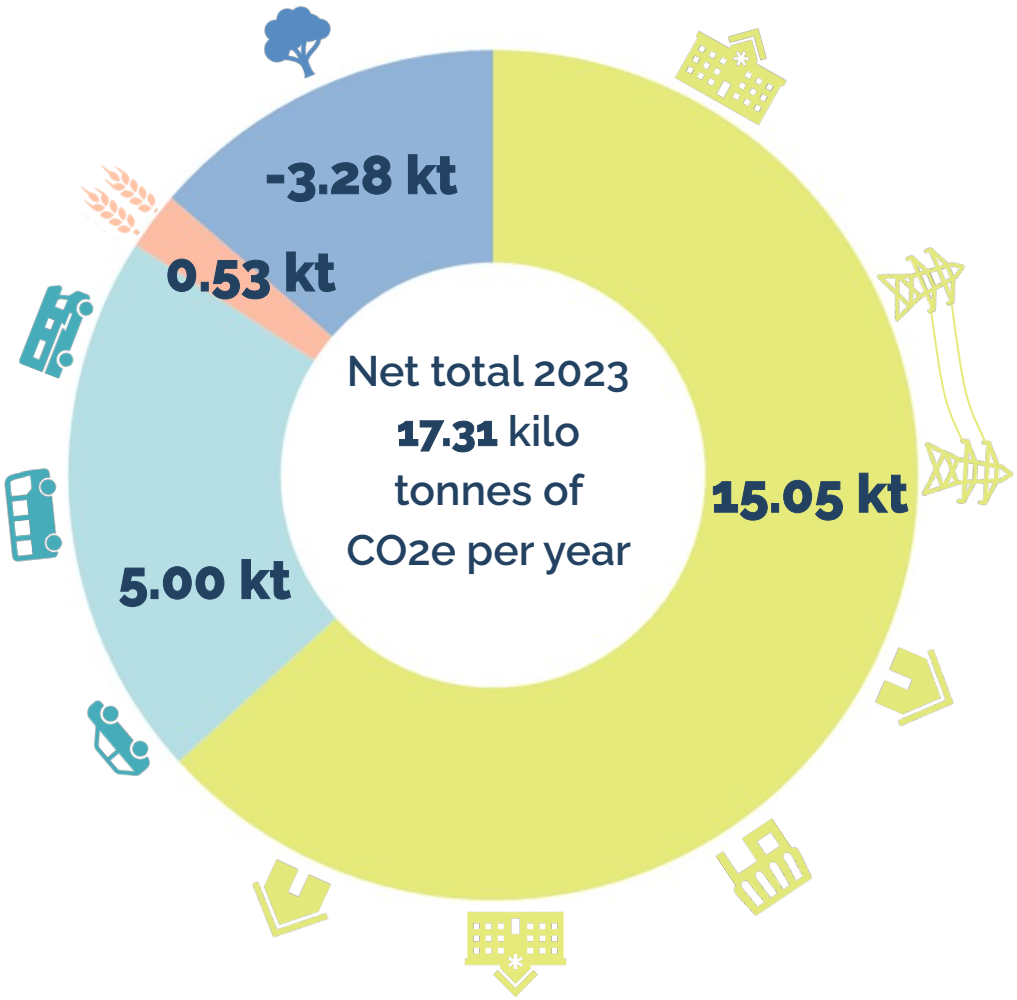
'Other' buildings include schools, places of worship, offices and shops. Given that no EPC data is available for these buildings, the 'detached' CO2 emissions have been selected as the most appropriate alternative to use as a benchmark.

# Energy performance of buildings in Leiston




*A properties map of Leiston. Properties which have an associated Energy Performance Certificate, are ranked via their lettered rating; A—G. A being the highest and most energy efficient, G being the lowest and the least energy efficient. Non-domestic buildings which have separate energy certificates (Display energy and Non-domestic energy) are not ranked on this map, due to using a different ranking system and variables to a standard EPC. The majority of the buildings in grey do not have an associated energy certificate. Sizewell has been removed from this map, and from the carbon baselining process as per the previous Net Zero Leiston methodology.*

# Leiston's emissions summary




| Sector | Updated CO2e emissions for Leiston 2023 (ktCO2e per year) | Previous baseline CO2e emissions for Leiston 2019 (ktCO2e per year) |
|---|---|---|
| Built Environment | 15.05 | 11.6 |
| Transport | 5.00 | 3.83 |
| Land Use | -3.28 | -3.7 |
| Agriculture | 0.53 | 0.3 |
| **Net Emissions** | **17.31** | **12.03** |

# Leiston's Carbon Budget

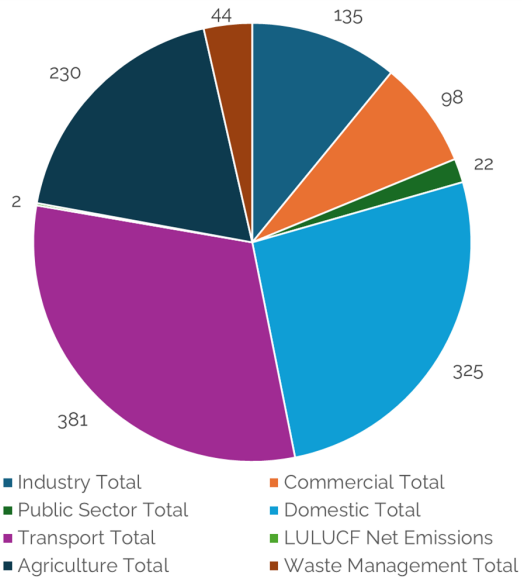
## Carbon Budgets

Carbon budgets are increasingly recognised as an essential tool for guiding climate action and achieving emission reduction targets. A carbon budget refers to the total amount of GHG emissions that can be released into the atmosphere within a specific timeframe, by an area, while still keeping global temperature rise below the limits of the Paris Agreement. The UK sets and reviews its own Carbon Budget every five years.

The Tyndall Centre for Climate Change Research developed a methodology to allocate the global carbon budget to smaller parts of the UK. In order to effectively address climate change at the local level, this UK budget must be disaggregated and further broken down to Leiston.

## East Suffolk & Suffolk Coastal

In 2020 East Suffolk produced a total of 1,336 ktCO2e, with the following breakdown:




**The per capita emissions for East Suffolk were 5 tCO2e.**

The Tyndall Carbon Budget tool uses the old boundary of Suffolk Coastal. For carbon budget purposes, we refer back to the old boundary and the population levels used when it was calculated (2011 census data). Suffolk Coastal has a total budget of 2.8 million tonnes (MtCO2) for the period of 2023 to 2100.

## Leiston

To create a high-level estimate of Leiston's carbon budget, a prorated average of the Suffolk Coastal carbon budget was created. This was done by taking the relevant population census data dividing it by the periodic carbon budgets, and then multiplying it by Leiston's relevant census data .

The table below outlines the carbon budget for Leiston:

| Carbon Budget Period | Recommended Carbon Budget (kt CO2e) |
|---|---|
| 2023 - 2027 | 62.0 |
| 2028 - 2032 | 31.0 |
| 2033 – 2037 | 13.3 |
| 2038 - 2042 | 8.9 |
| 2043 – 2047 | 4.4 |
| 2048 - 2100 | 4.4 |
| **Total** | **124.1** |

The table below outlines the comparative populations and carbon budgets for Suffolk Coastal and Leiston.

| | Suffolk Coastal | Leiston |
|---|---|---|
| 2011 Population (used for budget) | **124,298** | **5,508** |
| Carbon Budget (2023 - 2100) ktCO2e | **2,800** | **124.1** |

Therefore, if Leiston was to **continue emitting GHG emissions at the same rate** of 17.3 kilo tonnes of CO2e per year, **Leiston will have used their entire carbon budget from 2023-2100 by 2030**, or in 7 years from 2023. It is worth noting that some emissions have not been included in the analysis of Leiston (such as waste and industrial process emissions), therefore the speed at which Leiston would use up their carbon budget would likely be faster.

