

A Net Zero Pathway



for Thetford

Building Tomorrow.

Together.

Today.

Opergy Net Zero



Opergy
Net Zero

Published: September 2024

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Thetford: A Summary

1 The Journey so Far

Thetford
Area Action
Plan

Green
Infrastructure

Breckland
Sustainability
Strategy

Community
Grants

3 Carbon Budgets

A carbon budget refers to the total amount of GHG emissions that can be released into the atmosphere between now and 2100, by an area, while still keeping global temperature rise below a certain threshold.

Thetford's Carbon Budget is **571** kilo tonnes. Should Thetford continue emitting at the same rate, of 78.07 ktCO₂e per year, **Thetford would use up their carbon budget by the end of 2030.**

Working with Thetford

"Having footpaths that are litter free and have better lighting will encourage people to walk more instead of driving"

"I'm worried about climate change and spend a lot of time doom-soothing"

Residents would like...

"I would like to see more eco-friendly means of transport available"

"I think making schools more sustainable would be a good community project"

"More accessible information about how I can help"

"More EV chargers at shops and parking locations"

6 Priority Community Actions for Thetford

Transport:

1. E-Bike Rental Scheme
2. EV-Chargers
3. EV Buses
4. Digi-Go
5. Charge Fairy

Built Environment:

1. Air Source Heat Pumps
2. Smart Thermostats

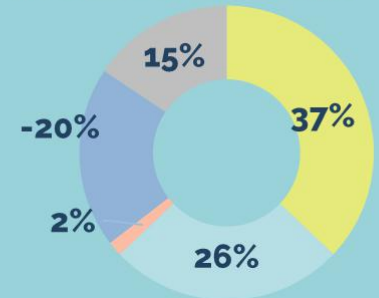
Land:

1. Tree Planting
2. Rewilding
3. Planting Hedgerows

Industrial

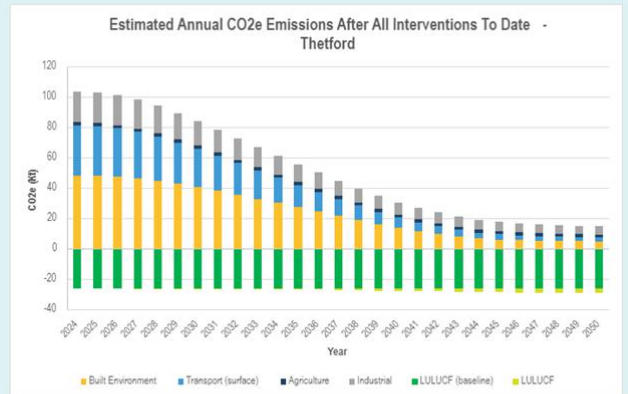
1. Fuel Switching
2. Efficiencies

Thetford's Emissions



Built Environment	: 48.06 ktCO ₂ e per year
Transport	33.4 ktCO ₂ e per year
Land Use	-25.74 ktCO ₂ e per year
Agriculture	2.11 ktCO ₂ e per year
Industrial	20.2 ktCO ₂ e per year

Working towards Net Zero



The figure above represents one potential pathway for Thetford, taking into account UK wide decarbonisation, consumer changes, Thetford's unique characteristics, and community feedback. The pathway sees an almost 90% reduction in CO₂e from 2024 to 2050, however due to Thetford's urban nature, Thetford may wish to consider more proactive innovative ways to sequester/remove remaining emissions, for example through partnerships with surrounding farmers and landowners

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 Thetford, its businesses, schools and its residents for their invaluable engagement and support throughout this process. Our aim, thanks to funding from Norfolk County Council's 'Norfolk Investment Framework', has been to use our knowledge to support you in designing a pathway towards net zero. Thetford's enthusiasm, insights, and commitment have been instrumental in shaping a comprehensive and forward-thinking plan. We sincerely hope that this document further supports your community's efforts 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 three of our key team members involved with this project:

Amelia Fuller is a Consultant at Opergy Group 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 for our local landscape and its communities grew. **Amelia is passionate about helping Norfolk to tackle climate change effectively and creating solutions to this challenge that work for the people and places she cares about.**

Johnathan Reynolds is the co-founder and Chief Executive Officer of the Opergy Group. Norfolk born and educated, he has spent the past 20 years in leadership roles with significant influence over the transition to clean energy technologies, in the East of England and beyond. **He was a key architect of the UK's first, fully engineered, community-level guide for residents and businesses on how to reach net zero,** produced for town of Leiston, Suffolk in 2021 – a project that formed the blueprint for the net zero route map you are about to read.

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.

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 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 (CO₂),
2. Methane (CH₄)
3. Nitrous oxide (N₂O)
4. Water Vapour (H₂O)
5. Hydrofluorocarbons (HFCs)
6. Perfluorocarbons (PFCs)
7. Sulphur hexafluoride (SF₆)

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 (CO₂e).

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

1. CO₂ emissions
2. NO₂ emissions (converted to CO₂e)
3. CH₄ 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

64%

2035

78%

2050

100%

Energy Transition

The UK is phasing out unabated coal-fired power generation by 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).

2035 Grid Decarbonisation

The UK government has set a target of 2035 to have an electricity grid that is Net Zero. 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 by 2025 (including no new builds are to be connected to the gas grids). The Green Homes 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.



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

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

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

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 Britain

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.

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



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 nations 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.

We hope to 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 net zero through this document.

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. Furthermore, to ensure the replicability of the methodology, such that other communities could engage with the process, communities of between 5000 – 12,000 residents were selected.

To successfully achieve a community net zero transition it is crucial to comprehend and embrace the unique characteristics of your community itself. Recognising the importance of understanding Thetford 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**



Norfolk's Commitment

Norfolk County Council has set a target to achieve net zero carbon emissions for its own operations by 2030. This includes making council buildings and streetlights more energy-efficient, shifting to electric vehicles for their fleet, and encouraging sustainable practices among employees at Norfolk County Council). Norfolk as an area has aligned itself with the UK wide target of Net Zero 2050.

In 2023 Norfolk County Council received the second highest county score (51%) in the UK by the Climate Action Scorecards. Their highest performance was in collaboration and engagement, achieving an 83% score, highlighting effective stakeholder involvement. Specific strengths included supporting biodiversity and community-based renewable energy initiatives.

Breckland's Commitment

Breckland District Council has set a target to achieve Net Zero carbon emissions by 2035 for its own operations, alongside a target of 2050 for the areas as a whole. This aligns Breckland with the wider UK's current 2050 Net Zero Target.

Thetford: An Overview

Thetford, in Norfolk's Breckland district is situated on the River Little Ouse. Thetford's history dates back to Roman times as the important settlement "Venta Icenorum." Today, it's celebrated for its medieval streets, historic significance as Thomas Paine's birthplace, for his role in both the American and French Revolutions. Alongside its cultural heritage, Thetford boasts scenic parks and nature reserves, attracting outdoor enthusiasts.



Population

As per the 2021 census data,
total population is:

25,492

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



4,046

Over 65s



Under 16

As per the 2021 census data,
the population Under 16 is:

5,758



Key

Listed

Buildings

Nunnery Cottages

Castle Street

Old Market Street

Grove Lane

Thomas Paine Hotel

Property Type	Number
Detached	4,475
Semi Detached	1,821
Terraced	3,824
Other	873
Total	10,993



Community Groups

Thetford Environmental Group:

Regularly meet up to discuss the environment as well as going to national environmental Initiatives. They also frequently post advice for being more sustainable on their Facebook group!

Friends of Thetford Station: A volunteer group working to re-generate the green space at Thetford Railway Station. On the 11th of May they discovered a baby robin and baby swift nest!



Key
Roads

Thetford's vital roads like the **A11** to Norwich/London, **A134** to Bury St. Edmunds/King's Lynn, and **A1066** to Diss/ Norfolk-Suffolk border ensure smooth connectivity, facilitating travel and trade within and beyond the town.

Did You Know:

Thetford boasts the largest man-made lowland forest in Britain, known as Thetford Forest Park!

Thetford's Net Zero Journey

By embracing the objective of net zero, Thetford can actively contribute to global climate action while simultaneously reaping local benefits such as, to protecting the town's character and promoting sustainable development through its Neighbourhood Plan and Environmental Policy.

By adopting net zero as a guiding principle, the community of Thetford can:

- Mitigate climate change through significantly reducing GHG emissions,
- Foster innovation and economic growth via the pursuit of net zero creates opportunities for innovation, clean technology development, and the growth of green industries.
- Enhance community well-being by improving air quality, reduce noise pollution, and contribute to the overall health and well-being of Thetford's residents.
- Preserve natural resources by promoting sustainable land use, protecting natural habitats, and preserving biodiversity.
- Lead the way in adopting sustainable practices and demonstrating the feasibility of achieving net zero.

In 2019/2020 Breckland council approved to carry out a baselining exercise to understand its major emission sources. Since then, data has continued to be collected and shared each financial year to monitor and track progress. Their latest report and presentation (PDF) provides an update on the organisations progress towards achieving a net zero position by 2035.

Thetford Area Action Plan (TAAP)

The Thetford Area Action Plan (TAAP) was formally adopted by Breckland Council on 5 July 2012 following the Planning Inspectorate's finding that the Plan was sound and legally compliant.

Shift from single occupancy car journeys to other forms of movement:

The delivery of a safe, convenient and direct walking and cycling network;

The establishment and operation of a Smarter Travel Thetford Team to promote, deliver and monitor modal shift;

The implementation of priority measures for pedestrians, cycles and buses within the highway network;

The introduction of technology within new and existing residential and commercial development to increase awareness of public transport;

Enhancements to the frequency, routing and facilities for local bus provision within Thetford;

Enhancements to bus services to and from nearby settlements such as Attleborough, Bury St. Edmunds and Brandon; and

Excellent integration between all modes of transport

Sustainability Strategy and Funding

Breckland Council have created the following new work programme by releasing £525,000 of funding to support strategy's around: tree planting, EV charging, environmental projects, switch and save scheme, feasibility studies and street-lights



Creating a Pathway



1

Community Emissions Baseline

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



Engaging with Thetford's town council to secure buy-in and start to understand what the community wants, its barriers to reaching net zero and, potential projects for the area.

Phase 1 Town Council

2

3

Phase 2 Local Champions

Talk to local champions around Thetford's Net Zero Journey . This included, local business owners, community project leaders, educational leaders volunteers and key members of the community.



Talk to the local community around their views on Net Zero, what they would like to see happen in their community, and if they feel that Net Zero should be a priority.

Phase 3 Community Engagement

4

5

Carbon Reduction Modelling

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



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

Pathway Creation

6

Common Questions on Net Zero

Throughout the engagement process several questions continually came up regarding net zero, climate change and sustainability.

Below are questions and answers to some of these key questions:

Is Climate Change real and accelerated by humans?

Yes, climate change is real and occurs naturally, but is being accelerated by human activities. 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 will not make a massive difference individually, but collectively if everyone or all communities make changes this can make a significant impact on tackling climate change. Individual choices, such as reducing energy consumption, using public transport, and adopting a plant-based diet, collectively reduce greenhouse gas emissions all help to reduce bills and spending as well as reducing emissions!

