

# **York and North Yorkshire's Routemap to Carbon Negative**

An ambitious co-owned plan to deliver net zero by 2034, and carbon negative by 2040.

**Priorities & Actions for 2022-2027**

Draft for Consultation: 28<sup>th</sup> February 2022

# Contents

<b>Executive Summary</b> .....	<b>3</b>
<b>Chapter 1. Why Carbon Negative?</b> .....	<b>5</b>
The Case for Action .....	5
<b>Chapter 2. The Journey to Carbon Negative</b> .....	<b>7</b>
Progress to Date .....	8
Developing the Routemap: Evidence base and engagement .....	10
Routemap Purpose & Aims .....	11
Strategic Framework .....	12
Our Approach & Principles .....	13
<b>Chapter 3. Enabling Transformation across the Economy: creating systems change</b> .....	<b>15</b>
Research, Strategy & Planning .....	17
Communication, Engagement & Movement Building .....	18
Collaboration & Innovation .....	19
Developing Skills .....	20
Programmes & Demonstrator Projects .....	21
Infrastructure, Supply Chains & Green Industries .....	22
Securing Investment .....	22
Influencing Government Policy.....	23
<b>Chapter 4. Reducing Emissions across the Economy: sector action plans</b> .....	<b>24</b>
Power.....	25
Heat & Buildings .....	30
Transport.....	35
Business & Industry.....	40
Environment – Land Use, Agriculture & Marine .....	47
<b>Chapter 5. Governance, Performance Monitoring &amp; Reporting</b> .....	<b>56</b>
<b>Appendices</b> .....	<b>58</b>
Appendix A - Summary of key studies.....	58
Appendix B - Decarbonising the built environment.....	63

# Executive Summary

## Why?

As storms, floods and wildfires intensify across the world, there is growing urgency for collective action to tackle climate change. The 2021 IPCC report is a code red for humanity; we are already at 1.2°C warming and are at imminent risk of reaching the internationally agreed threshold of 1.5 °C. In York and North Yorkshire, we have a critical contribution to make to national and global efforts; we have the potential to go beyond net zero, and become England’s first carbon negative region. With two national parks, three Areas of Outstanding Natural Beauty (AONBs) and over 70% of our geography being used for agriculture, we are uniquely positioned to use our natural assets to capture and store carbon. As a leader in decarbonisation and world class innovation assets, we can harness the economic opportunities of the transition, creating jobs and attracting investment to the region. This Routemap provides an ambitious pathway for local authorities, businesses, charities, academia and communities to come together to deliver carbon reduction at the necessary pace and scale to reach net zero by 2034, and net negative by 2040.

## What?

The series of targets and actions set out in this Routemap have been informed by comprehensive stakeholder engagement and a growing evidence base, including York and North Yorkshire’s Carbon Abatement Pathways study. Our approach is based on the strategic pillars of decarbonising our energy system, moving towards a circular economy and enhancing our natural capital, which seeks to ensure that we are taking a holistic approach and delivering benefits beyond carbon to create a greener, fairer, stronger economy.

Within our places and across key sectors - Power, Heat & Buildings, Transport, Industry & Business, Land Use, Agriculture and Marine– transformative change is needed. Through our research, we understand the scale of ambition required - from doubling the current size of woodland in the region to halving private car use to retrofitting 250,000 homes. The Routemap sets out key strategic priorities to deliver these changes.

## How?

We need to create the conditions to enable the movement towards a carbon negative York and North Yorkshire. Through our research and stakeholder engagement, we have identified a number of enablers – including: Research, Strategy & Planning; Communication, Engagement & Movement Building; Collaboration & Innovation; Developing Skills; Programmes & Demonstrator Projects; Infrastructure, Supply Chains & Green Industries; Securing Investment; and Influencing Government Policy.

## Who?

The Routemap has been developed collaboratively, and must be delivered collaboratively. Every local authority, business, organisation, charity and community has a role to play. Every individual can make a difference. The Action Plans in the Routemap identify organisations who have a clear leadership role in delivery.

## Where?

In the process of implementing the Routemap, we will need to understand ‘where’ projects and activities need to be delivered. Some of these decisions will be made at an organisational level, and others will require a more strategic approach across the region, such as ensuring the right tree is planted in the right place, or identifying the most viable locations for heat networks. A number of forthcoming strategic, spatial plans will fill this remaining gap – including, the underway Local Area Energy Plans (LAEP) and forthcoming Local Nature Recovery Strategy and Natural Capital Investment Plan.

### Routemap Purpose

The overarching aim of the Routemap is to provide a clear, co-owned plan to accelerate the transformation to a carbon negative York and North Yorkshire.

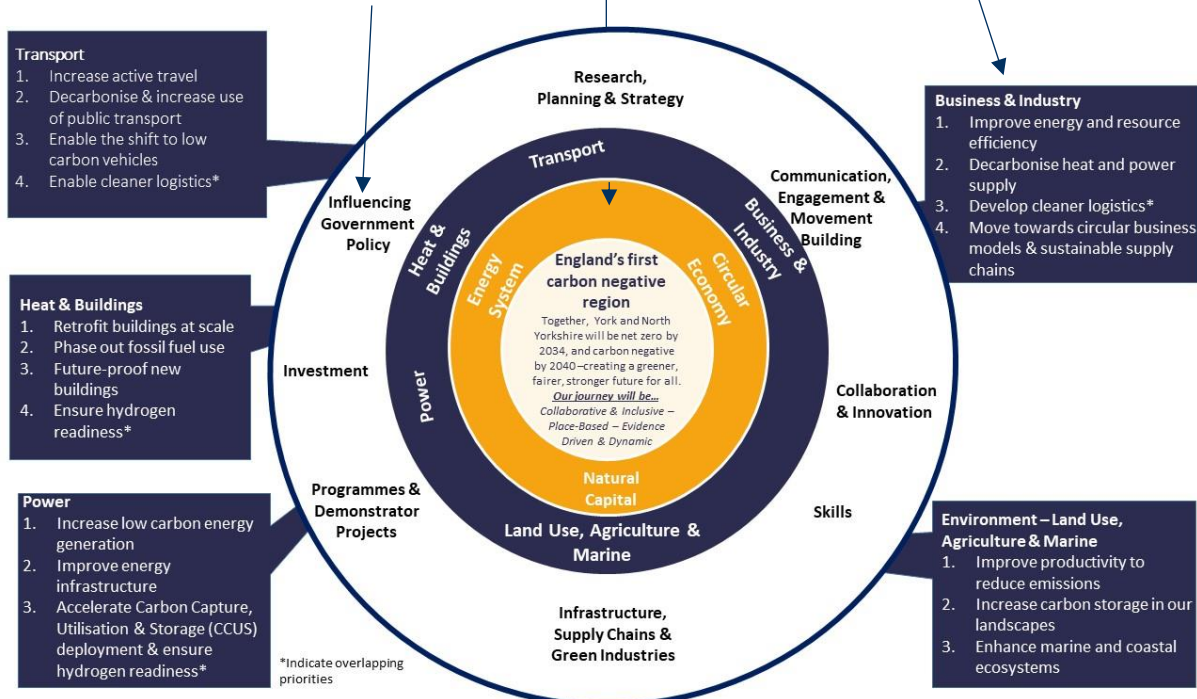
The specific objectives of the Routemap are:

- To provide strategic direction and a coordinated approach to decarbonisation;
- To catalyse collaborative action at pace and scale;
- To build confidence that reaching net zero and beyond to carbon negative is feasible;
- To harness the economic opportunities of net zero, leveraging public and private sector investment; and
- To position York and North Yorkshire at the forefront of national climate action and provide a platform to influence Government policy and funding.

### Our Strategic Framework

Building on an extensive evidence base and working closely with stakeholders, our framework sets out our approach to delivering England’s first carbon negative region.

The framework summarises the “what” – our strategic pillars and priorities for each sector, alongside the “how” – the key enablers to create a carbon negative economy.