# Comparing Methodology

This page provides a comparison on the 2019 baseline established by Net Zero Leiston (NZL) with the more recent update from Opergy's 2023 results. This is to highlight the key differences in both the data and methodologies used, focusing on the built environment, transport, and land use sectors.

## Built Environment

### NZL Methodology

The 2019 NZL report used the "Primary Energy Consumption" metric for buildings, which was benchmarked against national datasets. This approach focused on energy inputs into the built environment but did not create 'local' benchmarks on specific building types from local energy performance certificates (EPCs).

### Opergy Methodology

The Opergy update, in contrast, utilised the actual $CO_2$ outputs for buildings based on EPC data. Opergy's approach was more localised, reflecting emissions from individual buildings rather than a national energy consumption estimate. The data included approximately 895 buildings that had updated EPC ratings since 2020, allowing for a more refined estimate of emissions tied to building energy performance.

### Impact on Results

The shift from primary energy consumption to direct $CO_2$ output led to a noticeable increase in reported emissions, from the generalised estimate in the NZL report to a higher, more detailed figure in the Opergy update. This suggests that improvements or deteriorations in energy performance since 2020 significantly impacted local emissions, leading to Opergy's reporting of higher emissions.

## Transport

### NZL Methodology

In 2019, the NZL baseline for transport used VISUM, a transport modelling software. This tool estimated emissions by analysing traffic flows and transportation behavior, using vehicle registration data from 2019. The software's models were based on travel patterns and fuel usage specific to that period, but not fully adjusted for updated vehicle emissions standards or changes in fleet composition since then.

### Opergy Methodology

The Opergy update relied on the National Atmospheric Emissions Inventory (NAEI) dataset, a national data source regularly updated with actual vehicle emissions based on more current vehicle registration numbers and types. This dataset provides an accurate reflection of the specific emissions for different vehicle categories, considering advancements in fuel efficiency and electric vehicle uptake between 2019 and 2023.

### Impact on Results

The differences in methodology led to Opergy reporting higher transport-related emissions (5 in the update compared to 3.83 in the NZL baseline). This discrepancy is attributed to the increase in the number of vehicles (from 3,836 vehicles in 2019 to 4,210 in 2023) and potentially higher emissions from certain vehicle categories (e.g. SUVs).

## Land

### NZL Methodology

The NZL baseline in 2019 used a straightforward land-use categorisation approach, measuring emissions based on land types (forest, crop, grassland, and settlements). This approach did not include granular details about crop variations or specific land-use changes within smaller regions of Leiston. The NZL report also lacked consideration for fallow land or smaller-scale land conversions, such as the impact of new settlements around the Sizewell area.

### Opergy Methodology

Opergy's methodology for 2023 incorporated additional variables, including specific crop types and the inclusion of methane and nitrogen fertiliser emissions, particularly in the agricultural sector. It also factored in changes in land use that had occurred since 2019, including the increase in fallow land and more detailed data on specific land conversions.

### Impact on Results

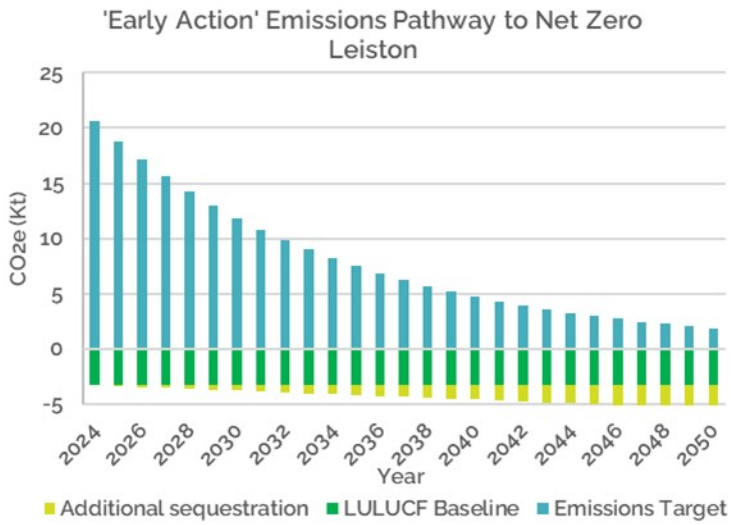
As a result of these differences in methodology, the Opergy update showed more dynamic changes in land use-related emissions. For example, area recorded as grassland increased significantly from 365 to 836 hectares, largely due to the inclusion of previously unaccounted fallow land. Similarly, the more detailed crop data led to a revision of emissions related to agricultural practices, slightly reducing the overall size from crop lands (from 722 to 610 hectares). Settlements, on the other hand, saw a reduction in reported size due to the exclusion of Sizewell C.

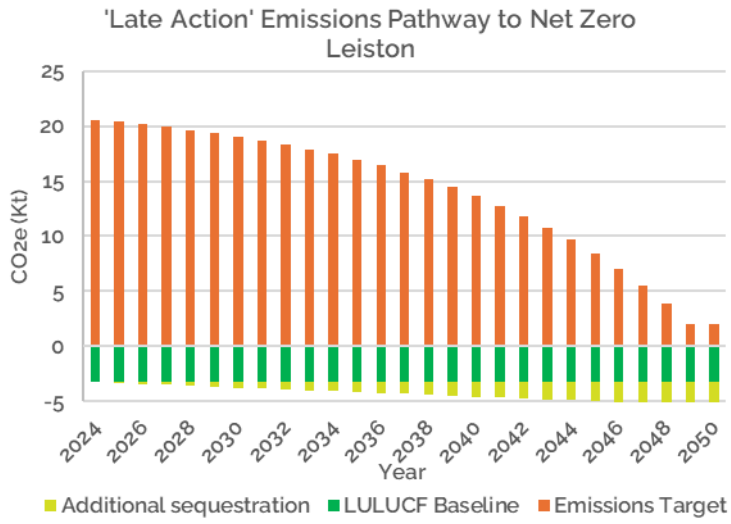
# Creating a Net Zero Pathway

There are many ways that a community can decarbonise, with each path having its own positives and negatives. In order to determine the most appropriate option for Leiston, it is important to take into account several factors including:

- **Leiston's Carbon Budget**
- **Leiston's Net Zero Target**
- **Key Emission Sectors**
- **Leiston's Local Characteristics**
- **Community Views**
- **Financial Opportunities**

The pathway to achieving Net Zero for Leiston involved an approach that combined all of the above. Computer modelling was employed to simulate various decarbonisation options for the Leiston community. These projections were then refined through engagement with the Net Zero Leiston team, ensuring that the pathways reflected local realities and aspirations.




## Decarbonisation Scenarios and Impacts

The amount of CO2 emitted over the same period of time varies significantly depending upon when action is taken in Leiston.

The figure on the left shows a potential **'Early Action'** pathway.