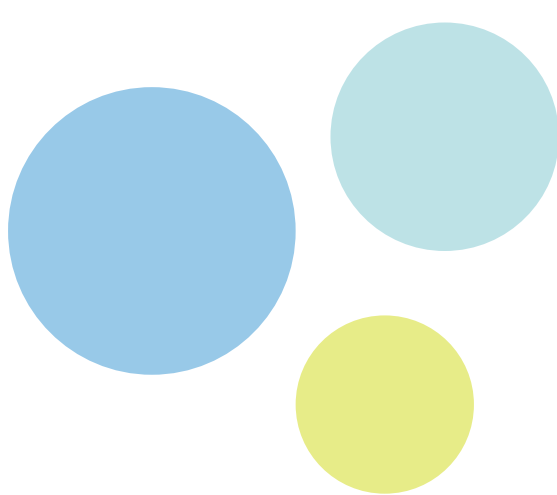
Communities can amplify these efforts by implementing local renewable energy projects, promoting recycling, and advocating for sustainable policies. Grassroots movements have historically driven substantial environmental changes, demonstrating the power of collective action. Moreover, influencing others 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 significantly outweighed by 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 from health related impacts (extreme cold winters or extreme heat summers)



Thetford's Carbon Emissions





Land Emissions

The term "land use" refers to the way humans 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, reforestation, 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 (CO₂) from the atmosphere, acting as a sink, or release CO₂ into the atmosphere, acting as a source. Forests, for instance, absorb CO₂ 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, contributing to greenhouse gas emissions.

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

	LULUCF	Agriculture	Cropland	Forest land
UK	3659.3	46,916.0	15,052.4	-17,083.1
Norfolk	1077.4	1194.7	1117.5	-376.1
Breckland	90.3	320.2	141.6	-131.3

Land use activities not only have implications for climate change mitigation but also for 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.

Methodology

The land emissions 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 CO ₂ e emissions (kt CO ₂ per year)
Forest Land	2344.1	-25.8
Crop Land	982.5	0.09
Grassland	175.6	-0.03
Settlements	804.2	0.00
Wetland	18.0	0.00

Results

The total carbon emissions for Thetford's 'land' is -25.74 tCO₂ per year, the largest proportion of that being attributed to Broad-Leaved or Coniferous Woodland at -25.8 ktCO₂ per year,

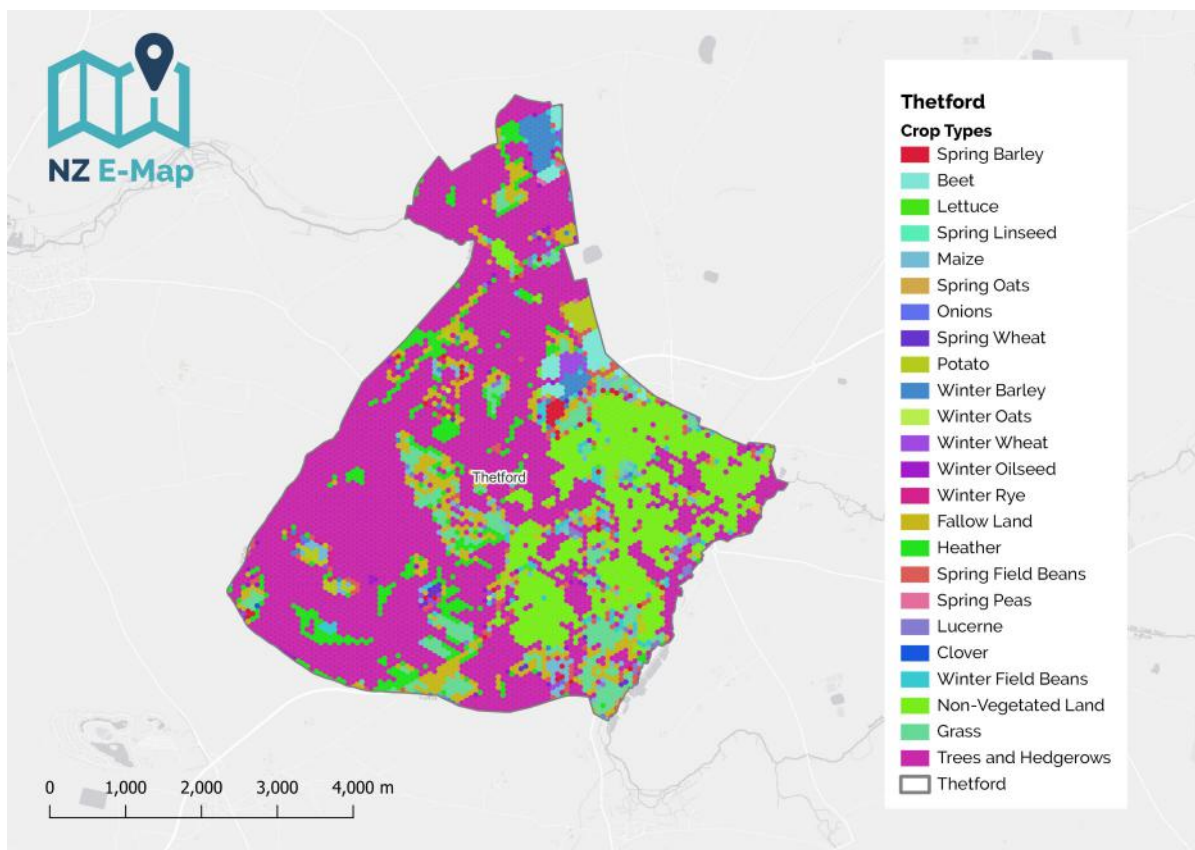




2. Agriculture

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

Total Crop Hectares	Total Nitrogen Application	Total CO ₂ e (Kt CO ₂ e yr-1)
1838	184362	0.811



A crop map for Thetford. The data was taken from the Crop Map of England (CROME) dataset (2020) and provides detailed information about land use and cover, including the different types of crops.

Results

The total carbon emissions for Thetford's 'agriculture' is 0.811 ktCO₂ yr⁻¹. The largest proportion of that being attributed to 'Winter Wheat', excluding forestry and non-vegetated land.

3. Livestock

To calculate the methane emissions from agriculture within the boundary, the use the NAEI data set was used.

Methane Sum (kg)	Global Warming Potential of Methane compared to CO ₂	Total ktCO ₂ e
160	81.2	1.3

Results

The total carbon emissions for Thetford's 'livestock' is 1.3 ktCO₂ yr⁻¹.

Transport Emissions

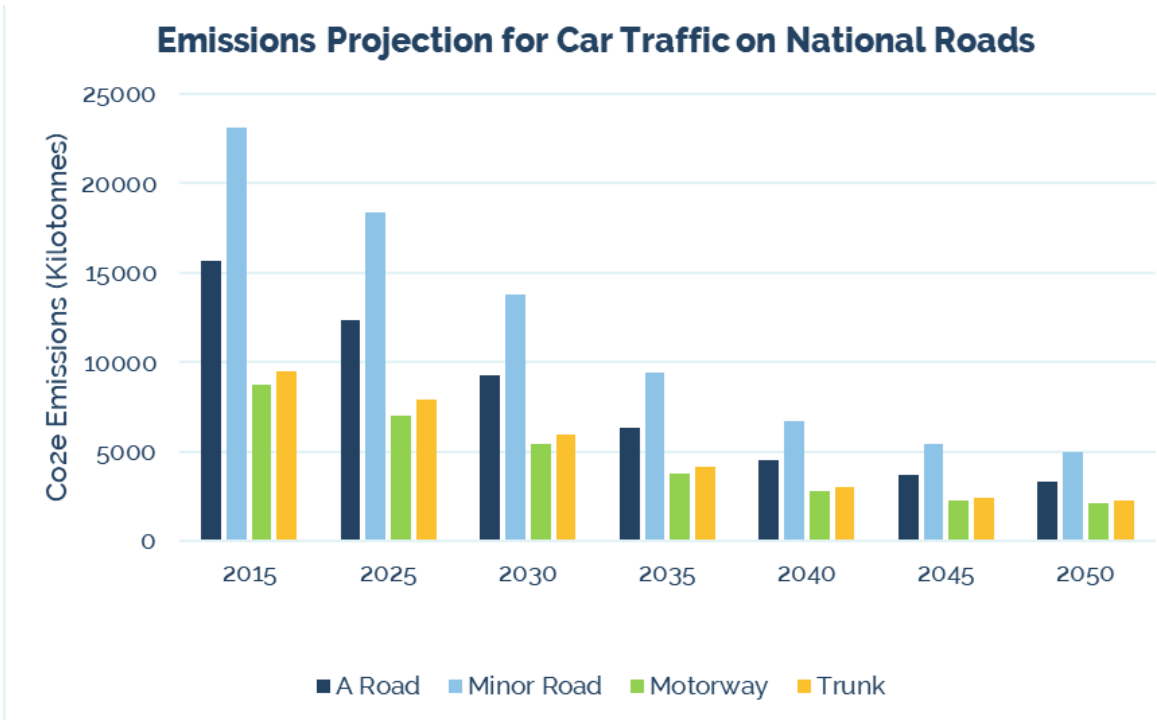
Transportation encompasses various modes, including road, rail, air, and maritime, all of which must undergo significant transformation to align with Net Zero objectives. The sector faces unique challenges due to its heavy reliance on fossil fuels, primarily petroleum-based fuels, and the resulting emissions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

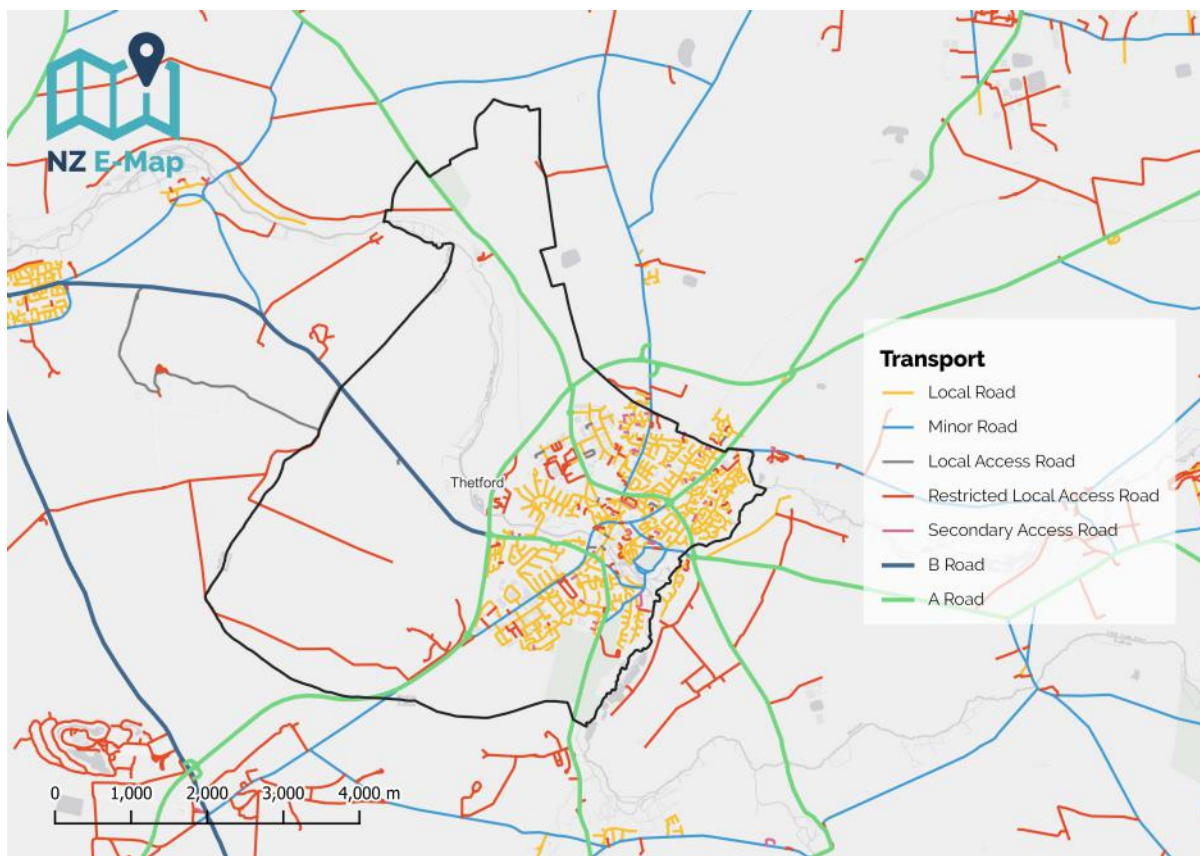
It is crucial to have access to accurate and reliable traffic projections in order to understand local emissions associated with road transport and identify appropriate transport related decarbonisation efforts. These projections serve as valuable data points that inform sustainable transportation solutions,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

	Transport total emissions (tonnes Co2e)	Number of EV charging devices
UK	106,671.4	43,626
Norfolk	1581.7	419
Breckland	346.8	84

The 2022 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.