### What’s in the Routemap?


This document is a draft version for consultation, and clearly recognises the gaps that remains in how our ambition will be delivered. The Routemap sets out a long term direction of travel, but focuses on priorities and actions between 2022 and 2027 - due to key decisions needing to be made at a national level which will impact our pathway to net zero. The document includes the following sections:

- Why Carbon Negative? The Case for Action
- Our Journey to Carbon Negative
- Enabling Transformation across the Economy: Creating Systems Change
- Reducing Emissions across the Economy: Sector Action Plans
- Governance, Performance Monitoring & Reporting

# Why Carbon Negative?

## The Case for Action

1. As storms, floods and wildfires intensify across the world, there is **growing urgency for collective action to tackle climate change**. The 2021 IPCC report is a code red for humanity; we are already at 1.2°C warming and are at imminent risk of reaching the internationally agreed threshold of 1.5 °C. The **viability of our economy and communities depend on urgent action**.
2. In York and North Yorkshire, climate change is predicted to increase the frequency and severity of flooding, increase temperatures, cause water shortages and rising sea levels. The disruption to business, impact on food production, damage to physical assets and destruction of ecosystems that underpin key sectors will **create substantial costs for the region and threaten the ability to do business here**. The UK Government recognise that the sooner we act on climate change, the lower the costs will be. The Office for Budget Responsibility concluded that there would be significant fiscal benefits from early action to transition to net zero, meaning the costs will be lower than if we delay.
3. In York and North Yorkshire, we have a critical contribution to make to national and global efforts to tackle climate change; **we have the potential to go beyond net zero, and become England's first carbon negative region**. This means, that as a region, we will be capturing and storing more carbon than we emit. With two national parks, three Areas of Outstanding Natural Beauty (AONBs) and over 70% of our geography being used for agriculture, we are uniquely positioned to use our natural assets to capture and store carbon. We are home to a thriving bio-economy; with a world-class cluster of innovation assets, BioYorkshire aims to build on the region's unique strengths in research, industry and farming to create a global, bio-innovation powerhouse that will level up the economy in Yorkshire and the north of England. We also have Drax power station on our patch, with their pioneering greenhouse gas removal technology - Bioenergy with Carbon Capture and



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RESULTING IN SEVERE AND  
IRREVERSIBLE CHANGES TO THE  
PLANET, THE ENVIRONMENT, AND  
HUMAN SOCIETY.”

UK GOVERNMENT NET ZERO  
STRATEGY

Storage (BECCS). As a leader in decarbonisation, we can harness the economic opportunities of the transition, creating jobs and attracting investment to the region.

4. **Early and ambitious action will also help us to protect key sectors** within our region, such as agriculture, food & drink manufacturing and tourism. These sectors are particularly vulnerable to the impacts of climate change, increasing energy prices and changing policy.



#### KEY SECTOR OPPORTUNITIES

##### INCLUDE:

- AGRI-TECH
- BIO BASED CONSTRUCTION
- HOUSING RETROFIT
- RENEWABLE ENERGY
- FORESTRY & TREE SUPPLY CHAINS
- HEMP SUPPLY CHAIN

Early action will also enable us to **maximise the co-benefits of net zero** for people, the environment and the economy.

The transformation to a carbon negative York and North Yorkshire, can provide **cleaner air, more equitable access to resources, cheaper energy bills** and more **empowered communities**. We can also use the transition to reverse the decline of nature and tackle the **biodiversity crisis**. The decoupling of economic activity from environmental damage, will strengthen our economy and provide **new opportunities** for businesses.

5. To ensure we achieve our collective ambition to be carbon negative by 2040 and deliver these significant co-benefits, we need a co-owned plan to reduce emissions across the economy and increase greenhouse gas removals. This Routemap provides this plan – with an **ambitious pathway to become England's first carbon negative region**, whilst supporting the levelling up the region with new green jobs, reversing the decline of our natural environment and attracting investment. **Together we can create a greener, fairer, stronger future.**

# The Journey to Carbon Negative

This chapter includes:

- Progress to Date
- Developing the Routemap: Evidence base and engagement
- Routemap Purpose & Aims
- Strategic Framework
- Our Approach & Principles

# The Journey to Carbon Negative

## Progress to date

York and North Yorkshire has **made significant progress over the last few years** in raising the profile of the low carbon agenda, developing and delivering net zero strategies, increasing collaboration and building capacity for action. The ambition to be England's first carbon negative region is now the economic USP for the region. York and North Yorkshire LEP and our local authorities have been at the forefront of driving action – taking a strategic leadership role, as well as delivering low carbon projects.

We are not starting from scratch with this document. This Routemap **builds upon existing low carbon strategies and activities**. The Routemap utilises strategic priorities and lessons learnt from York and North Yorkshire's Local Energy Strategy (published in February 2019) and Circular Economy Strategy (launched in November 2019), alongside local authority climate action plans and business net zero plans.

Figure 1, shown on the next page, provides a snapshot of the current climate action landscape. The Routemap aims to provide an **umbrella strategy for York and North Yorkshire, connecting the dots** between activities within our region, as well as ensuring the **alignment with wider regional and national policy, partnerships and programmes**.



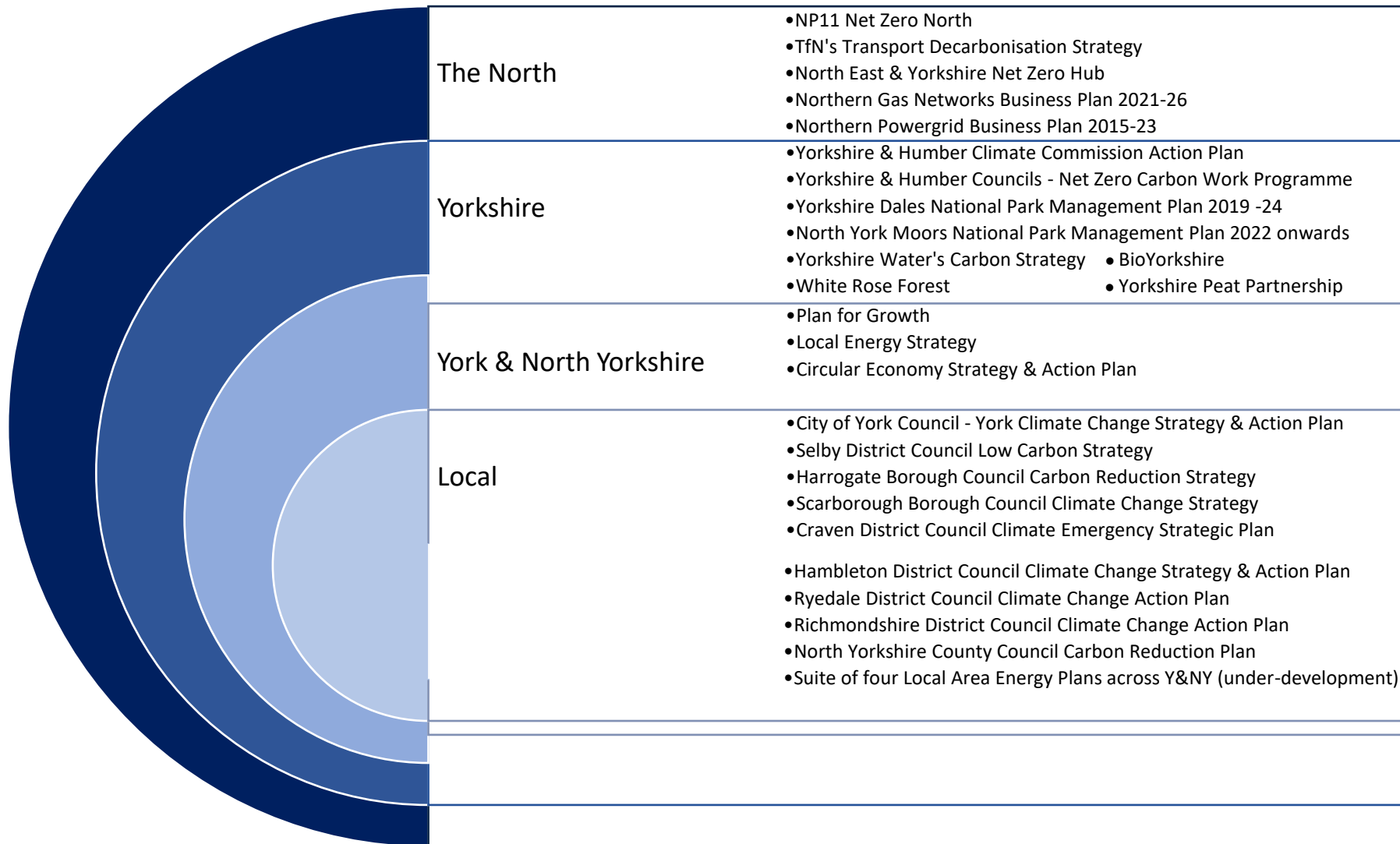


Figure 1. Climate Action Landscape

## Developing this Routemap: Evidence base and engagement

A number of studies have informed the development of the Routemap, which are outlined in Appendix A. This includes research undertaken by the Tyndall Centre to establish a carbon budget for the region that ensures we make our ‘fair’ contribution towards the Paris Climate Change Agreement. Following this, York and North Yorkshire LEP commissioned a **study to understand potential pathways to get to net zero** across key sectors – transport, buildings, industry, power, and land use and agriculture. York and North Yorkshire’s **Carbon Abatement Pathways (CAP) study** provides the basis of the evidence base for the Routemap.