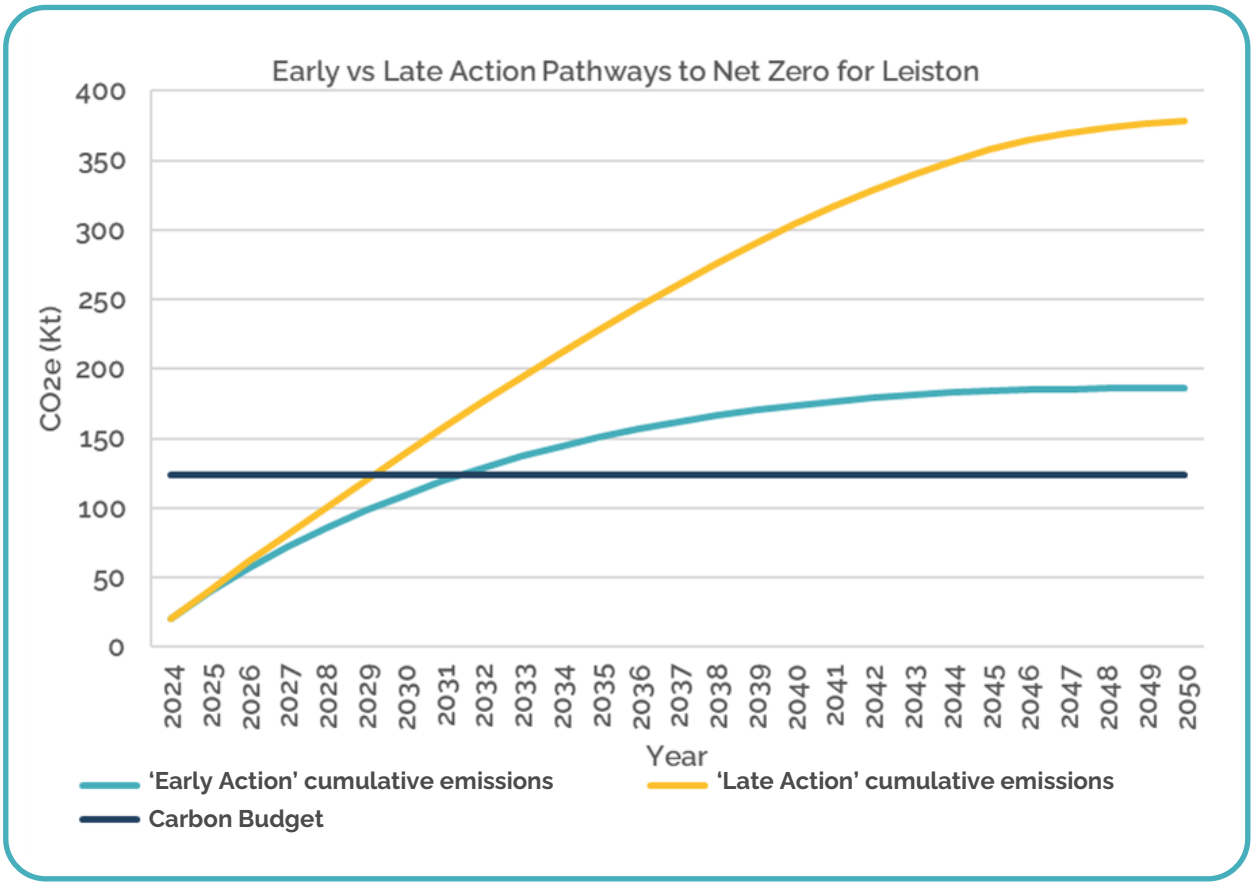
Under this scenario it assumes immediate action is taken to reduce emissions, leading to an earlier peak in emissions and a rapid decline.

In comparison the bottom figure shows a potential **'Delayed Action'** pathway.

This scenario is characterised by a slower start, which intensifies actions in later years, requiring more dramatic changes and improved technologies to meet the 2050 target.

Both indicative scenarios require the same amount of effort but have vastly different outcomes. If By following the **'Early Action'** pathway, the total CO2 emitted (the area under the curve) would be far less than the **'Late Action'** pathway. The **'Late Action'** pathway emits double the total amount of CO2.

The graph on the next page shows these pathways and Leiston's carbon budget of 124.1 kilo tonnes CO2e (the total amount of CO2 Leiston can produce out to 2100 to limit warming to 2 °C). These hypothetical scenarios demonstrate the value of **'Early Action'** over **'Late Action'** and are shown in the figure on the next page.




Based on the above projections if Leiston were to delay taking action it could potentially emit three times as much CO2e as its allocated carbon budget emissions while still reaching Net Zero by 2050.

### Technologies and Strategies for CO2 Management

Achieving decarbonisation and eventually Net Zero as a community will require a combination of individual actions, such as reducing personal fossil fuel use in the home and transitioning to electric vehicles, alongside broader parish-wide initiatives including infrastructure projects and community programs. Within these actions there are several types of interventions:

**ET**

## Enabling Technologies

Enabling technologies are interventions that, do not themselves give an immediate reduction in carbon emissions, but do facilitate further projects that do reduce emissions. For example, the introduction of public EV chargers. The EV chargers do not directly lower CO2 emissions but enable residents to feel more confident in purchasing an EV knowing there are places to charge the vehicle locally.

**RT**

## Reduction Technologies

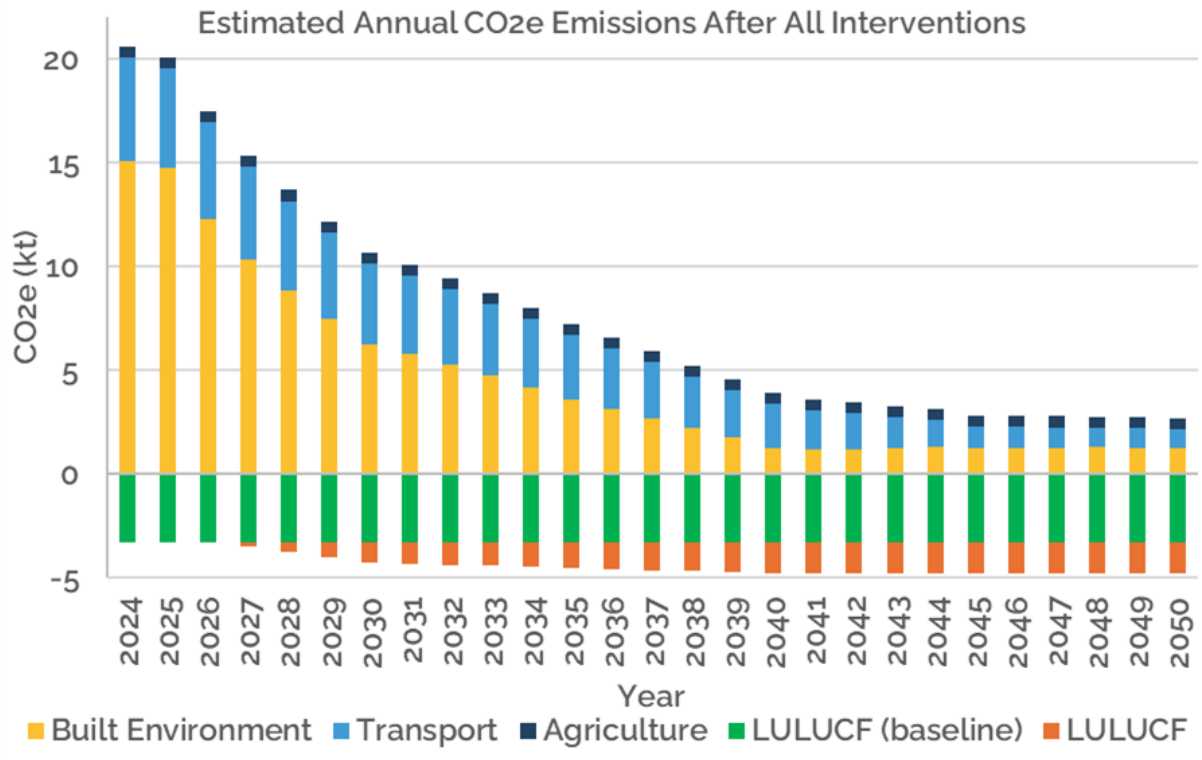
Reduction technologies are interventions or projects that will see an immediate reduction in the areas carbon emissions should they be deployed. Such as the use of solar panels on community buildings and homes to reduce reliance on fossil fuels.

**SE**

## Sequestration Efforts

Sequestration efforts are the only interventions or projects that can capture CO2 that is already in the atmosphere, helping your area to offset its own emissions and reach Net Zero emissions. For example, tree planting initiatives to capture CO2 and they also enhance local biodiversity and community spaces.