The graph below highlights CO2e projections of all vehicle types in Eastern England out to 2050:





A road map for Thetford. 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. The road data was taken from the Ordnance Survey website.

The total distance for A, B, Minor and Local roads were analysed alongside the total vehicle counts for the most recent year available. This helped produce the table below which shows the total kilotons of CO₂e each road type and vehicle type produce within Thetford.

	Motorbike ktCO ₂ /yr	Car ktCO ₂ /yr	Bus ktCO ₂ /yr	LGV ktCO ₂ /yr	HGV ktCO ₂ /yr	Total ktCO ₂ /yr
A Roads	0.19	38.58	0.82	10.58	13.50	63.67
B Roads	0.06	5.77	0.63	0.89	0.19	7.54
Minor Roads	0.06	10.45	1.20	1.58	0.32	13.62
Local Roads	0.08	18.09	0.2	0.00	0.00	18.37

Within Thetford there are a total of **103.21 ktCO₂ 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. Moreover, funding of £1.425 billion has been raised for Public Sector Decarbonisation to reduce 75% of emissions coming from public sector buildings by 2037.

Most of the buildings in Norfolk and Breckland are pre 1900 with another major built period between 1965-1990. One of the key objectives of the Neighbourhood Plan is that new developments will be expected to respect and enhance the setting of the listed buildings, preserve the character and appearance of the town whilst enhancing the green infrastructure with biodiversity gain and linkages between existing habitats.

Methodology

1. Domestic Buildings

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

	Detached	Semi Detached	End-Terraced	Mid-Terrace
Total Number of Houses	1590	1554	1212	2162
Average CO ₂ per building (tonnes per annum)	4.27	3.35	3.42	3.04
Total CO₂	6685.7	5206.9	4101.8	6562

There are a total of 6518 properties with EPC ratings within Thetford, producing a total of 22,557 tonnes of CO₂ per annum.

2. Non-Domestic Buildings

Any key non-domestic buildings which have an energy certificate are listed below:

Name	Fuel Type	CO ₂ from Electricity (Tonnes)	CO ₂ from Heating (Tonnes)	CO ₂ from Re-newables (Tonnes)
Croxton Road	Natural Gas	124	12	0
St Martins Way	Natural Gas	30	46	0
St Nicholas Street	Grid Supplied Electricity	98	71	0
Unit 9, Napier Place	Natural Gas	5	0	0
Total (CO₂ tonnes)		257	129	0

There are a total of 4 properties highlighted to be key non-domestic properties, producing a total of 368 tonnes of CO₂ per annum



Sectors	Grid Supplied Electricity	Natural Gas	LPG	Other	Total (Tonnes CO ₂)
COMMUNITY - EDUCATIONAL	85.52				85.52
COMMUNITY - INSTITUTIONAL & COMMUNIAL ACCOMODATION		156.78			156.78
GENERAL COMMERCIAL - MIXED USE		63.34			63.34
INDUSTRY—MANUFACTURING AND PROCESSING	701.57	1145.45	97.79	146.38	2091.19
OFFICE ONLY	305.81	49.94			355.75
RECREATION & LEISURE	64.70				64.70
RESIDENTIAL ONLY	260.07	100.08			360.15
RETAIL ONLY	894.15	305.25			1199.4
UNCLASSIFIED	1678.23	1407.73		38.23	3124.19
Grand Total	3990.05	3228.57	97.79	184.61	7501.02

In total there are a further 103 non-domestic buildings that create 7501 tonnes of CO₂ per year in Thetford.

3. Benchmarking

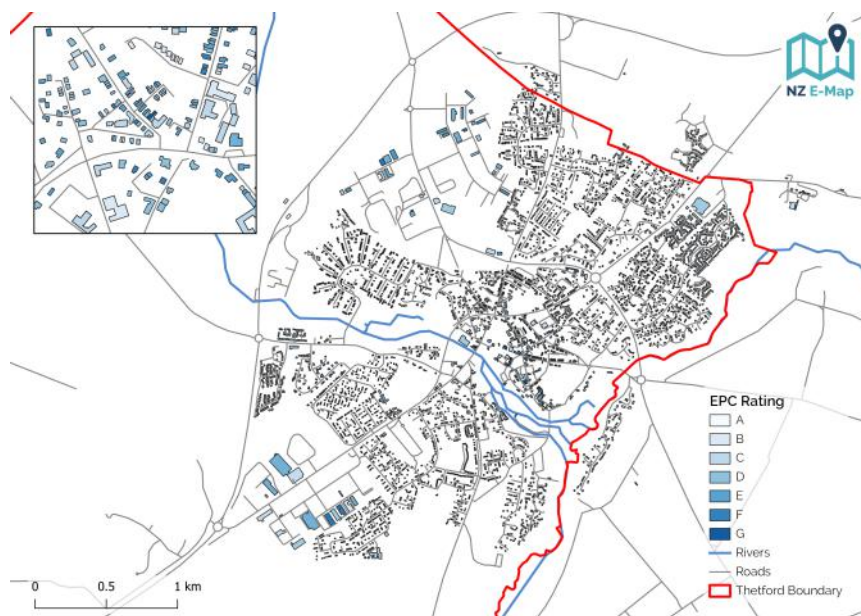
Using the average CO₂ emissions from the domestic and non-domestic building types the bench marking results for buildings are displayed below:

	Detached	Semi Detached	Terraced	Flat/ Maisonette	Other
Total number of properties	2841	267	450	257	553
Average CO ₂ per building (tonnes per annum)	4.27	3.35	3.42	3.04	4.27
Total CO₂	12131.1	894.45	1539.00	781.10	2275.00

There are a total of 4368 properties with no EPC ratings within Thetford.

In total the benchmarking results indicate a further 17,620 tonnes of CO₂ emissions per year across Thetford's built environment.

'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.

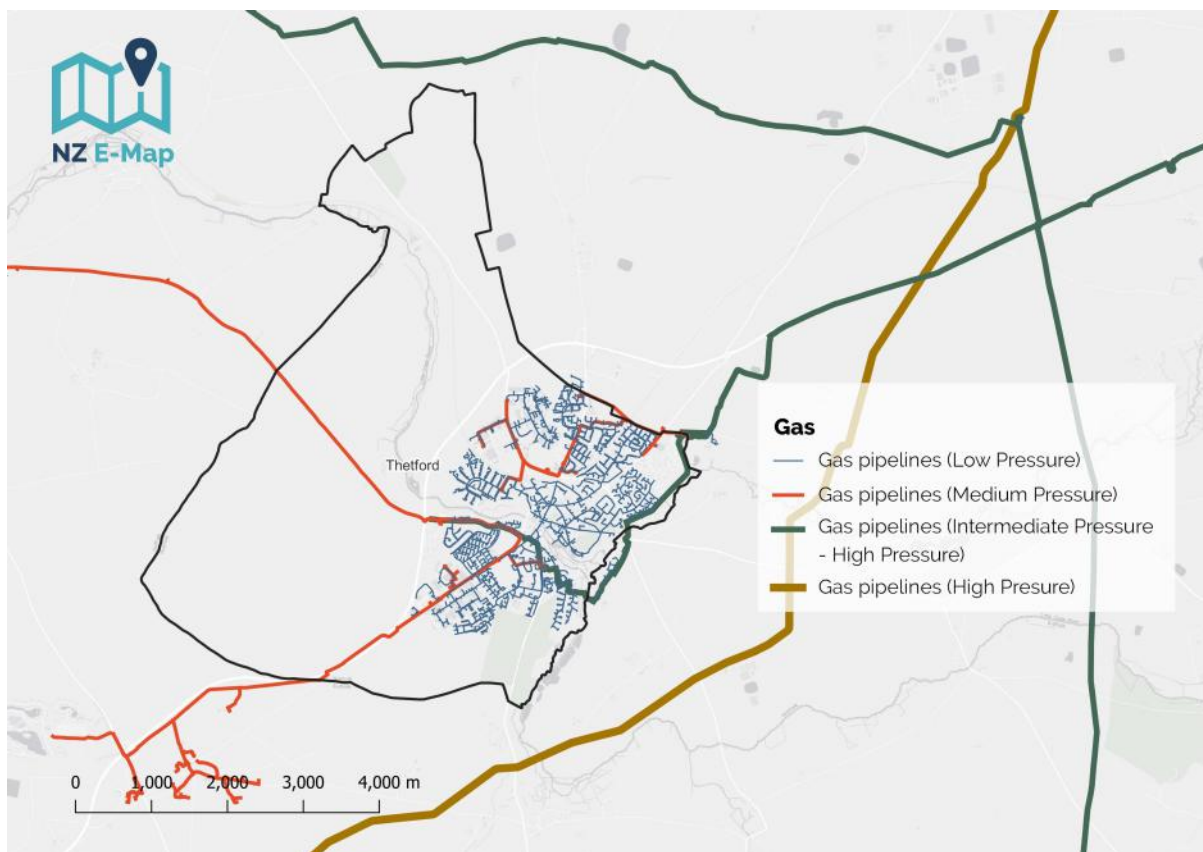


Energy Emissions

The UK Government's strategy for Net Zero aims to reduce greenhouse gas emissions and put an end to the nation's contribution to climate change, reaching net zero by 2050. Although the strategy is a long-term plan, it will be delivered in phases with potentially 6 five-year long carbon budgets. The government has set out proposals to fully decarbonise the power system by 2035 through British renewables, nuclear power stations, flexibility of storage, gas with carbon capture and storage (CCS) and hydrogen for a guaranteed reliable flow of power. Faced with the gas crisis, it has become critical to reduce dependence on fossil fuels and generate alternatives as well as supporting green jobs and infrastructure.