To date, over **200 stakeholders have been engaged** in the CAP study and Routemap development process, including:

- Experts and key stakeholders were initially engaged in developing the **modelling of the pathways** for each sector.
- In summer 2020, the LEP undertook a comprehensive phase of stakeholder engagement through a **consultation and follow-up workshops to seek initial views on the study findings and to co-develop policy**.
- In November 2020, the **full study findings were shared with stakeholders**, alongside workshops to **collaboratively develop projects** in areas where urgent action is required. This further stakeholder feedback was incorporated into the Carbon Abatement Pathways Study final report, which was finalised and published on the LEP’s website in March 2021.
- In summer 2021, the LEP hosted a series of Roundtable discussions designed to **challenge and validate the CAP study findings**, alongside consolidating prior stakeholder engagement to agree key actions within the Routemap to Carbon Negative. This was followed by a series of engagement activities with key boards and steering groups.
- Over the past 6 months, we have been engaging with key stakeholders, partnerships and boards to **develop the sector emerging priorities and interventions**.

*We are now in the next phase of consultation with stakeholders to gather feedback on the first draft of the Routemap (28<sup>th</sup> February – 17<sup>th</sup> March 2022). During this time, we will also be holding focused sessions with stakeholders where gaps in delivery persist.*

*Following the consultation, we will collate feedback and work with stakeholders to further develop the Routemap as needed. We expect the Routemap to be finalised by July, and formally launched in September 2022.*

## Routemap Purpose

**The overarching aim of the Routemap is to provide a clear, co-owned plan to accelerate the transformation to a carbon negative York and North Yorkshire.** The Routemap sets out a long term direction of travel and scale of ambition, but focuses on priorities and actions between 2022 and 2027 - due to key decisions needing to be made at a national level which will impact our pathway to net zero.

### The specific objectives of the Routemap are:

- To provide strategic direction and a coordinated approach to decarbonisation;
- To catalyse collaborative action at pace and scale;
- To build confidence that reaching net zero and beyond to carbon negative is feasible;
- To harness the economic opportunities of net zero, leveraging public and private sector investment; and
- To position York and North Yorkshire at the forefront of national climate action and provide a platform to influence Government policy and funding.

### The Routemap is not intended to:

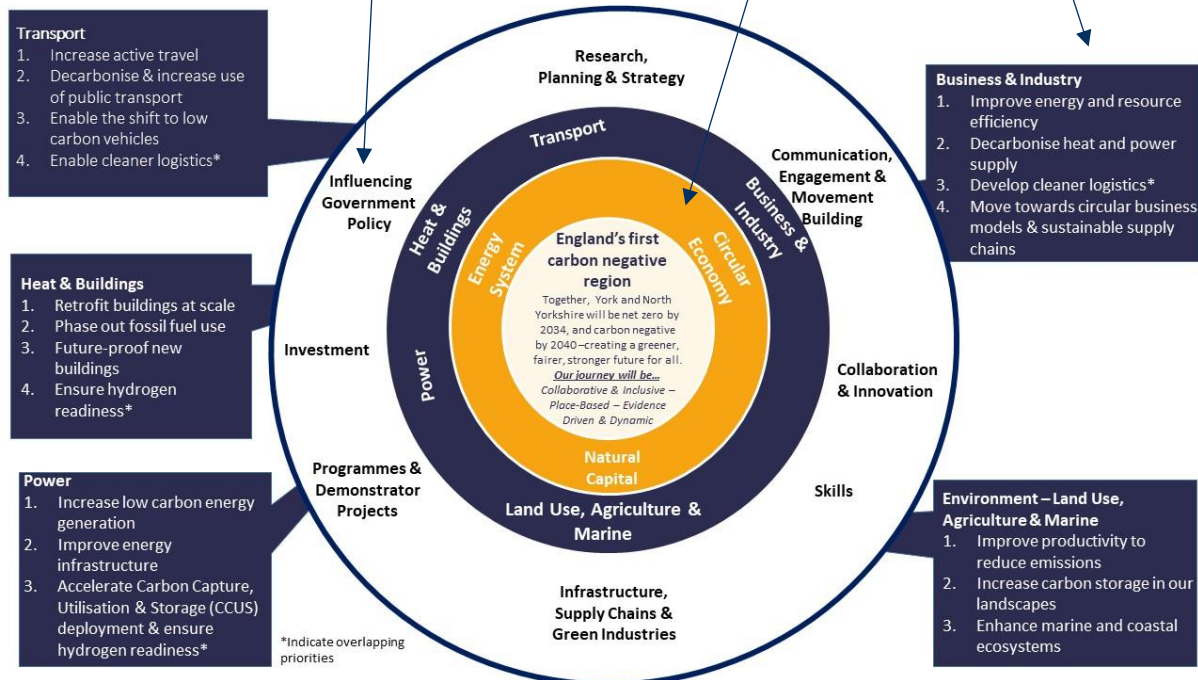
- **Be the only decarbonisation plan in the region.** The Routemap will help coordinate action and build a golden thread between business, local authority, regional and national net zero strategies.
- **Provide all the solutions to reach net zero and beyond.** Gaps in policy, investment, local capacity and the market remain, and will require changes at a national level that are outside the control of regional stakeholders.
- **Be a static document.** As the world around us evolves in terms of knowledge, legislation and policy, technology and markets, we will adapt to take advantage of these opportunities. The Routemap will be a living document – actions will be updated as required, with a formal update undertaken annually.

The Routemap is focused on climate change mitigation (i.e., reducing greenhouse gas emissions), rather than climate change adaptation. We recognise the importance of climate change adaptation and resilience, and that future work will be required to ensure a coordinated and strategic approach across the region.

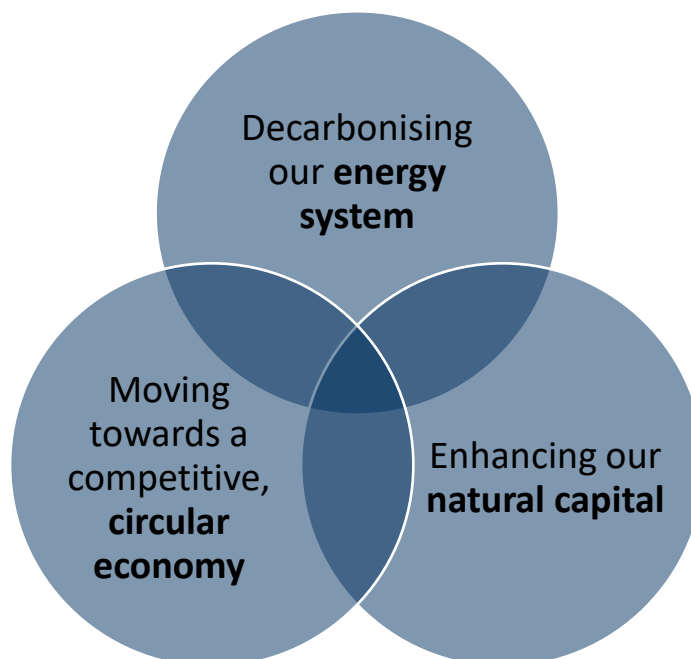
## Routemap Strategic Framework

Building on an extensive evidence base and working closely with stakeholders, our framework sets out our approach to delivering England’s first carbon negative region.