# Leiston's Net Zero Pathway

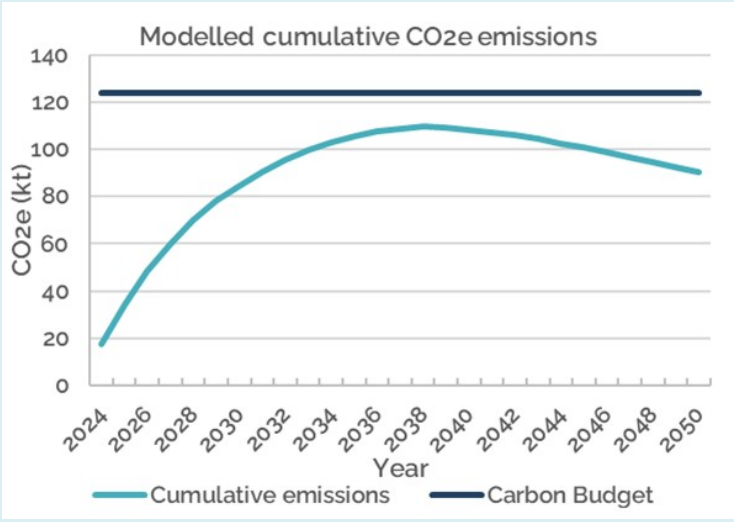



*'LULUCF' stands for 'Land Use and Land Use Change and Forestry'*

The figure above represents an illustrative pathway to Net Zero for Leiston that is achievable by 2040. This takes in to account UK wide decarbonisation, consumer changes, Leiston's unique characteristics, and community feedback. Emissions reduce by over 80% from 2024 to 2050 and sequestration increases (from an already high level) enabling Leiston to hit the UK's legal binding Net Zero target.

Notably, the pathway above does stay within Leiston's carbon budget, as shown by the cumulative emissions graph on the right. This is an ambitious pathway with significant early and sustained action. Thanks to Leiston's significant existing negative emissions from land use, and potential for more sequestration, emissions can both peak before 2040 and become significantly negative by 2050.

The interventions required to achieve this specific pathway are listed over the next pages. Each intervention has a dedicated summary page at the back of this report, which details information on the project, funding opportunities and key case studies people in Leiston to consider.



# Transport

## Key Transport Facts for Leiston:

| Current Public EV Chargers | Current Vehicles Registered | Total Emissions |
|---|---|---|
| 4 | 4210 | 5.0 ktCO2e |

If Leiston aimed to achieve Net Zero in line with the UK government targets, then between 2025 and 2050 Leiston would need to see at least a 90% reduction in transport emissions. **This would mean Leiston needs to lower their transport CO2e emissions from 5.0 to under 0.5 kilotonnes of CO2e per annum by 2050.**

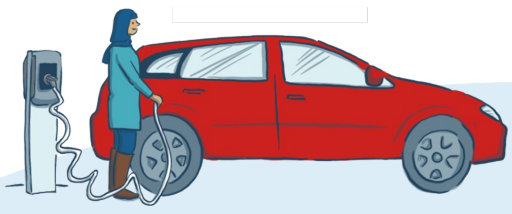
In order to achieve this, Leiston residents would need to decarbonise their modes of transport through a combination of EVs, increased active travel methods (walking, cycling etc) and through greater use of public transport. Local leaders should encourage such actions by making sustainable travel accessible and easy to use.

Based on current government targets, by 2035 the sale of new internal combustion engine vehicles would be prevented. Much of the emissions reduction required within the travel sector will be consumer led.

For Leiston it is predicted that by 2045 around 90% of vehicles driven within the community will be electric. This is based on 100% new electric cars in 2035 enabling a near-100% electric second hand market by 2045. This change alone would account for around a 90% reduction in transport emissions for Leiston. There are several actions that the Leiston community could take that will further aid the transition. Priority actions for transport based on the makeup of Leiston are listed below:

| Intervention | Type | Annual kgCO2 reduction per unit | Number | First install year | Last install year |
|---|---|---|---|---|---|
| Car share scheme | RT | 600 | 10 Cars | 2026 | 2027 |
| E-bike rental scheme | ET | 200 | 18 Bikes | 2025 | 2026 |
| EV Chargers - Fast | ET | 1000 | 20 chargers | 2025 | 2028 |
| EV Chargers - Rapid | ER | 1200 | 8 chargers | 2025 | 2030 |
| EV Buses | RT | 10000 | 4 Buses | 2025 | 2030 |
| Digi-Go | RT | 8760 | 1 Bus | 2026 | 2027 |
| Bike Lanes | ET | 350 | 6 Km | 2026 | 2027 |
| Pedestrianisation | ET | 650 | 3 Km | 2027 | 2029 |
| EV car hire scheme | ET | 600 | 3 Cars | 2025 | 2026 |
| Bike subsidies | ET | 60 | 200 Bikes | 2026 | 2030 |
| Solar Canopy Car Park | ET | 1600 | 20 spaces | 2028 | 2029 |

*The 'type' column refers to the technology, as found on page 25 reduction (RT), enabling (ET) or sequestration (SE).*



# Built environment

## Key Built Environment Facts for Leiston:

| Number of Properties | Number of Properties heated by fossil fuels |
|---|---|
| 3509 | 3106 |

If Leiston aimed to achieve Net Zero in line with the UK government targets, between 2025 and 2050 Leiston would need to see at least a 90% reduction in Built Environment emissions. **This would mean Leiston needs to lower their Built Environment CO2e emissions from 15.05 to under 1.5 kilotonnes of CO2e per year by 2050.** Based on current government targets, by 2030 the UK's electricity grid system should be 95% decarbonised. This means that if properties were to ditch fossil fuels and get their power solely from the UK's electrical grid, the properties would be closer to zero emissions. There are other incentives to decarbonising houses, such as saving money through retrofitting insulation or simply making properties more comfortable to live in. Because the grid will eventually decarbonise, interventions like, domestic solar panels and batteries will have less of a carbon-saving impact over time but they will still reduce homeowners bills for many years to come. Recently, the Climate Change Committee have given full support for electrified heating for homes. There are many ways to electrify heating of homes including air-to-water heat pumps that heat conventional radiators, sourcing heat from air, the ground or even water courses. Air-to-air heat pumps work like air conditioning in reverse, pumping warm air into the property. Direct electric alternatives such as infrared panels or storage heaters can decarbonise homes or flats that are less suitable for heat pumps. Heat batteries can also be used to store cheaper off peak electricity using later to heat radiators. There are plenty of options to suit every home. We have modelled that 90% of buildings will be electrified by 2040. Typical fossil fuel boilers last 10 to 15 years and so if boilers are replaced with electric alternatives at end of life, most of the boilers in Leiston will have been removed by 2040. We have included insulation to enable residents to get the most out of their new heating system.

Leiston's biggest priority within the Built Environment sector should be ensuring as many properties as possible are converted from oil and gas, to electric. This has been accounted for under the "building electrification" intervention. This and other interventions are listed below.

| Intervention | Type | Annual kgCO2 reduction per unit | Number | First install year | Last install year |
|---|---|---|---|---|---|
| Building Electrification | RT | 1500 | 2795 Installs | 2025 | 2040 |
| Domestic insulation retrofit | RT | 1750 | 500 Installs | 2025 | 2030 |
| Wall Insulation | RT | 1600 | 50 Installs | 2028 | 2030 |
| Roof insulation | RT | 1600 | 500 Installs | 2026 | 2035 |
| Window Replacement | RT | 1000 | 50 Installs | 2026 | 2035 |
| Domestic LED Lighting | RT | 200 | 200 Installs | 2026 | 2027 |
| Domestic Solar panels | RT | 1800 | 2000 Installs | 2025 | 2030 |
| Battery Storage | RT | 2000 | 2000 installs | 2025 | 2030 |

*The 'type' column refers to the technology, as found on page 25 reduction (RT), enabling (ET) or sequestration (SE).*

# Land use and agriculture

**Key Land Use Facts for Leiston:**

| Total Forest Land | Approximate Number of Gardens | Total Crop Land |
|---|---|---|
| 110 Hectares | 2500 | 725 Hectares |

If Leiston aimed to achieve Net Zero in line with the UK government targets, then between 2025 and 2050 Leiston would need to see at least a 90% reduction in 'Agriculture' emissions, as well as an increase in sequestration from 'Land Use'. **This would mean Leiston needs to lower their Agriculture $CO_2e$ emissions from 0.53 to 0.05 kilotonnes of $CO_2e$ per year. Increasing sequestration can enable Leiston to achieve Net Zero, locally.** Potential interventions include large landscape-scale action such as rewilding but also smaller scale interventions that individual residents, families and groups can contribute to as well. The scale of actions can seem big, but they are achievable. 100,000 broadleaf trees could use as little as 62.5 hectares of Leiston's 836 hectares of grassland. A single tree in each garden would contribute approximately 2500 trees. This would both sequester carbon and create a community asset.