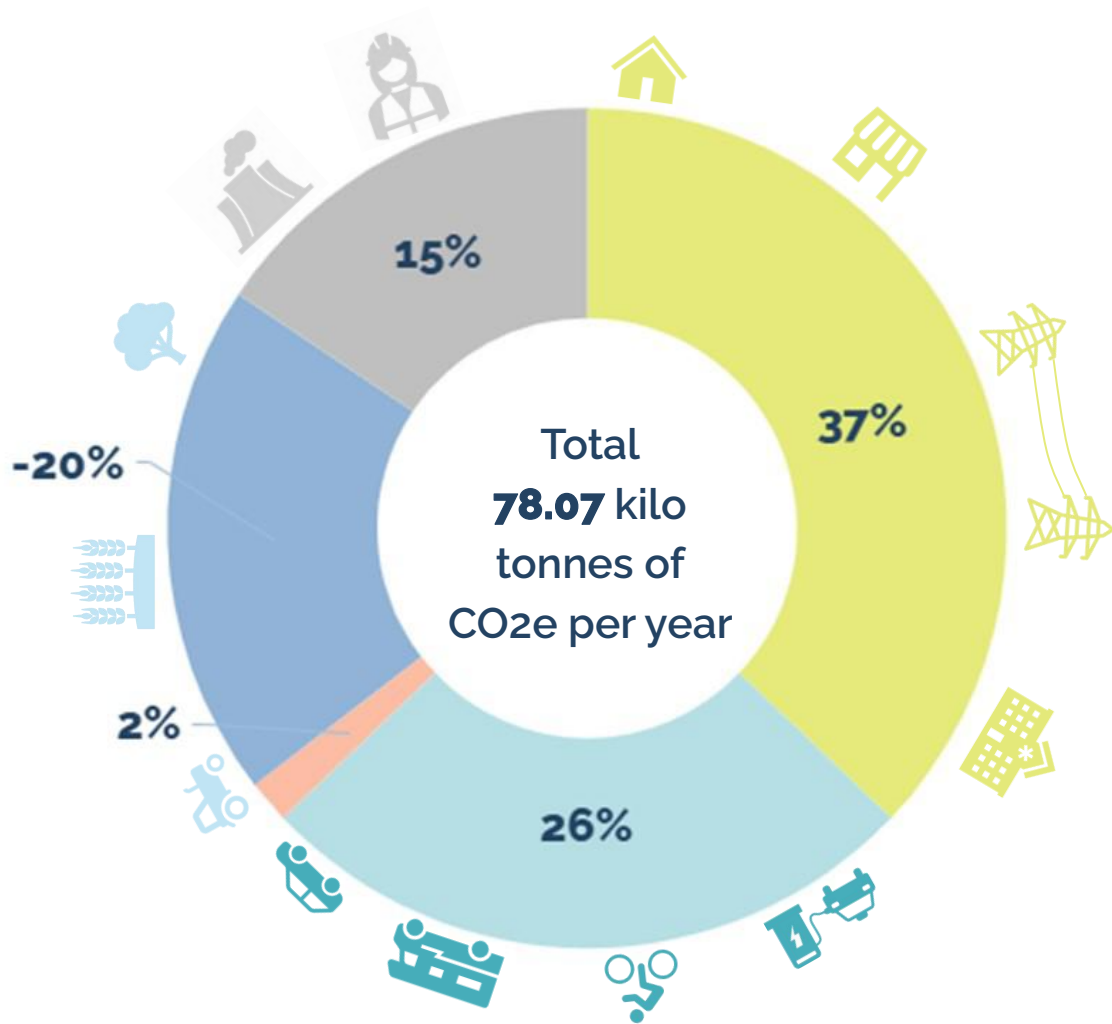
The Norfolk County Council (NCC) seeks to achieve net zero carbon emissions by 2030 on its estate as well as wider areas. The council has set ambitious short-term targets such as achieving 66% emissions reduction by 2024/25 in comparison to its 2016/17 baseline and 85% reduction by 2028/29, relative to the same baseline. NCC's scope 3 emissions are approximately fifty times more than the actual estate's emissions, equivalent to about 7% of the county-wide carbon footprint.

Thetford Council's Energy Group provides support to residents in reducing their oil, gas, coal and electricity consumption and work towards carbon neutrality by 2030. The residents are being offered household heat loss surveys that use an infra-red imaging camera and energy saving tips.



An electrical grid map for Thetford. The electrical grid map helps identify the location and distribution of power generation sources. Understanding the distribution network and infrastructure of the region can help with planning future energy policy and planning for renewable asset introductions.

Thetford's Emissions



Built Environment

The total CO₂e emissions for Thetford's Built Environment is: **48.06 ktCO₂e per year**



Transport

The total CO₂e emissions for Thetford's Transport is: **33.4 ktCO₂e per year**



Land Use

The total CO₂e emissions for Thetford's Land is: **-25.7 ktCO₂e per year** ("sequestered" or "absorbed")



Agriculture

The total CO₂e emissions for Thetford's Agriculture is: **2.11 ktCO₂e per year**



Industry

The total CO₂e emissions for Thetford's Industry is: **20.2 ktCO₂e per year**

Thetford's Carbon Budget

Carbon Budgets

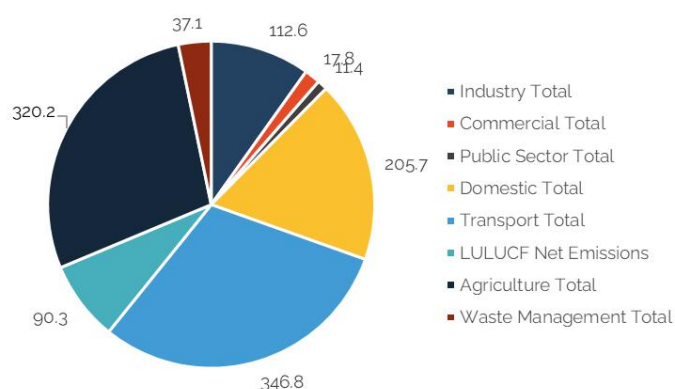
Carbon budgets are increasingly recognised as an essential tool for guiding climate action and achieving emission reduction targets. A carbon budget refers to the total amount of GHG emissions that can be released into the atmosphere within a specific timeframe, by an area, while still keeping global temperature rise below a certain threshold.

Every 5 years the UK sets and reviews its own Carbon Budget.

The Tyndall Centre for Climate Change Research has developed a methodology to allocate the global carbon budget to the United Kingdom (UK). However, in order to effectively address climate change at the local level, this UK budget must be disaggregated and further broken down for Thetford

Breckland

In 2020 Breckland produced a total of 1143 ktCO₂e, with the following breakdown:



The per capita emissions for Breckland were 8.0 tCO₂e.

According to the Tyndall Carbon Budget tool, Breckland has a total budget of 4.8 million tonnes (MtCO₂) for the period of 2020 to 2100.

Thetford

To create a high-level estimate of Thetford's carbon budget, a prorated average of Breckland's carbon budget was created.

This was done by taking Breckland's 2021 census data dividing it by the periodic carbon budgets, and then multiplying it by Thetford's 2021 census data.

The table below outlines the carbon budget for Thetford:

Carbon Budget Period	Recommended Carbon Budget (kt CO ₂ e)
2023 - 2027	285
2028 - 2032	143
2033 - 2037	71
2038 - 2042	36
2043 - 2047	18
2048 - 2100	18
Total	571

The table below outlines the comparative populations and carbon budgets for Breckland and Thetford.

	Breckland	Thetford
Population (2021)	141,500	25,241
Carbon Budget (2023 - 2100) ktCO ₂ e	4800	571

Therefore, if Thetford was to continue emitting GHG emissions at the same rate of 78.07 kilo tonnes of CO₂e per year, Thetford will have used their entire carbon budget from 2023-2100 by the end of 2030 or in approximately just over 7 years from 2023.

It is worth noting that some emissions have not been included in this analysis (such as waste), therefore the speed at which Thetford would use up their carbon budget would likely be faster.



Community Engagement

Engaging with residents within Thetford is crucial for the success of creating a sustainable community, as it ensures that the projects highlighted are well-suited to the specific needs and characteristics of Thetford.

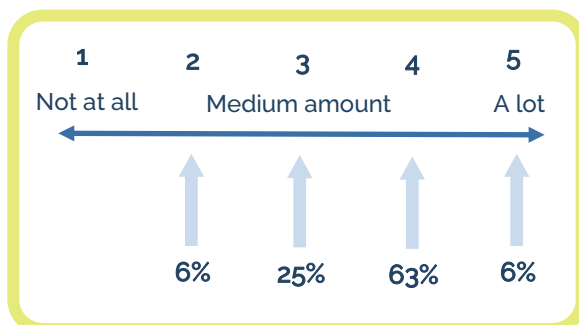
By involving local councilors, business owners, public service providers, and residents in the planning process, project ideas can be more tailored to leverage local strengths and address any challenges.

This approach not only helped in identifying the most effective and sustainable solutions but also helped create a further sense of ownership and commitment among Thetford. Additionally, engaging with the diverse community members can help with more informed decision-making and long-term success.

We asked residents of Thetford

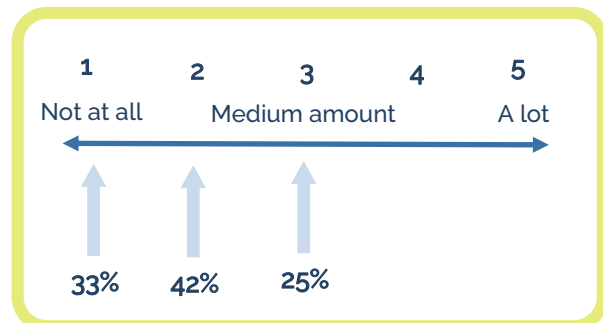
"On a scale of 1-5 how much do you worry about climate change?"

Responses we received ranged as shown:



The figure above suggests that the majority of Thetford residents asked were worried 'Quite a lot' about climate change (The most common response was 4 out of 5).

"On a scale of 1-5 how much do you know about the UK's efforts to achieve net zero emissions?"



The figure above would suggest that majority of residents asked feel they are not very educated on net zero and how it impacts the UK and their local area. (The most common response was 2 out of 5)

Therefore, a key component to Thetford's decarbonisation will be ensuring that residents understand and are onboard with becoming net zero, and enacting sustainable community practices.

"I'm worried about climate change and spend a lot of time doom-soothing"

When individuals and communities grasp how their daily activities—from driving cars to heating homes—contribute to climate change, they are more likely to adopt greener habits. Simple actions like using energy-efficient appliances, reducing waste, and choosing sustainable transportation can collectively make a significant impact. By understanding these issues, Thetford can foster a community-wide commitment to sustainability.

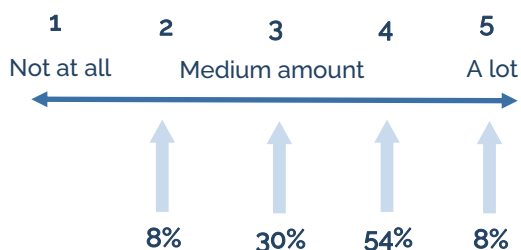




"Public transport has improved and is easier to access, giving the community more opportunities to utilise it"



"On a scale of 1-5 how likely are you to take actions that help to address climate change and achieve



The most common response from Thetford residents asked was 4 out of 5, meaning they were quite likely to take actions address that climate change.

"Having footpaths that are litter free and have better lighting will encourage people to walk more instead of driving"

We asked residents of Thetford what net zero projects they would like to see...

"I would like to see more eco-friendly means of transport available"

"I think making schools more sustainable would be a good community project"

"More EV chargers at shops and parking locations"



More accessible information about how I can help

The main findings during engagement showed residents wanted to focus on making sustainable transport more accessible for Thetford residents including bike-lanes and e-bikes.

Engagement with businesses in Thetford was excellent, facilitated by the Thetford Business Forum. This highlighted significant opportunities for collaborative projects between members that range from the Garden Centre to schools, landowners and industry. This network creates opportunities for innovative carbon reduction partnerships through solutions such as Zero Waste or 'scrap' shops (where industry waste is provided for creative projects) or 'insetting' (where partners come together to support nature based solutions such as tree planting and biodiversity corridors on suitable land locally that contribute to sequestering and storing carbon whilst providing attractive outdoor spaces.