The framework summarises the “what” – our strategic pillars and priorities for each sector, alongside the “how” – the key enablers to create a carbon negative economy.



**Our approach to deliver net zero and beyond to carbon negative is based on the following strategic pillars:**



**Decarbonising our Energy System:** Approximately 70% of York and North Yorkshire’s existing Scope 1 and 2 emissions are associated with our energy system<sup>1</sup>. We will deliver systems solutions to decarbonise power, heat and buildings, and transport systems.

**Moving towards a competitive Circular Economy:** research shows that half of global carbon emissions and 90% of biodiversity loss are driven by resource use. Whilst our ambition to be carbon negative by 2040 is for Scope 1 and 2 emissions, we do aim for the Routemap to also reduce Scope 3 emissions<sup>2</sup>. We don’t yet have a baseline for the region’s Scope 3 emissions, but we expect the emissions that occur outside the Y&NY’s boundary as a result of activities taking place within the region to be substantial. The circular economy can help tackle these scope 3 emissions, as well as reducing waste and improving resource efficiency within the region.

**Enhancing our Natural Capital:** through investing in our natural assets, research estimates that we can sequester up to 2.9MtCO<sub>2</sub>e<sup>3</sup>. This means restoring our peatlands, planting trees, planting diverse grasslands and flower meadows, improving soil quality, growing crops with high carbon sequestration potential (such as hemp) and improving marine ecosystems.

<sup>1</sup> Element Energy (2021) York and North Yorkshire Carbon Abatement Pathways Study

<sup>2</sup> Scope 1 emissions: emissions from sources located with York and North Yorkshire boundaries

Scope 2 emissions: emissions occurring as a consequence of the use of grid-supplied electricity, heat, steam, and/or cooling

Scope 3 emissions: emissions that occur outside of York and North Yorkshire boundaries as result of activities taking place within the region.

<sup>3</sup> Eftec (2020) York, North and West Yorkshire Natural Capital Study

## Our principles to deliver transformative action:

- **Collaborative & Inclusive**

Unprecedented collaboration is required to deliver net zero, and beyond to carbon negative. We will build on the strong existing partnerships across the region and enable genuine collaborative action to ensure that a diversity of views are listened to in the shaping and delivery of initiatives, and that we achieve the pace and scale of change required. We will ensure that no community or organisation is left behind.

- **Place-based**

York and North Yorkshire is made up of distinctive historic assets and landscapes across our cities, towns, countryside, and coastline. People are at the heart of these diverse places. We will ensure that the transition to net zero empowers communities to make decisions about the future of their places, and enables them to lead their own sustainability journeys. The Routemap is designed to build on the existing strengths and distinctive assets of the region to create economic opportunities and support the levelling-up of the region. We recognise the importance of “where” initiatives and technologies are rolled out – we will be developing spatial plans to ensure the “right option, in the right place”.

- **Evidence-driven & Dynamic**

We will utilise emerging evidence and lessons learnt from pilot projects to inform and adapt our approaches. The Routemap will be a living document – it will be regularly reviewed and refreshed in light of new national policy, local priorities and progress made.

The following sections outline the approach to reduce emissions across key sectors and enable the transition.

# **Enabling Transformation across the Economy: Creating Systems Change**

**This section includes:**

- **Research, Strategy & Planning**
- **Communication, Engagement & Movement Building**
- **Collaboration & Innovation**
- **Developing Skills**
- **Programmes & Demonstrator Projects**
- **Infrastructure, Supply Chains & Green Industries**
- **Securing Investment**
- **Influencing Government Policy**

## Enabling Transformation across the Economy: Creating Systems Change

### Introduction

Creating a thriving carbon negative region will require changing how our “systems” operate – from our homes and local communities, to our businesses and other organisations, to our transport, energy or food system. Our entire economy needs to change.

- For York and North Yorkshire’s economy, this will mean **decoupling economic growth from the production of greenhouse gas emissions**, consumption of finite resources and environmental damage. This will allow our economy to thrive within the finite limits of the planet.
- For **businesses and other organisations, this means changing how they operate** – sourcing their energy from green technologies, saving costs through more efficient processes, rethinking business models to better meet customer needs and attracting the best talent with ambitious sustainability strategies.
- For **individuals, we all have a role to play in making small changes to our daily lives** – this may mean cycling to work, using a heat pump to keep your home warm, buying your food from local farms and reducing food waste.

Although the scale of change set out in this document is vast, it’s important to remember the transformational benefits go far beyond reducing carbon – providing cleaner air for us to breathe, more opportunities for us to enjoy our beautiful landscapes, greater community cohesion through working together, and reduced costs for households and businesses. In York and North Yorkshire, we can also seize unique opportunities to transform and level up our economy. With world class innovation assets, research facilities and industry capabilities, the bio economy presents significant opportunities to sequester carbon and grow the economy.

Whilst specific projects and programmes will deliver carbon reductions, **we need to have a strategic and holistic approach to enable change across the region**. Through extensive research and stakeholder engagement, we have identified a number of “enablers” that will create the conditions for a carbon negative York and North Yorkshire:

- **Research, Strategy & Planning**
- **Communication, Engagement & Movement Building**
- **Collaboration & Innovation**
- **Developing Skills**
- **Programmes & Demonstrator Projects**
- **Infrastructure, Supply Chains & Green Industries**
- **Securing Investment**
- **Influencing Government Policy**

The section explains what we mean by each of the enablers, and details overarching priorities and actions that are relevant across sectors. For many enablers, actions are specific to sectors, and are hence detailed in Sector Action Plans in Chapter four.



## 1. Research, Strategy & Planning

- **Develop a strong evidence base:** In developing this Routemap, we have established a significant evidence base which we will continue to build as required. This will ensure we have an evidence-based approach and embed a culture of learning. Further research required is outlined in the Sector Action Plans.
- **Develop major strategies:** For some areas, further strategy development is required to ensure that we take a coordinated approach across the region. For example, the development of a Local Nature Recovery Strategy, which we will seek to ensure also supports our carbon negative ambition.
- **Develop implementation and spatial plans:** In the process of implementing the Routemap, we will need to develop further implementation plans and understand ‘where’ projects and activities need to be delivered. Some of these decisions will be made at an organisational, community or household level, and others will require a more strategic approach across the region, such as ensuring the right trees are planted in the right place, or identifying the most viable locations for heat networks. A number of forthcoming strategic, spatial plans will fill this remaining gap – including, the underway Local Area Energy Plans (LAEPs) and forthcoming Natural Capital Investment Plan.

Overarching Interventions	Lead & Partners
<b>Share key net zero research</b> with stakeholders via the Y&NY LEP website and newsletters.	<b>Y&amp;NY LEP</b>
<b>Refine and implement Local Area Energy Plans.</b> A suite of four Local Area Energy Plans (LAEPs) are already under-development to provide York and North Yorkshire with strategic spatial plans for a fully decarbonised energy system. Draft plans will be completed by July 2022 and adopted in 2023, implementation reviewed annually. The LAEPs will directly support decarbonisation of power, heat & buildings, transport and industry – and are hence also referenced in the sector action plans.	<b>Y&amp;NY LEP, Local Authorities, Northern Powergrid, Northern Gas Networks</b>
<b>Local Planning Policy Review:</b> Undertake a review of local planning policy to identify options to change local planning policy to support the delivery of the strategic objectives set out in this Routemap.	<b>Local Authorities</b>
<b>York and North Yorkshire Heritage and Culture Strategy Group:</b> Building on the “Celebrating our Distinctive Heritage” report (jointly commissioned by Historic England and Y&NY LEP), a York and North Yorkshire Heritage and Culture Strategy Group has been created. The Group will build on the report and drive forward selected recommendations based on impact and deliverability, providing strategic oversight and enhance the delivery of placed-based regeneration projects. This includes further research into the prevalence of underused heritage assets, alongside supporting the retaining and adapting of heritage assets. (This intervention will also contribute to supporting collaboration).	<b>Y&amp;NY LEP, Historic England, Arts Council England, National Lottery Heritage Fund</b>
<b>Develop a circular economy framework and work programme for Yorkshire &amp; Humber.</b> As part of the Yorkshire & Humber Councils’ net zero carbon workstream, work with local authorities, industry and academia to build a regional framework and associated programme. The delivery of the	<b>Yorkshire &amp; Humber Councils (net zero carbon sub group)</b>

work programme will support collaboration and engaging a wide-range of stakeholders.	Yorkshire Circular Lab, Private Sector.
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## 2. Communication, Engagement & Movement Building

- **Effectively communicate and engage stakeholders:** Getting people and organisations on board is absolutely critical to delivering this Routemap. We now know what we need to do to get to net zero and beyond to carbon negative, but communicating these solutions and obtaining buy-in remains a huge challenge. An important part of reaching and engaging people is communicating the most appealing co-benefits (e.g., saving money, cleaner air, improved health) to different types of stakeholders.
- **Build a movement:** To tackle the climate crisis and achieve our carbon negative ambition, we need the majority of people engaged and taking action. We need to build a critical mass of support and empower businesses, communities and individuals to lead the change. This includes building capacity within organisations and communities to develop low carbon projects and embed net zero across all functions of an organisation, or parts of a community.