For the community of Leiston, focusing on interventions that sequester carbon such as tree planting and rewilding will be pivotal to putting the net in Net Zero. If Leiston achieved the measures listed below, it could be possible to go net negative and sequester more carbon than emitted!

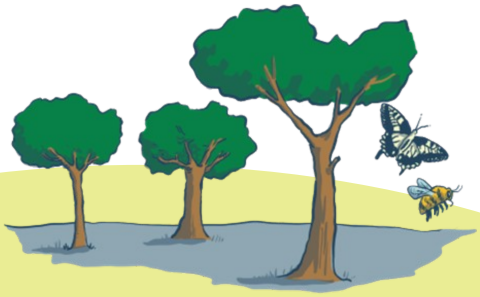
Listed below are several actions that the Leiston community could take that will further aid the transition. The priority actions for Agriculture and Land Use based on the makeup of Leiston listed below:

| Intervention | Type | Annual $kgCO_2$ reduction per unit | Number | First install year | Last install year |
|---|---|---|---|---|---|
| Reduce tillage | SE | 25 | 300 Hectares | 2029 | 2033 |
| Extensive Green roof | SE | -1.28 | 1000 $m^2$ | 2028 | 2032 |
| Tree Planting | SE | -10 | 100000 Trees | 2026 | 2030 |
| Rewilding | SE | -0.52 | 100 Hectares | 2030 | 2040 |

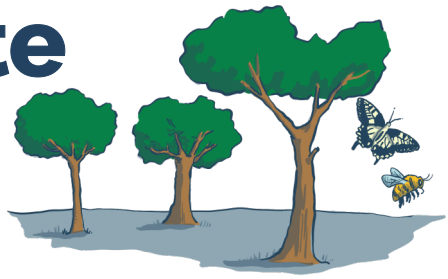
*The 'type' column refers to the technology, as found on page 25 reduction (RT), enabling (ET) or sequestration (SE).*

The actions below could create community assets that support more community engagement with the topics of climate, waste and nature.

| Intervention | Type | Annual $kgCO_2$ reduction per unit | Number | First install year | Last install year |
|---|---|---|---|---|---|
| Local Bee-keeping | ET | 10 | 10 Hives | 2026 | 2028 |
| Community Composting | RT | 200 | 3 Areas | 2025 | 2027 |
| Zero Waste Shop | RT | 200 | 1 shop | 2025 | 2026 |



# Adapting to Climate Change in Leiston



The Net Zero Pathway shows the action needed in Leiston to respond to climate change, **mitigate emissions** and to reach **Net Zero.** Reducing emissions brings multiple benefits to the local community; **lower energy bills**, **cleaner air**, and **healthier lives**. These are all great reasons to pursue Net Zero locally. However, the climate is already changing and when Leiston reaches Net Zero, the climate will have changed even more. Leiston will need to **adapt** to the changes that we can no longer avoid.

As the global average temperature increase rises above **1.5˚C**, the effects are already being felt. **Hotter, wetter, and more extreme** weather is becoming more common, both in the UK and around the world. This means that, alongside cutting emissions, we must also **adapt** to the impacts already underway. But what does climate adaptation look like? What actions are needed? **Globally, nationally, and here in Leiston?**

In April 2025, the Climate Change Committee (CCC) published its **Adaptation Progress Report**. It identified **61 key climate risks** affecting nearly every aspect of life in the UK. More than half of these require **urgent action** within the next five years. **Nature** is under pressure from extreme heat, drought and habitat loss, which reduces biodiversity and weakens natural flood protection. **Farming** faces lower yields, damaged soil and stress on livestock, threatening food supplies.

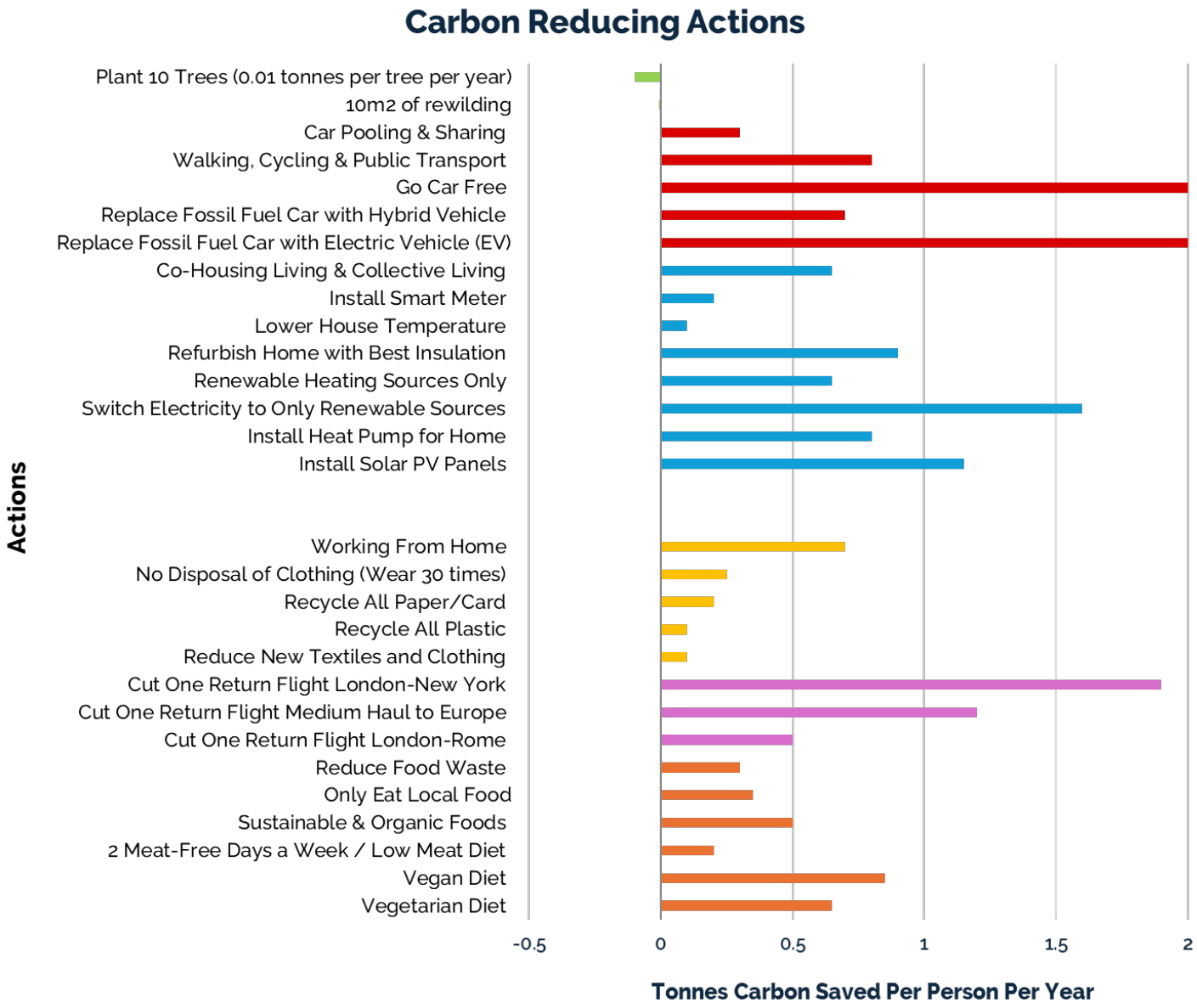
**Infrastructure** such as roads, power lines and water systems can be vulnerable to extreme weather. Many **buildings** overheat in summer or suffer from damp due to heavier rainfall. **Public health** is at risk from heatwaves, new diseases and the mental strain caused by disruption. **Businesses** are affected by storms, supply chain delays and increasing costs. Even **global events**, like food shortages or climate-related migration, can have serious impacts here at home.