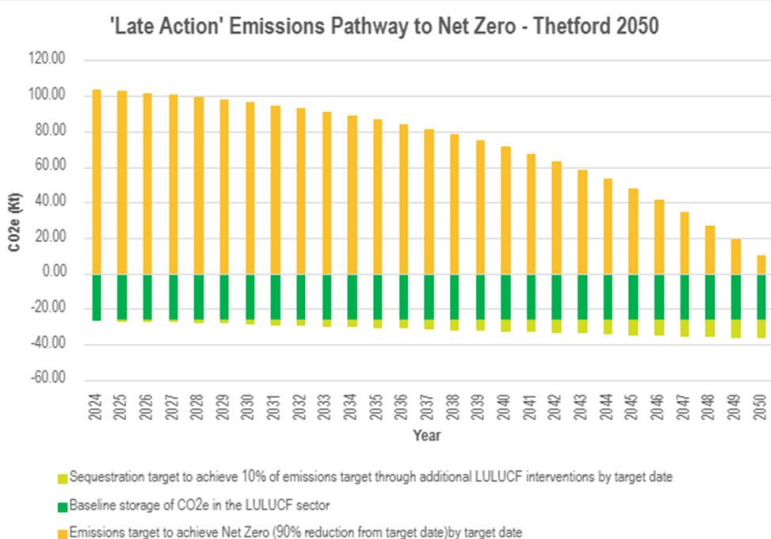
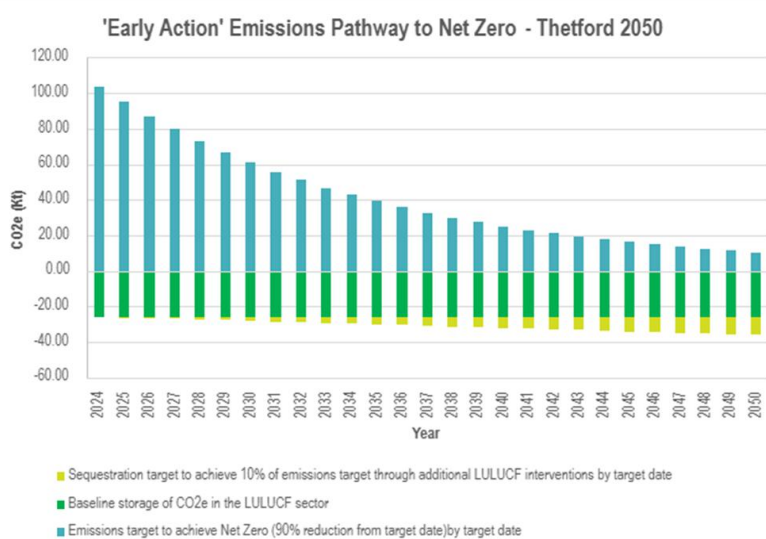


Creating a Net Zero Pathway

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 Thetford, it is important to take into account several factors including;

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

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



Decarbonisation Scenarios and Impacts

Depending upon the speed of decarbonisation within Thetford, the amount of CO₂ emitted over the same amount of time will greatly increase or decrease.

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

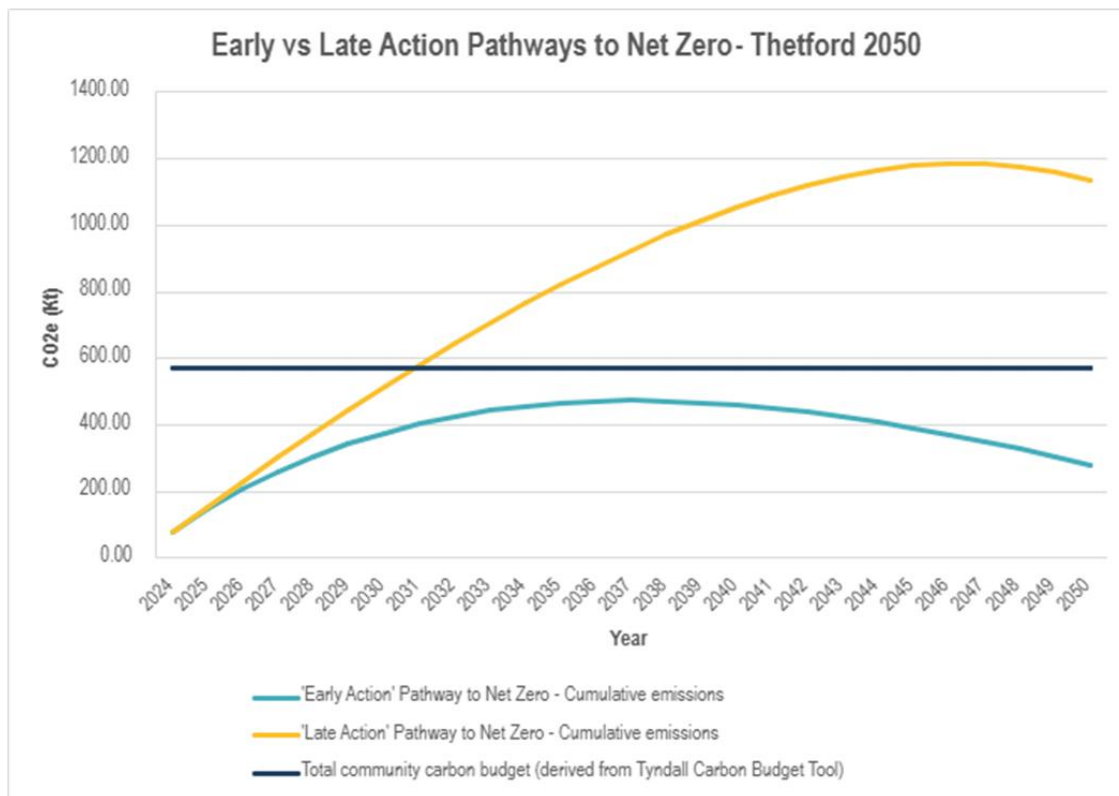
Under this scenario it assumes immediate and aggressive measures are taken to reduce emissions, leading to an earlier peak in emissions followed by a rapid decline.

In comparison this figure on 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 technologies to meet the 2050 target.

Therefore, if Thetford were to follow the **'Early Action'** pathway, the total CO₂ emitted (the area under the curve) would be far less than if Thetford were to take the **'Late Action'** curve.

Within these pathways it is also important to take into account Thetford's carbon budget of 571 kilo tonnes CO₂e (the total amount of CO₂ Thetford can produce out to 2100, in order to prevent more than 2C of warming). Under the hypothetical **'Early Action'** pathway Thetford would not use up all of its carbon budget by the time it reached Net Zero in 2050, in comparison if Thetford followed the **'Late Action'** curve, Thetford would use up its carbon budget before 2050. This is represented in the figure on the next page.



Based on the above projections if Thetford were to delay taking action it could potentially see almost a 400% overshoot of its allotted carbon budget emissions.

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 energy consumption and transitioning to electric vehicles, alongside broader initiatives including infrastructure projects and community programmes.

Within these actions there are several types of interventions:

Enabling Technologies

ET

Enabling technologies are interventions or projects that, whilst in themselves do not see an immediate reduction in carbon emissions, will facilitate further projects that do. For example, the introduction of public EV chargers to facilitate a transition to electric vehicles. The EV chargers do not directly lower CO₂ but enable residents to feel more confident in purchasing an EV knowing there are places to

Reduction Technologies

RT

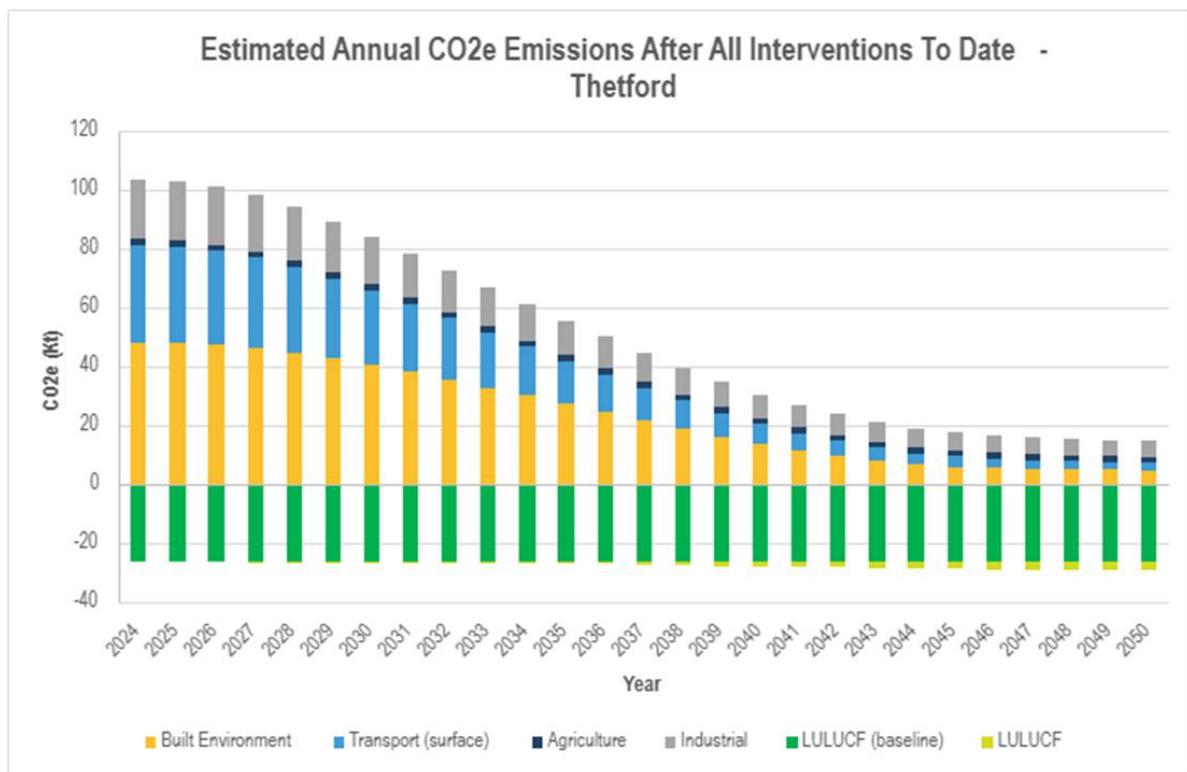
Reduction technologies are interventions or projects that will see an immediate reduction in the areas carbon emissions should they be deployed. For example, the use of solar panels on community build-

Sequestration Efforts

SE

Sequestration efforts are the only interventions or projects that can capture CO₂ emissions already in the atmosphere, helping your area to offset/rebalance its own emissions. For example, tree planting

Thetford's Pathway



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

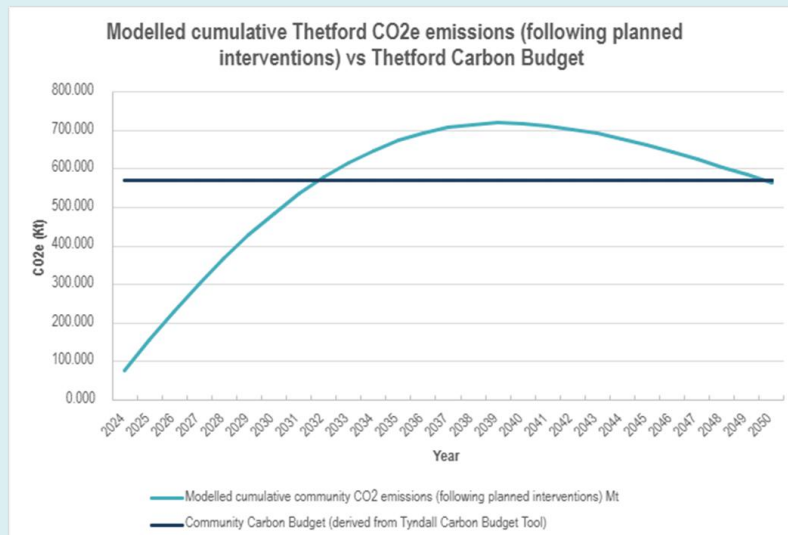
The figure above represents an illustrative pathway to Net Zero for Thetford that is achievable, taking in to account UK wide decarbonisation, consumer changes, Thetford's unique characteristics, and community feedback. The pathway sees a 90% reduction in CO₂e from 2024 to 2050, as well as an increase in sequestration efforts enabling Thetford to hit the UK's legal binding Net Zero target.