Overarching Interventions	Lead & Partners
<b>Translation of sector priorities</b> and interventions into infographic summaries for targeted audiences. These will enable different organisations to clearly see their role in delivering York and North Yorkshire’s carbon negative ambition and the benefits of being involved. Research and engagement will be undertaken to ensure the right language is used to appeal to specific audiences.	<b>Y&amp;NY LEP</b>
<b>Region-wide public facing campaign</b> to increase awareness and knowledge of practical steps individuals can take to reduce their carbon footprint and join the movement to create a thriving, carbon negative region. The campaign would be co-designed with key organisations in the region, providing overarching branding/assets/resources that local authorities, other organisations and community groups could use locally. The campaign would be designed to ensure that local areas have freedom and flexibility to shape and lead their own campaigns locally. Sufficient funding and capacity needs to be secured to develop and deliver an effective campaign.	<b>Local Authorities, Community First Yorkshire</b> Additional partners to be identified
<b>Circular Yorkshire Week:</b> Co-design and co-deliver an annual campaign to raise awareness of the circular economy, inspire action and enable collaboration.	<b>Y&amp;NY LEP</b> YorWaste, Biorenewables Development Centre (BDC), University of York, FSB, Cooper King Distillery, SeaGrown, Local Authorities (+others)

<p><b>Empower community climate action:</b> Building on Community First Yorkshire’s <a href="#">Climate Change Toolkit</a>, collaboratively develop a package of measures to support communities to understand climate change, take action and apply for funding. This will include engaging young people, developing a range of resources and guides, rural energy roadshows, training and developing community climate champions.</p>	<p><b>Community First Yorkshire, Local Authorities</b></p>
<p><b>Establish a Circular Towns and Communities Network:</b> Building on the successful Circular Malton, Circular Coast and Our Zero Selby pilots create a network of circular economy towns and communities across the region. The network will utilise the Circular Towns Guide and facilitate the sharing of best practice between places.</p>	<p><b>Y&amp;NY LEP</b> Circular Malton CIC, Coast &amp; Vale Community Action, Selby AVS, Local Authorities, Community First Yorkshire</p>
<p><b>Building capacity for net zero across key anchor institutions:</b> Develop a work programme to increase capacity and capabilities for key organisations in the region to develop and deliver net zero projects.</p>	<p>Lead &amp; partners to be established.</p>

### 3. Collaboration & Innovation

- **Enable collaboration:** Delivering on our carbon negative ambition will require unprecedented collaboration. We need to bring people and organisations together to co-create and deliver projects.
- **Support innovation:** There are specific areas where innovation is required to advance technology development – particularly for agriculture, power and industry. We also require innovation in terms of thinking differently and developing new approaches.

Overarching Interventions	Lead & Partners
<p><b>Convene and enable collaboration between York and North Yorkshire Local Authorities and localities.</b> The Local Authority Climate Action Coordinator will support:</p> <ol style="list-style-type: none"> <li>1. <b>Strategic coordination and supporting wider regional work</b> – understanding what scale climate action interventions are required and connecting the dots between activities.</li> <li>2. <b>Engaging and activating SMEs</b> – working in partnership to develop a package of measures to support SMEs in YNY to decarbonise.</li> <li>3. <b>Developing supply chains and skills</b> – connecting businesses with higher education and skills providers to build the supply chains for housing retrofit, EV installation/maintenance and renewables.</li> <li>4. <b>Driving collaboration</b> – continue to convene YNY LAs to support collaboration and sharing best practice, and enable wider partnership working with anchor institutions.</li> </ol>	<p><b>Y&amp;NY LEP, Local Authorities</b></p>

<p><b>Making data and information available:</b> Support innovation by making local data and information available to enable partnerships to develop innovative solutions and services.</p>	<p><b>Local Authorities, Y&amp;NY LEP</b></p>
<p>The <b>Yorkshire Circular Lab</b> supports communities, government bodies and companies in the transition towards a circular economy. Plans for the Yorkshire Circular Lab were co-produced with stakeholders across the region. Together, we developed a partnership to deliver on five priority areas for action:</p> <ol style="list-style-type: none"> <li>1. Develop a knowledge and tools hub to make scientific evidence accessible for practitioners, with examples, manuals and implementation tools for policy and business, and involving communities for behaviour change and skills development.</li> <li>2. Bridge research and implementation with student education and research projects.</li> <li>3. Build a community of circular economy stakeholders and offer continuity for collaborative implementation of a circular economy in Yorkshire.</li> <li>4. Support circular economy implementation by partners outside universities, through dedicated projects, awareness raising and advice.</li> <li>5. Monitor progress in circular economy practice and regularly evaluate demand for support, proactively covering gaps in circular economy capacity and avoiding duplication of efforts.</li> </ol>	<p><b>Circular Yorkshire Lab (University of Leeds)</b></p>
<p>Work with the <b>Yorkshire &amp; Humber Climate Commission</b> to identify specific interventions within the Routemap that make sense to be delivered at a wider regional level.</p>	<p><b>Y&amp;NY LEP, Yorkshire &amp; Humber Climate Commission, Local Authorities</b></p>

## 4. Developing Skills

- **Developing skills** underpins the transition to net zero and beyond to carbon negative. We need to ensure that we have the required skills in the economy to be able to implement the interventions set out in this Routemap. Whilst there will be new “green jobs” created with specific skills requirements, we also recognise that every job needs to be “greened”, as all businesses and organisations have a role to play in reaching net zero.

To ensure alignment with existing strategies, we have developed a number of priorities that sit underneath the four ambitions within the [Skills Strategy for York & North Yorkshire](#).

<p><b>Ambition 1:</b> Young people are equipped to make quality decisions about education, training and careers</p>
<ol style="list-style-type: none"> <li>1. Every school has high quality Careers information and resources to enable young people to understand what ‘green’ jobs are available in the local economy and the career and learning the pathways to get there.</li> </ol>

- |   |
|---|
| 2. Young people are informed about - and can access - high quality technical skills provision that supports their 'green' career ambitions.                         |
| 3. Skills providers are supported to embed sustainability into all areas of the curriculum, equipping learners for their future learning, careers and life choices. |

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| <b>Ambition 2: Employers can access the skills to grow highly productive and inclusive workplaces</b>   |
| 1. Adaptability, innovation and effective change management is enabled through high quality leadership and management training.                                     |
| 2. Modular training is available (e.g. Skills Bootcamps) that support local employer need for skills that enable the step-change towards net-zero.                  |
| 3. Higher level technical skills enable businesses to innovate and deliver higher value, sustainable products and services supporting our carbon negative ambition. |

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| <b>Ambition 3: Local skills providers enable businesses to respond with innovation and resilience to a dynamic economy</b>                                 |
| 1. Local Skills Improvement Planning takes account of the region's net-zero ambitions  |
| 2. Skills provision can attract high quality tutors and/or work with industry to ensure students are learning at the cutting edge of technological change. |
| 3. Skills providers can invest in high quality learning environments that support a state-of-the-art curriculum  |

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| <b>Ambition 4: Communities are empowered by learning and skills that enable everyone to participate fully in society</b>                                       |
| 1. National Skills Funding and local initiatives enable the non-economically independent to gain the skills to move into higher-paid, sustainable 'green' jobs |
| 2. An Anchor Institutions Network actively supports good work  |
| 3. There is a just transition for local communities ensuring no one is left behind in the step-change to net zero, utilising the reach of the VCSE sector.     |

There is already a significant amount of work underway. For the next draft of the Routemap, we will build upon this to establish an implementation plan to deliver on the above proposed priorities.