How do we cope, now and in the future? We're already learning to manage today's climate extremes: shading windows, insulating homes, installing flood defences, and planting drought-tolerant species. But what about **next year**, or **the next decade**? What will Leiston need to do to adapt to stronger storms, more intense rainfall, and more extreme summer heat? **Is Leiston prepared?**

# Reducing our carbon footprint

## 30 personal behaviour changes

### you could consider implementing to reduce your annual carbon footprint:




**Green = Sequestration / Red = Transport / Blue = Homes /**
**Yellow = Behaviour Change / Pink = Travelling / Orange = Food**

*The data is adapted from key references on carbon by behaviours: Institute for Global Environmental Strategies, Aalto University and D-mat ltd. 2018.*

*www.iges.or.jp/en/pub/15-degrees-lifestyles-2019/en*

# Together we can make a difference

**Leiston has a population of 5800, so if:**

- 20% of Leiston's population *only ate local food,* Leiston could save 347 tonnes of CO2e a year.

- 60% of Leiston's population *recycled all paper and card*, Leiston community could save 696 tonnes of CO2e a year.

**There are approximately 2500 gardens in Leiston, so if everybody in Leiston who had a garden:**

- *Planted one tree:* Leiston could remove 25 tonnes of CO2e of emissions every year.

**There are approximately 3500 buildings in Leiston, so if everybody in Leiston who had a property:**

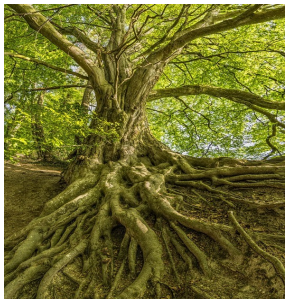
- *Installed a smart meter:* Leiston could reduce its built environment emissions by 702 tonnes of CO2e a year.

## The UN Sustainable Development Goals

The Sustainable Development Goals (SDGs) are a set of 17 global goals established by the United Nations in 2015, aimed at addressing the world's most pressing challenges by 2030. These goals cover a wide range of issues, including poverty, hunger, health, education, clean water, and climate change. Governments, businesses, and individuals can use the SDGs as a guide to make decisions and take actions that contribute to a more sustainable and equitable world. By aligning community polices and practices with these goals, we can work together to create a more sustainable future.

# Rewilding

**Description:** Rewilding is vital in the UK due to its dense population and history of habitat damage. Centuries of farming, cities, and industry have left ecosystems fragmented and lacking diversity. Rewilding embodies large-scale ecosystem restoration, prioritising nature's self-regulating capacity. Ultimately, rewilding allows living systems to sustain ecological functions vital for all, while enabling individuals to reconnect with the wild.



## Government Targets and Policies:

| | |
|---|---|
| **2030** | Protect 30% of UK land |
| **2042** | Create or restore 500,000 hectares of wildlife rich habitat outside of protected areas by 2042 (3.8% of England's land area) |
| **2042** | Restore 75% of our one million hectares of terrestrial and freshwater protected sites to favorable condition, securing their wildlife value for the long term |

| No of m2 of rewilding | Cost per m2 | Cost saving per m2 | CO2 saving per m2 per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| 1,000,000 m² (100 Hectares) | £0.50 | £- | -0.52 | 2030 | 2040 |

## Case Studies:

1 **Wild Ken Hill** project is a groundbreaking rewilding effort led by Rewilding Britain. Situated in Norfolk, this initiative aims to restore nature's harmony by reintroducing native species and revitalising habitats. Through innovative conservation methods and community involvement, Wild Ken Hill is forging a path towards a thriving, wilder landscape.

## Funding Opportunities:

| | |
|---|---|
| **Rewilding Innovation Fund** | Offers up to £15,000 in funding to community-based rewilding projects and those that benefit people's health and wellbeing. |
| **Water Sensitive Farming** | Free advice and capital grants available for the implementation of soil and water focused-solutions |
| **Countryside Stewardship Grant** | A 3-year agreements offering capital items to achieve specific environmental benefits in 4 groups: boundaries, trees and orchards, water quality, air quality, natural flood management |

Before conducting any major rewilding activity you may be required to get a professional wildlife survey. This will check for **invasive** species and assess potential impacts on **protected** species and habitats in the area.

**Idea: Get local residents and businesses to each sponsor 10m2 of rewilding within the community**

# Domestic PV and Heaters

**Description:** Domestic solar photovoltaic (PV) systems are renewable energy solutions designed for residential properties, harnessing the power of sunlight to generate electricity. At the heart of domestic solar PV systems are the solar panels, which are typically installed on rooftops or ground-mounted arrays. Combined with battery storage solutions this technology offers homeowners a comprehensive approach to sustainable energy independence and not only allows households to generate their own clean electricity but also provides resilience against power outages and fluctuations in the grid.

### Government Targets and Policies:

**2030** UK commits to decarbonise the electricity grid system by 95%

| Technology | No of properties with solar installed | Cost per property | Cost saving per property | CO2 saving per property per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|---|
| Solar PV | 2000 | £7,000 | £800 | 1800 | 2025 | 2030 |

### Case Studies

**1** **Fenn Road & Ditton Fields** is the first in a pilot of Passivhaus low-carbon social housing in Cambridge. A local architect has developed designs to build 18 Passivhaus homes that are targeting Net Zero. All properties will be fitted with solar PV arrays ranging in size based on the properties energy demands and will allow each household to operate independently without consuming electricity from the grid.

**2** **Woodlands Edge** is a development of 30 homes just outside of Lincoln City Centre designed with Passivhaus principles in mind. The all-electric homes make use of low carbon technologies including Mechanical Ventilation with Heat Recovery and Solar Panels. Each property is scheduled to be fitted with a 3.68Kwh array providing them with renewable energy, reducing their grid consumption.

### Funding Opportunities:

| | |
|---|---|
| Octopus Energy | Can arrange fixed-term loans available of 3, 5 and 7 years to pay for the cost of installing solar PV and battery storage on domestic properties |
| ECO4 | Is a government energy efficiency scheme designed to tackle fuel poverty to households of low-income families or those with a EPC rating of D or below. The grant can fund the cost of solar PV to be installed. |

Choose a reputable and experienced solar installer. Researching multiple contractors, reading reviews and obtaining multiple quotes can help homeowners select a reliable installer who meets their needs, energy requirements and budget.

Environmental regulations, such as those related to environmental impact assessments or habitat protection, may apply to solar PV installations in certain areas.

# EV Charging

**Description:** In the UK, the rollout of Electric Vehicle (EV) chargers is critical for reducing carbon emissions and promoting the use of electric vehicles. EV chargers don't reduce emissions directly, but can speed up the adoption of EVs in the community. There are three main types: Level 1 chargers (suitable for overnight home charging), Level 2 chargers (offer faster charging and are ideal for homes, workplaces, and public areas) and DC Fast Chargers, (the quickest option, for motorway service stations). Strategically deploying these chargers can accelerate EV adoption, decrease fossil fuel reliance, and cut transportation emissions.