Notably, the pathway above does not stay within Thetford's carbon budget, as displayed on the right. Based on engagement, it is unrealistic to propose the kind of cuts in 2024-26 that would be needed to meet the budget (hence why Thetford's chart doesn't fall as fast as the 'early action' chart).

However it does highlight how important early action is if communities are to stay within or close to their carbon budgets.

Each of 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, for the community of Thetford to consider.





Transport

Key Transport Facts for Thetford:

**Current Public EV
Charger Locations**

9

**Current Vehicles
Registered**

11,566

If Thetford aimed to achieve Net Zero in line with the UK government targets, then between 2024 and 2050 Thetford would need to see at least a 90% reduction in transport emissions. **This would mean Thetford needs to lower their transport CO₂e emissions from 33.4 KtCO₂e to 3.34 KtCO₂e per annum by 2050.**

In order to achieve this Thetford residents would need to decarbonise their modes of transport, either through EVs, increased active travel methods (walking, cycling etc), or through greater use of public transport. Furthermore, Thetford community would want to 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 engines would be prevented, and as such, much of the emissions reduction required within the travel sector will be consumer led.

For Thetford is its predicted that by 2040 around 90% of vehicles driven within the community will be electric. This change alone would account for around a 90% reduction in transport emissions for Thetford.

However, there are several actions that Thetford community could take that will further aid the transition. The priority actions for transport based on the makeup of Thetford and feedback from community engagement, are listed below. It should be noted that certain interventions may not be the responsibility of the immediate representative council, but they have still be suggested by way of raising awareness around decarbonisation.

Intervention	Type	Number of units	kgCO ₂ Reduction per unit	Latest Year to Install Units	Total CO ₂ Reduction 2024-2050 (tonnes)	Intervention Fact Sheet Page
Car share scheme	RT	10	600	2035	16.4	-
E-bike rental scheme	RT	150	200	2028	147.6	42
EV Chargers - Fast	ET	15	1000	2035	57.2	38
EV Chargers - Rapid	ET	25	1200	2035	114.4	38
EV Buses	RT	4	10000	2040	72.1	-
Digi-Go	RT	3	8760	2035	89.1	41
Bike Hangers	ET	20	200	2035	12.6	-
Charge Fairy	ET	5	500	2045	2.4	48
EV taxis	RT	10	2000	2035	56.3	-
Bike Bus	RT	5	400	2028	5.8	-
E-Scooters	RT	50	200	2040	14.4	42
Solar Canopy Car Park	ET	3	1600	2045	7.4	40

The 'type' column refers to the technology, as found on page 26 reduction (RT), enabling (ET) or sequestration (SE). If all interventions were implemented as above that would save Thetford 5883000 kg or 0.583 ktCO₂e between now and 2050.



Built Environment

Key Built Environment Facts for Thetford:

Number of Properties

10,993

Number of Properties with EPCs

6,518

If Thetford aimed to achieve net zero in line with the UK government targets, between 2024 and 2050 Thetford would need to see at least a 90% reduction in Built Environment emissions. **This would mean Thetford needs to lower their Built Environment CO₂e emissions from 48 KtCO₂e to 4.8 KtCO₂e per year by 2050.**

Based on current government targets, by 2035 the UK's electricity grid system should be fully decarbonised, meaning that if properties were to get their power solely from the UK's electrical grid, the properties would be essentially net zero.



There are other incentives to decarbonising houses, such as saving money through retrofitting or domestic solar panels, or making properties more comfortable to live in, though from a Net Zero standpoint these changes are not necessarily required for Thetford to achieve the UK 2050 target date.

Furthermore, technologies such as solar panels and water heaters, where green energy is generated on site, begin to lose their decarbonisation value, as the UK's electricity grid decarbonises.

Therefore, Thetford'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 'Air Source Heat Pump' intervention.

The priority actions, based on the makeup of Thetford and feedback from community engagement, are listed below:

Intervention	Type	Number of units	kgCO ₂ Reduction per unit	Latest Year to Install	Total CO ₂ Reduction 2024-2050 (tonnes)	Intervention Fact Sheet Page
Wall Insulation	RT	1100	1600	2045	6761.1	39
Roof insulation	RT	1100	1600	2045	6761.1	39
Window Replacement	RT	550	1000	2045	2225.7	-
Domestic LED Lighting	RT	4400	200	2045	3513.9	-
Smart Thermostats	RT/ET	4400	200	2045	3466.7	-
Air Source Heat Pump	RT	1500	1400	2045	8498.2	49
Ground Source Heat Pump	RT	220	2000	2040	2293	51
Domestic Solar panels	RT	1650	1800	2040	6431.5	37
Domestic Solar Heaters	RT	400	1000	2040	2084.5	37
Rainwater Harvesting	RT	300	400	2040	1006	52
Community Kitchen	RT	5	400	2040	6.3	47
Zero Waste Shop	ET	3	200	2040	1.4	50

The 'type' column refers to the technology, as found on page 26: reduction (RT), enabling (ET) or sequestration (SE). If all interventions were implemented as above, it would save Thetford 43,049,400kg or 43 kilo tonnes CO₂e between now and 2050.

Land Use and Agriculture

Key Land Use Facts for Thetford:

Total Forest Land
2344 Hectares

Approximate
Number of Gardens
5500

Total Crop Land
982 Hectares

If Thetford aimed to achieve Net Zero in line with the UK government targets, then between 2024 and 2050 Thetford 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 Thetford needs to lower their Agriculture CO₂e emissions from 2.11 KtCO₂e to 0.21 KtCO₂e per year.

For the community of Thetford focusing on interventions that sequester carbon such as tree planting, and rewilding, will be pivotal to achieving Net Zero. If Thetford were to go beyond the measures listed below, it could be possible to go net negative (sequester more carbon than emitted!)

Listed below are several actions that Thetford community could take that will further aid the transition. The priority actions for Land Use, based on the makeup of Thetford and feedback from community engagement, are listed below:

Intervention	Type	Number of units	kgCO ₂ Reduction per unit per year	Latest Year to Install	Total CO ₂ Reduction 2024-2050 (tonnes)	Intervention Fact Sheet Page
Tree Planting	SE	12000	£30.00	2045	-1800	46
Rewilding (m2)	SE	10000	£0.50	2050	-65	36
Planting Hedgerows (m)	SE	3000	£1,250.00	2045	-440.5	45
Increased Allotments	SE	4000	£1,000.00	2040	-1060	-
Community Composting	RT/SE	6	£1,000.00	2040	14	-

The 'type' column refers to the technology, as found on page 26; reduction (RT), enabling (ET) or sequestration (SE)

The priority actions for Agriculture for Thetford are listed below:

Intervention	Type	Number of units	kgCO ₂ Reduction per unit per year	Latest Year to Install	Total CO ₂ Reduction 2024-2050 (tonnes)
Reduce Tillage (Hectares)	RT/ST	1000	25	2045	281.5

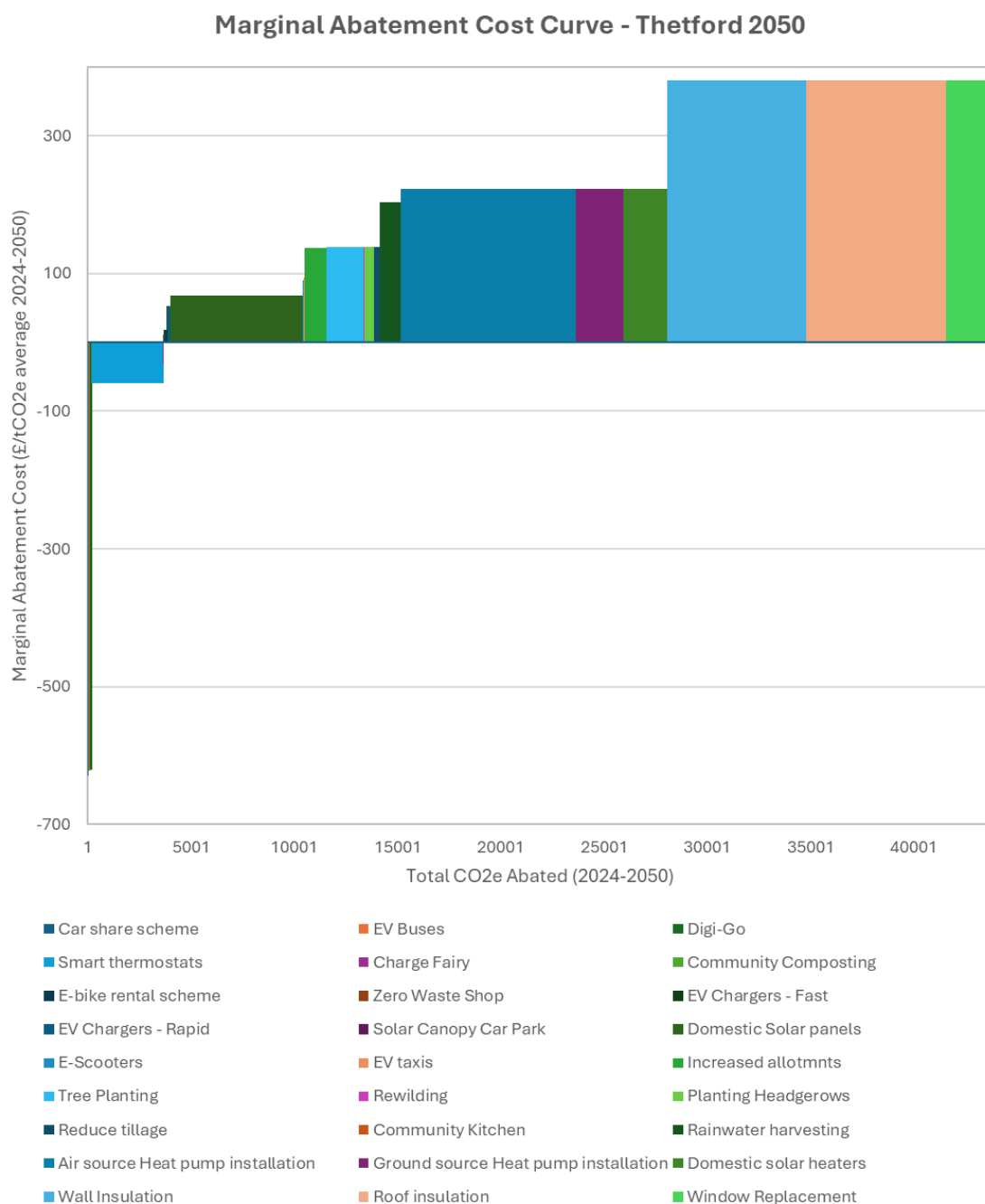


Which Projects are the Priority?

The graph below is a Marginal Abatement Cost Curve. A MACC lists various ways to reduce pollution (like using solar power, planting trees, or improving energy efficiency). For each action, it shows two things:

1. **Cost:** How much it costs to reduce one unit of pollution (like reducing one ton of carbon dioxide). Some actions might save money (like improving energy efficiency), while others might be expensive (like installing energy technology).
2. **Amount of Reduction:** How much pollution can be reduced by each action.

The graph shows the cost on one axis and the amount of pollution reduction on the other. If



The interventions have also been ranked, with the lowest scoring intervention (EV Buses) considered the top priority intervention based on the cost per kg of CO₂e saved.