## 5. Programmes & Demonstrator Projects

- **Develop and deliver major programmes:** Major programmes, such as for housing retrofit, business support and energy infrastructure upgrades, are required to deliver net zero.
- **Develop and deliver demonstrator projects:** Demonstrator or pilot projects have a critical role to play in showing people the art of the possible and making net zero solutions tangible to people. This can help build confidence and inspire action.

Overarching Interventions	Lead & Partners
<p><b>Incubating small pilot projects:</b> Community First Yorkshire to have a key role in managing local pilot schemes, providing project management support and linkage to communities.</p> <p>Funding to be secured as required to enable the delivery of pilot schemes.</p>	<p><b>Community First Yorkshire</b></p>

Specific programmes and demonstrator projects are identified in the Sector Action Plans.

## 6. Infrastructure, Supply Chains & Green Industries

- **Develop infrastructure:** Ensuring that we have the infrastructure within our region to decarbonise and harness the economic opportunities from the transition. This critically includes energy and transport infrastructure, alongside resource processing infrastructure (e.g., for reverse logistics) and assets for growing regional supply chains (e.g., for bio based construction).
- **Build supply chains and green industries:** By taking a supply chain approach to grow green industries, we can lock-in the economic benefits of the net zero transition within our region. For example, by developing tree supply chains within our region, we can create new business opportunities and reduce carbon emissions from more local supply chains, as well as selling saplings to other regions.

Specific interventions around infrastructure, supply chains and green industries are identified in the Sector Action Plans.

## 7. Securing Investment

- **Attract and secure investment:** Delivering our carbon negative ambition will provide substantial investment opportunities. We must ensure a strategic and coordinated approach to investment to optimise blends of private and public sector investment, in order to unlock economic opportunities and contribute to levelling up the region.

Overarching Interventions	Lead & Partners
<p><b>As part of York and North Yorkshire’s forthcoming <i>Plan for Growth</i>, develop Investment Plans</b> to attract and optimise investment to deliver England’s first carbon negative region. Plans will set out how private sector investment will be mobilised, alongside maximising the impact of public funding.</p>	<p><b>Y&amp;NY LEP</b> Local Authorities</p>

## 8. Influencing Government Policy

- **Influence national Government policy:** York and North Yorkshire’s ambition to be net zero by 2034 and carbon negative by 2040 goes further and faster than the UK Government’s ambition to be net zero by 2050. As a result, there are a number of areas that we have identified where we need to work closely with central Government to ensure we have the policy in place to deliver on our carbon targets.

Overarching Interventions	Lead & Partners
<p><b>Work with key partners to update our policy asks as necessary and ensure where feasible that we speak with “one voice” to Government on critical issues.</b></p> <p>This will include identifying where there are significant funding gaps between national funding programmes and what’s required to deliver interventions locally (e.g., additional costs associated with retrofitting older properties). These funding gaps will be evidenced from robust findings from feasibility studies and other relevant research.</p>	<p><b>Y&amp;NY LEP, Local Authorities,</b> Yorkshire &amp; Humber Councils net zero policy workstream, Yorkshire &amp; Humber Climate Commission Policy Forums</p>

# Reducing Emissions Across the Economy: Sector Action Plans

This section includes:

- **Power**
- **Heat & Buildings**
- **Transport**
- **Business & Industry**
- **Environment -Land Use, Agriculture & Marine**

Each sector includes:

- A **vision** statement & key principles – developed from extensive stakeholder engagement;
- **“Scale of ambition”** context – based on the findings from York and North Yorkshire’s Carbon Abatement Pathways study and revised following stakeholder engagement;
- **“Why”** – rationale behind the need to decarbonise each sector, including opportunities and risks;
- **“What”** – key strategic priorities for each sector that will support the delivery of the scale of ambition;
- **“How”** – high level action plans; and
- **“Who”** - key partnerships involved in delivery.

*Note: As you move through each sector, you may notice elements have slightly different formats – this has been influenced by the engagement that we have done with different stakeholder groups to shape the sector priorities and plans. Through gathering further feedback in this consultation, we will ensure each sector has a consistent format for the next iteration of the Routemap.*



## 1. Power

### York and North Yorkshire's Vision...

*A resilient power system that provides affordable energy to all and is net zero by 2035, following the overarching principles below:*

- ❖ Use a mix of complementary technologies (e.g., co-locating renewables and storage)
- ❖ Energy generation and storage is community-led and decentralised where possible
  - ❖ Makes the most of existing landscape and infrastructure – and seeking multiple benefits where possible (e.g., flood management, biodiversity)
  - ❖ Creates high value and sustainable jobs

### Scale of ambition to achieve net zero by 2034, and carbon negative by 2040...

- **Upgrade the electricity infrastructure** to enable over double the existing demand by 2038 (up to 102% higher annual demand)
- Install an additional 1,500 megawatt (MW) of **capacity from solar, onshore wind and hydropower** by 2030 and over 2,500 MW by 2038
- Deploy a **300 MW first-of-a-kind hydrogen (H<sub>2</sub>) turbine** online by 2030, with 300 MW subsequent increase every 3 years
- **Reduce peak demand** by 10% by 2038
- **Increase installed anaerobic digestion (AD) generation capacity** by 14MW by 2030 and 16MW by 2038
- **Increase installed small bioenergy generation capacity** by 42MW by 2030 and 60MW by 2038\*
- **Deploy battery storage** to a scale of 441 MW capacity by 2030 and 736 MW capacity by 2038
- **Install Carbon Capture and Storage (CCS)** to large biomass and fossil plants, with 4 biomass turbines fitted with CCS technology at Drax by 2034, capturing 8 MtCO<sub>2</sub>/yr by 2030 and 17MtCO<sub>2</sub>/yr by 2038 (only 20% of which is attributed to region)
- **Deploy CCS retrofits onto Energy from Waste (EfW) generation** by 2030

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\*The uplift in small bioenergy generation capacity excludes anaerobic digestion, which is provided in the above AD recommendation.

## Why?

1. **Reliable and affordable power underpins economic growth**, and is critical in decarbonising the economy. Exposure to volatile energy prices demonstrates the importance of developing a strong renewable power sector to strengthen the region's energy security.
2. With **nationally significant power assets, growing low carbon technology sectors and a strong scientific innovation base**, the low carbon power transition has the potential to deliver substantial economic growth, job creation and export opportunities across the area.
3. York and North Yorkshire already has lower regional grid carbon intensity than the national average and exports most of its power to outside the region. This provides a strong foundation for us to build on. Furthermore, with relatively low existing levels of solar PV and onshore wind deployment, there is a **significant opportunity for a rapid increase in renewable energy generation in the region – providing jobs and investment opportunities**.

## What?

### Strategic Priorities for Power (2022- 2027)

1. **Increase low carbon energy generation**  
Enable, secure investment in and deliver rapid increases in capacity in low carbon energy generation (including Solar PV, onshore wind, hydropower and anaerobic digestion).
2. **Improve energy infrastructure**  
Facilitate closer working between energy suppliers, distributors and users to ensure the distribution networks are ready to enable a rapidly-decarbonising future.
3. **Accelerate Carbon Capture, Utilisation & Storage (CCUS) deployment and ensure hydrogen readiness**  
Work with existing large-scale emitters and national government to accelerate CCS deployment on power assets. Work with key industry stakeholders and national government to prepare for deploying a 300 MW first-of-a-kind H2 turbine online by 2030.

## How?

The region has been making significant progress in recent years, with active promotion of opportunities to expand low carbon energy generation and joined-up, strategic approaches to generate investment and collaborative working. Research on locally-relevant technologies and programmes has been conducted in collaboration with local authorities, energy distribution operators and renewables developers to create a unified ambition to strive for a decarbonised energy system.