## Government Targets and Policies:

| | |
|---|---|
| **2035** | Ban the sale of new petrol and diesel cars and vans (UK Wide) |

| Charger Type | No of Chargers | Cost per Charger | Cost saving per charger | CO2 saving per charger per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|---|
| Fast | 20 | £5000 | £750 | 1000 | 2025 | 2028 |
| Rapid | 8 | £6000 | £950 | 1200 | 2025 | 2030 |

## Case Studies:

1. **Plug in Suffolk** is designed to improve EV charging in Suffolk The project provides open access community charge points across the county. Installation of the charge point is funded by Plug in Suffolk and the charge point will be maintained for a minimum of 7 years at no cost to the site holder. The host will receive a share of the revenue and is expected to assist in publicising the charge point.

2. **Wattif EV** offers charging options such as fully funded setups, where all costs are covered by Wattif with revenue sharing, joint ventures, and full ownership, where clients handle initial expenses while Wattif manages operations.

## Funding Opportunities:

| | |
|---|---|
| ORCS | UK government funding to local authorities for the installation of EV charge points in residential areas without private parking. |
| LEVI | Scheme to help local authorities across the country develop and their EV charging networks |
| EV Charge Point Grant | Funding of up to 75% towards an EV chargepoint installed at home or you can get £350 off the cost of an EV charger – whichever is lowest. (all subject to eligibility). |

**Street furniture** such as lampposts can contain EV chargers, making EV charging for on-street parking along narrow roads more accessible.

Before installing community EV chargers, **contact UKPN (the distribution Network Operator (DNO) for Leiston)** to ensure there is sufficient electrical grid capacity in the area.

# Subsidised Insulation

**Description:** By utilising funds from government grants or partnering with local businesses and non-profits, councils can offer financial incentives or discounts to homeowners interested in improving their home's energy efficiency. Such initiatives not only help reduce individual carbon footprints but also contribute to broader environmental goals by significantly lowering the community's overall energy consumption and emissions. Moreover, councils can facilitate educational programs to raise awareness about the benefits of insulation and other energy-saving measures, fostering a community-wide commitment to sustainability and environmental responsibility.

### Government Targets and Policies:

**2025** Future Homes and building standards policy released

| Insulation Type | Number of properties | Cost per property | Cost saving per property | CO2 saving per property per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|---|
| Wall Insulation | 50 | £17,500 | £2,000 | 1600 | 2028 | 2030 |
| Roof Insulation | 500 | £2,500 | £800 | 1600 | 2026 | 2035 |

### Case Study:

**Suffolk's** public sector organisations have initiated a program to offer subsidised loft insulation to residents, helping them make their homes warmer and more energy-efficient. This initiative provides residents with a 50% discount on loft insulation purchases, up to a value of £200, with the aim of reducing home heating costs and contributing to the county's carbon emissions reduction goals. The council collaborated with a builders' merchant to ensure the program's reach and effectiveness, supporting Suffolk's broader climate and sustainability targets.

### Funding Opportunities:

**GBIS** Helps residents with Energy Performance Certificate (EPC) ratings from D to G and those living in specific council tax bands to receive financial assistance for various insulation types.

**ECO** The ECO scheme supports energy efficiency measures in the home of those considered to be in fuel poverty.

Establishing clear criteria for which residents are eligible for the subsidy is important. This could be based on income, property type, or existing energy efficiency ratings. Prioritising homes that will benefit most from insulation, such as older properties that are harder to heat, could also be a focus.

# Digi–Go

**Description:** DigiGo is a fully electric minibus service which runs across areas of Essex and offers 'on-demand and pre-bookable travel with no fixed route or timetable'. The service is aimed at residents who have limited access to public transport, or who do not have access to ULEV private vehicles. The scheme utilises an app which allows users to book the journeys up to 7 days in advance, the minibuses can also be tracked in-app. The pilot scheme has been running for two years, and currently operates within two rural and suburban areas.


### Government Targets and Policies:

**2035** Ban the sale of new petrol and diesel cars and vans (UK Wide)

| Number of minibuses | Cost per minibus set up | Cost saving per minibus | CO2 saving per minibus per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| 1 | £50,000 | £25,000 | 8760 | 2026 | 2027 |

### Case Studies:

1. **Cambridge, UK - Electric Taxi.** The city implemented a comprehensive policy in 2018, mandating that all newly licensed taxis must be ultra-low or zero-emission vehicles. This shift was supported by incentives such as license fee exemptions and discounts, extended age limits for EV taxis, and the introduction of a dedicated taxi rapid charging infrastructure.

2. **Coventry - All Electric Buses.** The UK government launched an initiative in 2020 to establish Britain's first all-electric bus city in Coventry. The city received £50 million to transition to a fully electric bus fleet. This transition is part of a larger £170 million funding package intended to make bus journeys greener, easier, and more reliable across the country.

### Funding Opportunities:

**Bus Service Operators Grant (BSOG) Zero Emissions Bus**

Operators of vehicles that hold a zero emission bus certificate may be eligible for a 22p per kilometre rate of BSOG for those vehicles. Eligible buses must:

- Meet the normal BSOG rules
- Demonstrate zero tailpipe emissions
- Have no internal combustion engine

**DigiGo has increased residents access to health, education, and employment opportunities,** with local schools, hospitals and tourist attractions noting DigiGo's usefulness.

**Funded by the UK Department for Transport's Rural Mobility Fund,** DigiGo will run for two years, with learnings and development used to inform potential future rollout to other areas of the UK.

# E-Bike Rental Schemes

**Description:** Rental schemes offer convenient access to electric bicycles or even e-scooters for short-term use, typically ranging from a few hours to a full day. These schemes operate similarly to traditional bike rental services but feature electric bikes equipped with battery-powered motors that provide pedal-assist or full throttle support. Users can rent e-bikes from designated rental stations or through mobile apps, allowing for easy pickup and return.

### Government Targets and Policies:

| | |
|---|---|
| **2030** | Investing £2 billion over five years with the aim that half of all journeys in towns and cities will be cycled or walked |
| **2040** | Deliver a world class cycling and walking network in England |

| Technology | Number of bikes | Cost per bike | Cost saving per bike | CO2 saving per bike kg per year | Year first action taken | Year final action taken |
|---|---|---|---|---|---|---|
| E-Bikes | 18 | £2,000 | £200 | 200 | 2025 | 2026 |

### Case Studies:

**1** **Beryl** introduced a bike and e-scooter share program in spring 2020, offering up to 600 manual and electric-assist bikes for hire in Norwich city centre and the surrounding vicinity. Transport for Norwich selected Beryl through the UK government's Transforming Cities Fund.

**2** **TIER** are the worlds largest shared micro-mobility operator and in July 2023 announced they will launch 100 e-bikes in Colchester to support demand for longer journeys. These e-bikes are being introduced in addition with their fleet of e-scooters.

### Funding Opportunities:

| | |
|---|---|
| **Gear Change** | £175m available from the government available to local councils for projects |

Two types of Rental Schemes: **Docked** cycle share schemes involve users picking up and returning bicycles at specific stations, ensuring regulated access. **Dockless** schemes, on the other hand, offer flexibility, allowing users to locate and unlock bikes via smartphone apps, but require responsible parking to avoid cluttering public areas.

# Tree Planting

**Description:** Tree planting is crucial for the UK to enhance biodiversity, mitigate climate change, and create healthier, more resilient communities. Tree planting involves strategically placing saplings or seeds to establish forests or enhance green spaces. It benefits communities by improving air quality, providing habitat for wildlife, and enhancing aesthetics. Environmentally, it contributes to carbon sequestration, soil stability, and water management. Overall, tree planting promotes community well-being and environmental sustainability.

### Government Targets and Policies:

**2025** Plant 1,000 hectares of trees annually

**2025** Establish 10 new 'Tree Cities of the World' accredited communities

| Number of trees | Cost per tree | Cost saving per tree | CO2 saving per tree per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| 100,000 | £1 | £60 | -10 | 2026 | 2030 |

### Case Studies:

1. **Norfolk Rivers Trust's River Wensum Project** was a tree planting project along the River Wensum to improve water quality, reduce flood risk, and enhance biodiversity. By engaging local communities and landowners, they planted native trees along riverbanks and floodplains, creating a natural buffer to filter pollutants and provide habitat for wildlife.