Intervention	Sector	Ratio of Cost per kg CO₂e Saved (£/CO₂e)
EV Buses	Transport	-622
Digi-Go	Transport	-621
Smart thermostats	Built Environment	-60
Charge Fairy	Transport	-32
Car share scheme	Transport	-630
Solar Canopy Car Park	Built Environment	67
Community Composting	Built Environment	11
E-bike rental scheme	Transport	18
Zero Waste Shop	Built Environment	23
EV Chargers - Fast	Transport	53
EV Chargers - Rapid	Transport	53
Domestic Solar panels	Built Environment	68
E-Scooters	Transport	90
EV taxis	Transport	94
Increased Allotments	LULUCF	137
Tree Planting	LULUCF	138
Rewilding	LULUCF	138
Planting Hedgerows	LULUCF	138
Reduce tillage	Agriculture	138
Community Kitchen	Built Environment	189
Rainwater Harvesting	Built Environment	204
Air source Heat Pump	Built Environment	222
Ground source Heat Pump	Built Environment	222
Domestic solar heaters	Built Environment	222
Wall Insulation	Built Environment	380
Roof insulation	Built Environment	380
Window Replacement	Built Environment	380



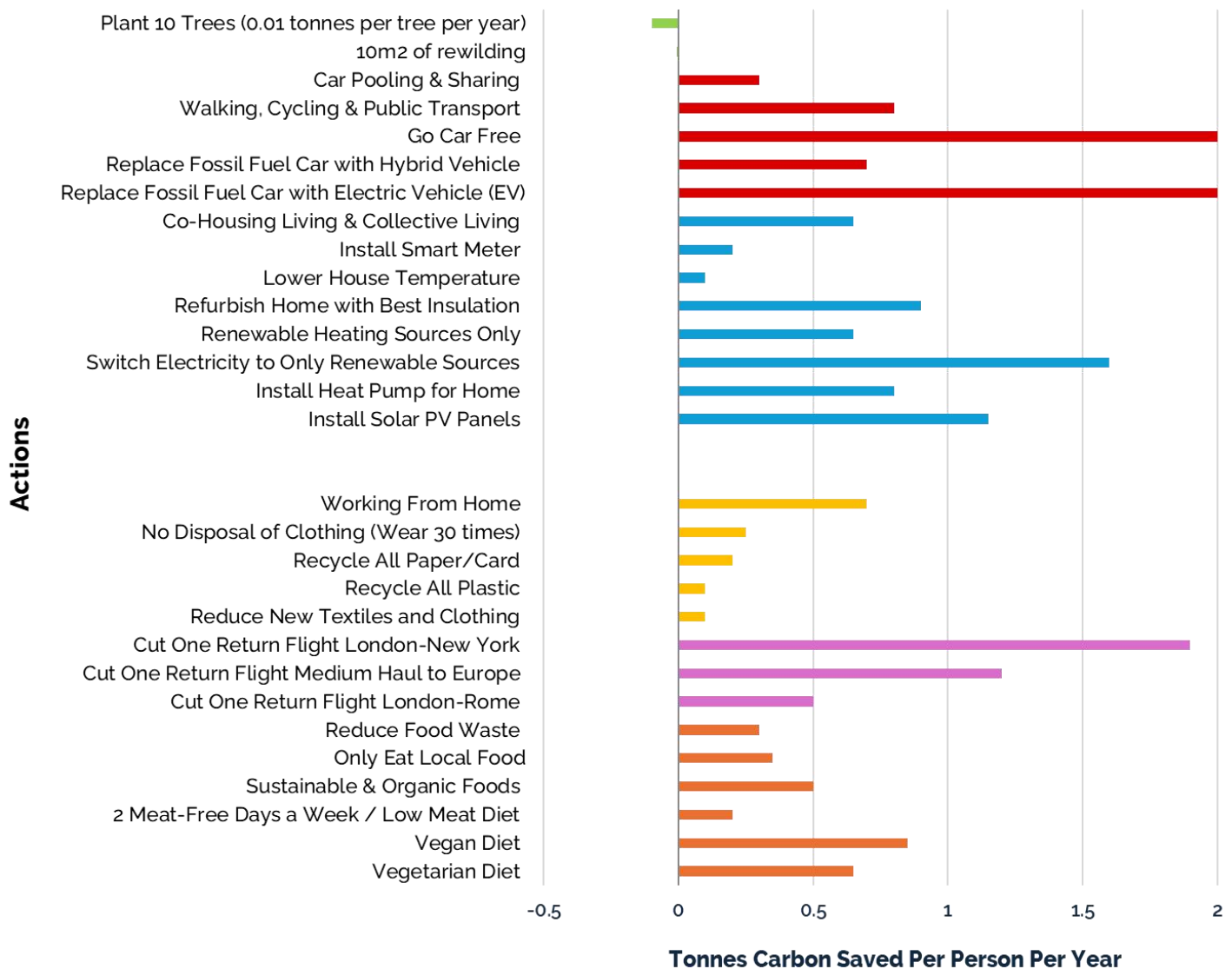
Community Projects



Reducing Our Carbon Footprint

30 Personal Behaviour Changes You could consider implementing to reduce your annual carbon footprint:

Carbon Reducing Actions



**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.

<https://www.iges.or.jp/en/pub/15-degrees-lifestyles-2019/en>

Together We Can Make A Difference

Thetford has a population of 25,492, so if:

- 20% of Thetford's population *only ate local food*, Thetford could save 1,784 tonnes of CO₂e a year.
- 60% of Thetford's population *recycled all paper and card*, Thetford community could save 3,059 tonnes of CO₂e a year.

There are approximately 5500 gardens in Thetford, so if everybody in Thetford who had a garden:

- *Planted 10 trees*: Thetford could remove 550 tonnes of CO₂e emissions a year.

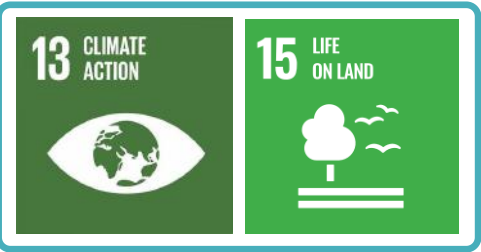
There are approximately 10,993 buildings in Thetford, so if everybody in Thetford who had a property:

- *Installed a smart meter*: Thetford could reduce its built environment emissions by 2,199 tonnes of CO₂e a year.
- *Installed a heat pump*: Thetford could reduce its built environment emissions by 8,245 tonnes of CO₂e per 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 policies 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	Lifespan	Total CO2 Saving (tonnes)
10000	0.5	0	-0.52	2026	2050	50	-65

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 revitalizing 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.



Government Targets and Policies:

2035 UK commits to decarbonise the electricity grid system

Technology	No of properties with solar installed	Cost per property	Cost saving per property	CO2 saving per property (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
Solar PV	1650	7000	800	1800	2025	2040	25	6431.5
Solar Heaters	400	7000	800	1000	2025	2040	20	2084.5

Case Studies

1 Fenn Road & Ditton Fields 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 all designed 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. Research 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. 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 (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
Fast	15	15000	750	1000	2026	2035	50	57.2
Rapid	25	17000	950	1200	2026	2035	50	114.4

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

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.

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 your DNO (UKPN)** to ensure there is sufficient electrical grid capacity in the area.

The funding opportunities listed above are subject to eligibility.



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 environmental responsibility.



Wall Insulation

Government Targets and Policies:

2025 Future Homes and building standards policy released

Insulation Type	No of properties	Cost per property	Cost saving per property	CO2 saving per property (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
Wall Insulation	1100	17500	2000	1600	2025	2045		6761.12
Roof Insulation	1100	2500	800	1600	2025	2045		6761.12

Case Study:

Suffolk County Council has 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

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.



7 AFFORDABLE AND CLEAN ENERGY



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Solar Canopy Car Park

Description:

A solar canopy car park is an innovative solution that combines parking infrastructure with renewable energy generation. It consists of a series of canopy-like structures installed over car parking spaces, each equipped with solar panels on top. The solar panels capture sunlight and convert it into electricity, providing multiple benefits to both the environment and the users of the car park. The canopy can be either connected or separate to the grid, providing there is battery storage available for excess power generated.



Government Targets and Policies:

- 2030** The UK government plans to ban the production and sale of ICE vehicles. The transition to electric vehicles creates opportunity for solar canopy car parks, as they can provide vehicle charging infrastructure powered by renewable energy.

No of car parks	Cost per car park	Cost saving	CO2 saving (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
3	£150,000	12500	1600	2026	2045	25	7.4

Case Studies:

- 1 National Cycle Centre** EvoEnergy were commissioned by Manchester City Council to design and create a solar carport system at the National Cycle Centre. The team crafted asymmetrical Y-shaped canopies 3.5m high hosting a solar array system size of 196KWP generating 171,788KWH annually.
- 2 Aviva Solar Canopy** 1,872 solar panels cover 250 car park spaces at Aviva's Broadland Business Park site and will generate 542,000 kWh annually. At peak generating capacity, Aviva will use 91% of the generated 'green' energy.

Funding Opportunities:

- RCEF/UCEF/ SEG** The UK government offers grant and incentives to support renewable energy deployment and carbon reduction initiatives. These may include grants for renewable energy projects/renewable energy generation
- ESCO's** Energy service companies may offer EPC's to finance and implement energy efficiency and renewable energy projects such as solar canopy car parks. Under the EPC, the ESCO covers the upfront costs of the project and the client pays back the investment over the agreed contract term.

Coordinate with utility companies to establish interconnection agreements for connecting the solar canopy car park to the electrical grid. Ensure compliance with utility interconnection requirements and standards.



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.



Digi-Go



Government Targets and Policies:

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

No of mini-buses	Cost per minibus set up	Cost saving per minibus	CO2 saving per minibus (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
3	£50,000	25000	8760	2027	2035	15	89.1

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

Funding Opportunities:

Bus Service Operators Grant (BSOG)	Operators that hold a zero emission bus certificate may be eligible for a 22p per kilometre rate of BSOG for those vehicles. Eligible buses must:
Zero Emissions Bus	- Meet the normal BSOG rules - Demonstrate zero tailpipe emissions - Have no internal combustion engine (for example, electric and hydrogen buses)

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 future potential future UK rollout.



E-Bike and Scooter Rental Schemes

Description:

Rental schemes offer convenient access to electric bicycles or 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	No of technologies	Cost per technology	Cost saving per technology	CO2 saving per technology (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
E-Bikes	150	£2000	200	200	2026	2028	15	147.6
E-Scooters	50	£1750	350	200	2028	2040	3	14.4

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.



Bike Bus

3 GOOD HEALTH AND WELL-BEING



13 CLIMATE ACTION



Description:

A Bike Bus is a community-driven initiative aimed at promoting cycling as a sustainable and healthy mode of transportation. Similar to a traditional school bus route, a Bike Bus consists of a group of cyclists, led by a designated leader, who follow a predetermined route to commute together. This concept encourages safety in numbers, and provides a supportive environment for new riders to gain confidence while navigating roads. Bike Buses can also play a significant role in reducing traffic congestion, improving air quality, and promoting physical activity, thereby contributing to a more sustainable and livable community.



Government Targets and Policies:

- 2040** The government will invest £101 million to improve cycling infrastructure and expand cycle routes between the city centers.
- 2040** The government will invest £85 million making improvements to 200 sections of roads for cyclists

No of bike buses	Cost per bike bus	Cost saving per bike bus	CO2 saving per bike bus (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
5	0	300	400	2026	2028	5	5.8

Case Studies:

- 1 King's Lynn Cycling Club** was founded in 2017. It has over 100 members and is open to anyone. They regularly organise events, and plan group cycling dates and routes
- 2 Wensum Valley Cycle Group** are recently formed and based in Norfolk. The routes they take tend to be more scenic and the cycling is at a leisurely pace. However they do offer a fast paced group ride once a week. The group meets on Thursday evenings, Friday afternoons and Sundays

Funding Opportunities:

- Cycle to Work Scheme** This scheme enables you to purchase a tax-free bike through your employer up to **£1000**. This can save you up to **50%** of the cost
- Big Bike Revival Grants** Cycling UK is offering grants of up to **£3,500** for voluntary and community cycle groups across England to deliver projects and activities that, Encourage people who don't cycle to cycle, Encourage people to cycle more often, increase short cycling trips, improve the perception of cycling safety, and improve people's confidence to cycle.