### We will do this by...

Interventions	Lead & Partners
<b>Research, Planning &amp; Strategy</b>	
<b>Local Area Energy Plans:</b> regional strategic spatial plan designating future power project development; providing evidence for Northern Powergrid to make a case to Ofgem for strategic infrastructure investment; creating a portfolio of investment opportunities for developers of renewables and flexibility services. Draft plan completed by July 2022, adoption in 2023, delivery tracking annually.*	<b>Y&amp;NY LEP, Local Authorities, Northern Gas Networks, Northern Powergrid</b>
<b>Ambitious RIIO business cases and Long Term Development Plans</b> that are informed by the LAEPs, utilising data generated during LAEPs to inform robust reopeners (2023-) and future business plans (2025-)	<b>Northern Powergrid and Northern Gas Networks</b>
<b>Collaboration &amp; Innovation</b>	
<b>Cluster collaboration:</b> Encourage co-located organisations to take a collaborative approach to energy infrastructure planning and investment, and support in seeking funding and delivery options.	<b>Y&amp;NY LEP, Local Authorities</b> Business park landlords, Business improvement Districts
<b>Programmes &amp; Demonstrator Projects</b>	
<b>Energy Accelerator Programme:</b> Develop and secure funding for a programme that provides flexible wrap-around development support, funding for feasibility studies and capital grants to accelerate the development and delivery of low carbon energy projects.	<b>Y&amp;NY LEP, Local Authorities</b>
<b>Public Buildings Decarbonisation Programme:</b> develop and secure funding for a programme to support the public sector decarbonise assets. Part of the programme would be used to fund small-scale generation and flexibility technology on LA-owned land and buildings, as a commercial opportunity, and support access to complementary national funding (2023-2028).*	<b>Y&amp;NY LEP, Local Authorities</b>
<b>Community Energy North:</b> Work with the North East and Yorkshire Net Zero Hub to provide regional support to community energy projects, with the mechanism finalised by March 2023.	<b>North East &amp; Yorkshire Net Zero Hub</b> Northern Powergrid, Y&NY LEP, Local Authorities
<b>Demonstrator project: Third Energy</b> <i>A Ryedale company has switched its business model away from gas extraction and power generation to become a renewable energy company. The company's sites will now host energy storage (including batteries), solar and geothermal heat projects, with longer-term potential for green hydrogen production. Linking with local government</i>	<b>Third Energy</b> Ryedale District Council, Y&NY LEP

<i>has allowed Third to access national funding (Heat Network Delivery Unit feasibility funds).</i>	
<b>Influencing Government Policy</b>	
<b>Support for Energy from Waste (EfW) Carbon Capture and Storage (CCS):</b> work with existing EfW facilities and national government to progress CCS beyond industrial clusters, including the potential to use Allerton Park as a pilot (2022-2027)	<b>North Yorkshire County Council &amp; Amey</b> Y&NY LEP
<b>Business models for BECCS and hydrogen:</b> work with government to encourage development and deployment of business models for negative emissions technologies and hydrogen (net zero generation for power and fuels)	<b>Drax</b> Y&NY LEP, Third Energy

\*Also mentioned in Heat and Buildings Sector as the programmes have actions that cross over the sector boundaries

## Who?

Many of the organisations involved in York and North Yorkshire’s power sector are already committed to decarbonisation broadly in line with the Routemap ambition. Electricity distribution network operator **Northern Powergrid’s** Business Plan for 2023-28 ([published December 2021](#)) has a strong focus on decarbonisation. Delivery of this plan is highly dependent on **Ofgem**, the energy regulator, who will decide on whether the plan is good value for money in late 2022. Northern Powergrid intend to use the **Local Area Energy Plan** to inform their future investment pipeline, via ‘reopeners’ (opportunities to change the 2023-2028 Business Plan should strong evidence show further investment is needed) and via their next Business Plan period (from 2028).

**Large existing energy generators** in the region have plans that align with the Routemap, and smaller-scale renewable projects, often led by **communities**, are expanding rapidly. **Drax Group**, who run the biomass-powered Drax Power Plant in Selby, has the aim of becoming a [carbon negative company by 2030](#) via Biomass Energy Carbon Capture (Utilisation) and Storage (BECCS or BECCUS). They have been working closely with other **regional partners** and the **UK Government** to develop business models for carbon capture and storage, and are part of the ground-breaking **Zero Carbon Humber and East Coast Cluster CCS projects**. **Third Energy** aim to be at the forefront of North Yorkshire’s transition from fossil fuels to sustainable energy, by transforming their facilities across Ryedale into a multi-purpose energy park and research centre. Other renewables developers active in the region (e.g. **Harmony Energy, Energy Oasis**) are developing closer links with local people and local government to accelerate renewables uptake in a region where there can be significant challenges, both from infrastructure (e.g. grid capacity) and community perspectives.

These partners have all been involved in the development so far of the York & North Yorkshire Local Area Energy Plan (LAEP), either via the Steering Group or the Technical Advisory Panel. Although the governance structure is not yet finalised, it is proposed that a **LAEP Delivery Group** will be formed, to drive targeted action on the Plan and track progress – it is likely that

the majority of these organisations will be part of this group, delivering and overseeing decarbonisation of the energy system.

## 2. Heat & Buildings

### York & North Yorkshire's Vision:

*For buildings that are affordable to heat without using fossil fuels, following the overarching principles below:*

- ❖ A “whole building”, fabric first approach
- ❖ Socially equitable – ensuring lowest cost to consumers and that no one is left behind, alongside actively supporting community investment (e.g. energy co-ops)
- ❖ Maximise circular economy principles in buildings’ construction, materials and use
  - ❖ Creates long-term, high quality jobs

### Scale of ambition to achieve net zero by 2034, and carbon negative by 2040...

- **Retrofit homes** to at least an EPC C rating - 180,000 by 2030 and 250,000 by 2038
- **Retrofit public buildings** to at least an EPC C rating or above by 2027
- **Large-scale deployment of heat pumps** – 130,000-200,000 will be required by 2030, and 200,000-270,000 by 2038
- **Deploy district heating** to 10% of buildings by 2030 and over 18% of buildings by 2038
- **Install H<sub>2</sub> boilers** in between 13%-40% buildings by 2038 (dependant on gas grid deployment)
- **Eliminate oil boiler use** by 2030
- **Deploy rooftop solar PV** on 70,000 homes by 2030 and 101,00 by 2038
- **Deploy biobased construction materials** in 2,000 new homes by 2030, and 14,000 new homes by 2038

### Why?

1. **Current emissions from buildings are around 1.8MtCO<sub>2</sub>e/year, accounting for 23% of total emissions in York & North Yorkshire.** Approximately two thirds of these emissions are from domestic buildings. The **region has a higher than average proportion of properties that are not connected to the gas network (~20%),** which limits the future heating system options. Y&NY also had a large proportion of detached homes relative to the national average, which typically have a high heat demand. This is compounded by having a higher proportion of very old (pre-1919) homes that are typically less well insulated and are more challenging to retrofit. As a result, Y&NY has a high proportion of homes with poor thermal efficiency buildings – currently around 68% of homes and 62% of non-domestic properties have an EPC rating below C.

2. Consequently, the **scale of the challenge to decarbonise the region's building stock is substantial**, however, it also provides a significant opportunity to **reduce energy bills and deliver health benefits**. Improving the thermal efficiency of homes can help tackle fuel poverty and support health and wellbeing. In addition, reducing the number of fossil fuel boilers will also significantly reduce the various pollutants emitted, including nitrous oxides, which negatively impact human health. For businesses, improving the energy performance of buildings can reduce operating costs.
3. Developing **strong local supply chains that can deliver high quality building retrofits at scale provides a significant economic opportunity for the region**. As demand for retrofit grows, we need to have a supply chain that can keep up. In 2020, IPPR North research claimed that retrofitting homes across the North could provide 111,000 supply chain jobs across the UK by 2035, and boost GVA by £5.61m every year in supply chains across the UK. At a local level, research indicates that heat pump installation and energy efficiency measures alone could provide a £386m uplift in GVA by 2030 (from 2015 baseline).