2. **Norfolk Woodland Trust's Community Woodland Initiative** was established in partnership with local residents, schools, and businesses. One project was the Holt Lowes Community Woodland. This involved planting thousands of native trees to restore degraded habitats and create recreational spaces for the public.

### Funding Opportunities:

**Woodland Creation Grant (WCG)** Managed by the Forestry Commission, the WCG provides funding to landowners, farmers, and community groups in **Norfolk** for establishing new woodlands.

**Community Forest Fund** Administered by the Woodland Trust, offers financial support to local communities in **Norfolk** interested in establishing community forests or woodland projects.

Planting **native trees** helps preserve biodiversity, supports local ecosystems, and enhances the resilience of landscapes to climate change and pests. By choosing species adapted to the region's soil, climate, and wildlife, communities can ensure the long-term success and sustainability of their tree planting efforts.

# Building electrification example;

# Domestic Air Source Heat Pump

**Description:** A domestic air source heat pump is a very energy-efficient and low carbon heating and cooling system designed for residential use and is one of the many options available for home electrification. It works by extracting heat from the outside air, and transferring it into your home during the heating season. During the cooling season, the process is reversed, with the heat pump removing heat from inside your home and transferring it outside. One of they key benefits of air source heat pumps is their energy efficiency. They can provide heating and cooling by using significantly less electricity compared to traditional heating systems and can be over 300% or even 400% efficient.

## Government Targets and Policies:

**2050** The UK is committed to reaching Net Zero by 2050. This means that the total greenhouse gas emissions would be equal to the emissions removed from the atmosphere, with the aim of limiting global warming.

| Number of Heat Pumps | Cost per heat pump | Cost saving per heat | CO2 saving per heat pump | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| ~2000 | £5000 | £200 | 1400 | 2025 | 2040 |

## Case Studies:

**1** **Miller Installations** completed an installation of a domestic ASHP in a 1930's built house that was fitted with a very inefficient boiler and inadequate radiators. A '*NIBE 16kw* F2040' air source heat pump unit was installed, along with new compatible radiators to enable the customer to have reduced running costs and a house that is always able to be kept warm and comfortable.

**2** **R A Brown Heating Services** installed a twin cascade ASHP system in a 200 year old period home in poor repair with an old oil heating system as part of a renovation. With the updated ASHP system, the property is making an annual saving of 12,833kgCO2.

## Funding Opportunities:

**Boiler Upgrade Scheme** The boiler upgrade scheme (BUS) provides a grant to encourage property owners to replace existing fossil fuel heating with more efficient, low carbon heating systems like ASHPs. Households can receive up to £7500 funding towards the purchase and installation.

Before installing an ASHP, check local building codes and regulations to ensure compliance with permitting requirements. Some areas may have specific regulations governing the installation of HVAC equipment, including setback requirements, noise restrictions, and zoning ordinances.

# Zero Waste Shop

## Description:

A zero waste shop, is a retail establishment that promotes sustainable living by offering products that generate little to no waste throughout their lifecycle. These shops provide opportunities to purchase package-free goods and support local businesses committed to environmental responsibility. Many zero waste shops will source products from local producers to reduce carbon emissions associated with transportation.


## Government Targets and Policies:

**2035** The amount of municipal waste landfilled is reduced to 10% or less of the total amount of municipal waste generated (by weight).

| Number of zero waste shops | Cost per zero waste shop | Cost saving per zero | CO2 saving per shop per | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| 1 | £30,000 | £100 | 200 | 2025 | 2026 |

## Case Studies:

1. **Ernie's Zero Waste Shop** based in Norwich sell a wide variety of unpackaged food, cleaning refills as well as a range of personal care items. Offering click and collect, local deliveries using cargo bikes as well as UK wide deliveries. The shop also acts as a hub for the local community.

2. **Scrap-Box** is a re-use Scrapstore located in Reepham, Norfolk who collect, process and sell a wide variety of clean, waste materials, mainly donated by local commercial companies which can then be re-used in the community by schools and playgroups, art, drama, and music workshops, clubs and individuals for creative art and craft purposes.

Choose a strategic location with a high footfall of potential customers and that can be easily accessible to your local community. Consider parking, accessibility and proximity to suppliers and familiarise yourself with local regulations and requirements for operating a retail business selling produce.

# Building electrification example; Domestic GSHP

**Description:** Similar to air source, a ground source heat pump, is an energy efficient heating and cooling system that harnesses the relatively constant temperature of the ground to provide heating, cooling and hot water for residential and commercial buildings. GSHP's provide year-round comfort, while reducing energy consumption and environmental impact and are well suited to larger dwellings with high-heat demand and available space for the ground source loop or borehole.

### Government Targets and Policies:

**2050** The UK is committed to reaching Net Zero by 2050. This means that the total greenhouse gas emissions would be equal to the emissions removed from the atmosphere, with the aim of limiting global warming.

| Number of GSHPs | Cost per GSHP | Cost saving per GSHP | CO2 saving per GSHPs per year (kg) | Year first action taken | Year final action taken |
|---|---|---|---|---|---|
| 50 | £15,000 | £750 | 2000 | 2025 | 2040 |

### Case Studies:

**1** **Miller Installations** supported a customer install a GSHP at their 4 bed home in Tunstead as part of a renovation. A NIBE 12kw 1245 GSHP and upgraded radiators were installed, and the customer has seen a dramatic reduction in their heating and cooling costs.

**2** **R A Brown Heating Services** completed a GSHP replacement for a customer which reduced their CO2 output by 9187 kg per year. It is saving them money on running costs whilst also operating their heating in a more energy efficient way.

### Funding Opportunities:

**Boiler Upgrade Scheme (BUS)** The boiler upgrade scheme provides a grant to encourage property owners to replace existing fossil fuel heating with more efficient, low carbon heating systems like GSHP. Households can receive up to £7500 funding towards the purchase and installation.

Check local building codes, zoning regulations, and permitting requirements for GSHP installation. Some areas may have specific regulations governing geothermal system installation, including setback requirements, environmental permits or inspection procedures.

# Assumptions for calculations

## Carbon Budgets

Community carbon budgets are derived from data created by the Tyndall Carbon Budget Tool. The tool was developed by researches at Tyndall Manchester to present climate change targets for UK local authority areas that are based on commitments in the UN Paris Agreement. These are informed by the latest science on climate change and defined by science based carbon budget setting.

## Carbon Emissions from Intervetions

CO2 savings of interventions are estimated based on research into the best available data (supported by the use of artificial intelligence) comparing a 2024 business as usual situation with emissions reductions following installation of carbon reduction interventions. Savings will vary across the years following installation due to the application of decarbonisation factors, derived from the UK Committee on Climate Change's Balanced Net Zero Pathway in version 2 of the Sixth Carbon Budget dataset.

## Cost of CO2 Actions

Data applied to estimate the cost of CO2 abatement (measured in pounds per tonne of carbon saved) has also been derived from the UK Committee on Climate Change's Balanced Net Zero Pathway in version 2 of the Sixth Carbon Budget dataset. An average cost per tonne of CO2 abated has been applied across the lifetime of each intervention, by applying data from the most appropriate sub-sector available. Installation costs have been researched using available public data and are based on an assumption that the installation is made in 2024.

## Electric Vehicle Uptake

All interventions are assumed to be installed at a steady rate between the first and final intervention dates. Future uptake of electric vehicles (EVs) across the community to replace petrol and diesel powered vehicles, has been assumed to progress in line with the Distribution Future Energy Scenarios 2023, produced by UK Power Networks. Interventions that enable EV use, such as charging stations, have been assumed to contribute a nominal carbon reduction on the basis of encouraging a faster than anticipated uptake of EVs.

## Converting between Kg, T and kT

To convert between these units: from kilograms (kg) to tonnes (T), divide by 1,000; from tonnes to kilotonnes (kT), divide by 1,000 again. Conversely, to convert from kT to T, multiply by 1,000, and from T to kg, multiply by 1,000.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