When setting up your own community Bike Bus its important to get insurance. This means the ride leaders and marshals will be covered in the event of claims being made against them.

You can affiliate your group will Cycling UK to get organisers liability cover for up to £10 million



Bike Hangars

Description:

Cycle hangars offer a secure, covered on-street parking solution for up to six bicycles and can be accessed using a straightforward app or traditional lock and key. Occupying the space of just one car parking spot, these hangars can help residents—particularly those in shared accommodations or apartments without ample storage—securely store their bicycles. The hangars, typically dark green with reflective safety strips, ensure visibility and protection from theft, although responsibility for stolen bicycles is not assumed by local authorities or the hangar providers.



Government Targets and Policies:

- 2040** The government will invest £101 million to improve cycling infrastructure and expand cycle routes between the city centers.
- 2040** The government will invest £85 million making improvements to 200 sections of roads for cyclists

No of bike hangars	Cost per bike hangar	Cost saving per bike hangar	CO2 saving per bike hangar (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
20	£3000	350	200	2026	2035	20	12.6

Case Study:

The **rollout of 150 cycle hangars across Brighton & Hove** has been successfully completed, enhancing the city's cycling infrastructure. These hangars, installed at 39 different locations, now offer 900 secure spaces for residents to store their bicycles. The installation began in the summer of 2022 and has been met with high demand, with over 95% of the spaces quickly allocated and more than 2,000 people on a waiting list.

Funding Opportunities:

Cycle to Work Scheme This scheme enables you to purchase a tax-free bike through your employer up to **£1000**. This can save you up to **50%** of the cost

Big Bike Revival Grants Cycling UK is offering grants of up to **£3,500** for voluntary and community cycle groups across England to deliver projects and activities that, Encourage people who don't cycle to cycle, Encourage people to cycle more often, increase short cycling trips, improve the perception of cycling safety, and improve people's confidence to cycle.

Spaces within hangars are managed by the contractors (Flaco were used by Brighton and Hove) and on average cost a resident £60 to £70 per year per space



Planting Hedgerows

Description:

Planting hedgerows involves creating rows of shrubs, trees, and other native plants along field boundaries or property lines. These living fences serve as natural barriers, providing numerous benefits to both communities and the environment. Hedgerows enhance biodiversity by offering habitat and food for wildlife, improve soil health and water retention, reduce erosion, and enhance landscape aesthetics. Additionally, they promote carbon sequestration and help mitigate climate change by absorbing carbon dioxide from the atmosphere.



Plant Hedgerows

Government Targets and Policies:

- 2030 Halve habitat loss and degradation rates
- 2030 Prevent species extinctions & improve conservation for threatened wildlife

No of meters of hedgerows	Cost per meter of hedgerow	Cost saving per meter hedgerow	CO2 saving per hedge-row (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
3000	1250	60	-15	2026	2045	5	-440.5

Case Studies:

1

Norfolk Hedgerow Network is a collaborative effort involving local farmers, landowners, and conservation groups to restore and establish hedgerows across the county. By planting hedgerows, the network aims to enhance biodiversity, provide wildlife corridors, and improve landscape connectivity while supporting sustainable agriculture practices.

2

Hedgerow Restoration Project is a partnership between a local conservation charity and the Norfolk Wildlife Trust, focuses on restoring degraded hedgerows in the North Norfolk area. Through community engagement and volunteer involvement, the project aims to enhance habitat quality, increase wildlife diversity, and improve landscape resilience to climate change.

Funding Opportunities:

- BN11: Planting Hedgerows** £22.97 per metre (m). There are several eligibility criteria's including; size, plant type, planting season, livestock proximity and access.
- Norfolk Rivers Internal Drainage Board (IDB) Hedgerow Grant** Offers grants to landowners and farmers in the **Norfolk** area to plant new hedgerows or restore existing ones. These grants aim to improve water quality, reduce flood risk, and enhance biodiversity within the local landscape

Establishing a maintenance plan is essential for the long-term success of hedgerows. Regular maintenance tasks such as watering, pruning, and weed control may be necessary, particularly during the establishment phase



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



Government Targets and Policies:

- 2025** Plant 1,000 hectares of trees annually
- 2025** Establish 10 new 'Tree Cities of the World' accredited communities

No of trees	Cost per tree	Cost saving per tree	CO2 saving per tree	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
12000	30	60	-10	2026	2045	30	-1800.0

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.



Community Kitchen

Description:

A community kitchen is a shared space where people come together to prepare, cook, and share meals. These kitchens benefit the community by fostering social connections, providing access to nutritious food, and promoting sustainable eating practices. By utilizing surplus food and emphasizing local, seasonal ingredients, community kitchens help reduce food waste and carbon emissions associated with food transportation.



Government Targets and Policies:

- 2025** Reduce food waste by 20% per capita
- 2024** Encourage food manufacturers to reduce the amount of salt and calories in their food products

No of community kitchens	Cost per community kitchen	Cost saving per kitchen	CO2 saving per kitchen (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
5	20000	200	400	2031	2040	20	6.3

Case Studies:

- 1** **Norwich Community Kitchen** was initiated by The Feed in Norfolk, Norwich Community Kitchen provides meals and employment opportunities for vulnerable individuals. Utilizing surplus food from local sources, it tackles both food insecurity and unemployment issues. By sourcing locally and offering training, it fosters community resilience and addresses social challenges.
- 2** **Ipswich Community Kitchen** is a grassroots initiative in Suffolk,. They fight food poverty and waste by repurposing surplus food into nutritious meals. Volunteers offer cooking workshops, empowering the community with culinary skills and knowledge of sustainable food practices.

Funding Opportunities:

- Norfolk Community Foundation** The Greening Our Communities fund has provided over £180,000 to over 50 sustainability focused projects since 2021.

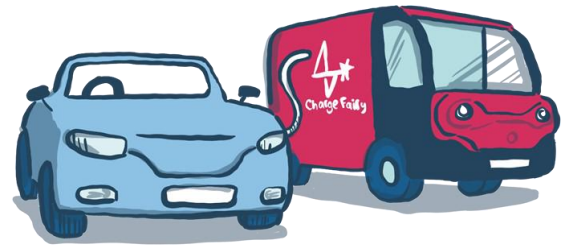
Community kitchens generate significant amounts of organic waste from food preparation and leftovers. This waste can be fed into a **biogas generator** where it is broken down to produce biogas. The biogas can then be used as a cooking fuel, directly in the kitchen, reducing the reliance on commercial gas supplies or other non-renewable energy sources.



Charge Fairy

Description:

Charge Fairy is a subscription service that EV owners can sign up to that provides them with on the go charging for their vehicles. The software pairs to your car and checks the EV's battery at the end of each day and if it is running low, a unique battery powered mobile charger will be brought to your car and charge it up in minutes.



Charge Fairy

Government Targets and Policies:

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

No of Charge Fairy's	Cost per Charge Fairy	Cost saving per Charge Fairy	CO2 saving per Charge Fairy	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
5	1750	250	500	2031	2045	3	2.4

Customer Testimonials "There are a lack of EV chargers in city centres which makes having an EV more difficult. Charge Fairy have created an innovative solution to this and is a game changer".

"The service is always so seamless and reliable, it's a unique way to access EV charging on the go and removes the worry of having to find charging points on long journeys".

Funding Opportunities:

EV Salary Sacrifice Scheme UK tax payers can utilise a salary sacrifice scheme which is a type of employee benefit programme that allows employees to exchange a portion of their pre-tax salary for the lease of an EV.

When using services such as Charge Fairy you should consider the compatibility of the technology to your car, as well as the network reliability and uptime of the charging network or service provider.



Domestic Air Source Heat Pump

Description:

A domestic air source heat pump is an energy-efficient heating and cooling system designed for residential use. 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 the 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.



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.

No of Heat Pumps	Cost per heat pump	Cost saving per heat pumps	CO2 saving per heat pump (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
1500	£350	200	1400	2025	2045	20	8498.2

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.
- 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/kwh

Funding Opportunities:

- BUS

The boiler upgrade scheme provides grant to encourage property owners to replace existing fossil fuel heating with more efficient, low carbon heating system like ASHP. Households can receive up to £7500 funding towards the purchase and installation.
- Norfolk Warm Homes Grant

This grant provides energy efficient home improvements for people who live in homes that are not heated by mains gas and have a household income of less than £36k. ASHP installation can be covered by this grant.

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).

No of zero waste shops	Cost per zero waste shop	Cost saving per zero waste shop	CO2 saving per shop (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
3	£30,000	100	200	2031	2040		1.4

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 shops also acts 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



Domestic GSHP

Description:

A ground source heat pump, also known as a geothermal heat pump, is an energy efficient heating and cooling system that harnesses the relatively constant temperature of the earth's subsurface to provide heating, cooling and hot water for residential and commercial buildings. GSHPs provide year-round comfort, while reducing energy consumption and environmental impact.



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.

No of GSHPs	Cost per GSHPs	Cost saving per GSHPs	CO2 saving per GSHPs (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
220	£14,500	750	2000	2025	2040	20	2293.0

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 9187kwh per year. 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 grant to encourage property owners to replace existing fossil fuel heating with more efficient, low carbon heating system 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.



Rainwater Harvesting

Description:

Communities can enhance their sustainability efforts and contribute to net zero goals by implementing rainwater harvesting systems on their buildings. This approach involves collecting and storing rainwater from rooftops, which can then be used for landscaping, gardening and flushing toilets. By integrating rainwater harvesting, communities can significantly reduce their reliance on municipal water supplies, lower their water bills, and decrease stormwater runoff, which often carries pollutants into local waterways.



Government Targets and Policies:

2025 DEFRA target to reduce less serious pollutions by 45% and spills from storm overflows to an average of 20 per year, by 2025

No of systems	Cost per system	Cost saving per system	CO2 saving per system (kg)	Year first action taken	Year final action taken	Lifespan	Total CO2 Saving (tonnes)
300	£3000	300	400	2026	2040	20	1006.0

Case Studies:

- 1 The Enterprise Centre at UEA** in Norwich features a rainwater harvesting system that collects, filters, and stores rainwater in below-ground tanks. This water is used for flushing toilets and garden irrigation, reducing reliance on mains water and enhancing sustainability
- 2 Eco East Anglia** has installed various rainwater harvesting systems in the region, including residential setups in Suffolk. These systems collect rainwater for use in toilets, washing machines, and gardens, helping to lower water bills and improve sustainability.

Anglian Water, the region's principal public water supply company, predicts a deficit of 593,000,000 liters a day across the East of England by 2050 if no action is taken to address supply and demand challenges.

Different size storage options of water tanks are available for different requirements. These can be stored above or below ground

Assumptions for Calculations

Carbon Budgets

Community carbon budgets are derived from data created by the Tyndall Carbon Budget Tool. The tool was developed by researchers 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 Interventions

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.

Contact Us:



Opergy
Net Zero

Website:

<https://opergy.co.uk/>

LinkedIn:

"Opergy Group" - <https://www.linkedin.com/company/opergygroup>

Emails:

mail@opergy.co.uk

Chris.Blincoe@opergy.co.uk

Andy.Hoyland@opergy.co.uk



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