## What?

### Strategic Priorities for Heat & Buildings (2022-2027)

#### 1. **Retrofit buildings at scale**

Secure investment, build supply chains and provide support to enable rapid increase in fabric-first retrofit of homes, public buildings and business premises

#### 2. **Phase out fossil fuel use**

Support the delivery of Government's ambition to start phasing out oil boilers in off-gas grid properties by 2026, and encourage accelerated delivery where possible. Use strategic planning to target technology change in the most optimal areas, incorporating heat pumps, heat networks, electric, biomass and a decarbonising gas grid as required.

#### 3. **Future-proof new buildings**

Ensure that new buildings are built to higher standards so that they will not need to be retrofitted in the short term future. Stimulate the development of a thriving, circular biobased construction sector in the region.

#### 4. **Ensure hydrogen readiness**

Work with key industry stakeholders and national government prepare for first domestic H<sub>2</sub> boiler installs in the late 2020s.

## How?

We will do this by...

Intervention	Lead & Partners
<b>Research, Strategy &amp; Planning</b>	
<b>Local Area Energy Plans:</b> regional strategic spatial plan including retrofit priority areas and heat source zoning; creating strategic approach and a portfolio of investment opportunities for heat networks; identifying rooftop solar priority areas; work with NGN to plan gas grid hydrogen rollout. Draft plan completed by July 2022, adoption in 2023, delivery tracking annually.*	<b>Y&amp;NY LEP</b> LAs, Northern Gas Networks, Northern Powergrid
<b>Local planning policy review:</b> Assess opportunities to: maximise potential to specify high standards for new builds, allow low carbon alternatives to become permitted development, and relax conservation area planning restrictions to enable retrofits on heritage buildings. This exercise should include learning from other localities that have successfully implemented robust new-build guidance above national regulatory levels.	<b>Local Authorities</b>
<b>Local Authority Heat Decarbonisation Plans:</b> Via the forthcoming support provided by the North East & Yorkshire Net Zero Hub, establish heat decarbonisation plans for local authority assets. Local Authorities will be able to apply to the programme for fully-funded heat decarbonisations plans to be undertaken. Local authorities can partner with other public sector organisations to develop plans for other public sector assets.	<b>North East &amp; Yorkshire Net Zero Hub, Y&amp;NY LEP, Local Authorities</b>
<b>Archetypal retrofit plans:</b> further research on most appropriate retrofit approaches for hard-to-decarbonise homes, building on the Hitting Hard project (UK Community Renewal Fund, complete June 2022).	<b>Local Authorities</b> Y&NY LEP, RSLs, Historic England
<b>Reuse &amp; adaptation of historic buildings:</b> Work with partners to understand how we can encourage the reuse and adaptation of heritage assets. This will include gathering knowledge and promoting examples of good practice in the adaptation of historic buildings for business, cultural and community uses to provide inspiration and practical guidance for property owners and potential buyers/tenants.	<b>Y&amp;NY LEP</b> Partners to be confirmed.
<b>Utilise learnings from “Digital Twins” project for hospitals:</b> Under the UK Community Renewal Fund programme (complete by June 2022), the York and Scarborough Teaching Hospitals NHS Foundation Trust are conducting in-depth energy futures modelling for their sites and buildings using digital twin approaches. If successful, this could be replicated across other large public estates.	<b>York &amp; Scarborough Teaching Hospitals NHS Foundation Trust</b>
<b>Communication, Engagement &amp; Movement Building</b>	
<b>One-stop-shop for energy efficiency:</b> Develop plans and secure funding to establish a sustainable regional team(s) of trusted advisors who are able to advise and support residents and businesses to seamlessly access a patchwork of retrofit support (fabric and heat source switching), making the most of national materials, UK case studies and existing local community services already in this space.	<b>Y&amp;NY LEP, Local Authorities</b> Community organisations
<b>Programmes &amp; Demonstrator Projects</b>	
<b>Public Buildings Decarbonisation Programme:</b> Develop and secure funding for a programme to support the public sector decarbonise buildings. The programme will be complementary to the UK Government’s Public Sector	<b>York and North Yorkshire LEP, Local Authorities</b>



Decarbonisation Scheme (e.g., supporting projects beyond those eligible to the Scheme)*	
<b>Low-Carbon Housing Retrofit Programme:</b> Develop and secure funding for a Y&NY housing retrofit programme to provide funding for fabric upgrades and low carbon heat sources (e.g. BEIS's Sustainable Warmth programmes, ECO, Boiler Upgrade Scheme) (2023-2028).	<b>York and North Yorkshire LEP, Local Authorities</b>
<b>Solar Together:</b> explore opportunities to develop a combined solar PV and energy storage offer for residents and businesses, working across the Net Zero Hubs to evaluate best practice and assess collaborative opportunities (2022-23).	<b>Y&amp;NY LEP</b> Net Zero Hubs, Local Authorities, Community organisations
<b>Community Buildings Decarbonisation:</b> utilise outputs of the Community Buildings Decarbonisation feasibility studies programme (UK Community Renewal Fund, complete by June 2022) to publicise opportunities for community buildings decarbonisation and build a pipeline of capital projects for which to seek capital funding.	<b>Community organisations</b> Local Authorities, Y&NY LEP
<b>Developing Skills; Developing Infrastructure, Supply Chains &amp; Green Industries</b>	
<b>Develop skills and supply chains for housing retrofit:</b> convene partners to facilitate a significant uplift in local trained installers of insulation and low carbon heat sources to increase rate of deployment, create new jobs and grow the local retrofit industry in York & North Yorkshire.	<b>FE&amp;HE</b> (Lead & partners to be identified) Y&NY LEP
<b>Grow the circular, biobased construction industry:</b> Work with partners to implement the findings of the Y&NY LEP and North East and Yorkshire Net Zero Hub jointly commissioned research to quantify the potential benefits of incorporating biobased materials, sourced from local materials and wastes, into new buildings. The report identified an action plan to exploiting the £5-15bn worth of opportunities across the North East & Yorkshire.	<b>Y&amp;NY LEP, North East &amp; Yorkshire Net Zero Hub</b>
<b>Influencing Government Policy</b>	
<b>Heat Network Zoning:</b> work with BEIS to shape heat network policy, development and deployment, including proactively seeking opportunities to take part in pilots, such as Northallerton Heat Network Zone pilot (BEIS-funded, January-September 2022)	<b>Y&amp;NY LEP</b> Local Authorities
<b>Better buildings now:</b> work with Government to create higher quality standards for new buildings, both domestic and non-domestic, to remove the need for immediate retrofit (National Planning Policy Framework Part L)	<b>Lead to be identified</b>
<b>A clear path for hydrogen:</b> lead stakeholders work with Government to develop a regulatory framework and business model for gas grid hydrogen deployment.	<b>Northern Gas Networks</b>

\*also mentioned in Power Sector as the programmes have actions that cross over the sector boundaries

## **Who?**

**Local authorities** have significant influence when it comes to new buildings, and are also taking a leadership role in retrofitting homes. However, they must be supported by **national government** and the **private sector** in order to facilitate the expansion in retrofit and heat source switching required to reach net zero.

**Public sector partners** have a key role to play in decarbonising their own estate, and acting as a catalyst for further action by amplifying messaging to their large sphere of influence (e.g. employees, visitors/customers, students). The Public Sector Decarbonisation Scheme has expanded the work being done directly by local authorities on their own estate (including successful applications from North Yorkshire County Council, Harrogate Borough Council, Hambleton District Council, Scarborough Borough Council and Yorkshire Dales National Park Authority). Hospitals and GPs in the region are covered by five different Trusts, and they all have plans to become net zero by 2050 if not before ([in line with the NHS](#)). Similarly, most of the registered social landlords operating in the region have extensive plans to decarbonise their stock, and are seeking funding via the Social Housing Decarbonisation Fund to begin to close the significant gap between ambition levels and economically-deliverable plans. The training providers on our patch are also committing to net zero targets, via a [Green & Sustainable Development AMBITION](#).

**Northern Gas Networks** are committed to working closely with local and national government, and the electricity distribution network operator **Northern Powergrid**, to create a net zero energy system that provides accessible energy to all homes and businesses, and as such are already [working to deliver a plan](#) for future gas infrastructure to facilitate rollout of low-carbon biomethane and hydrogen.

There is a patchwork of important delivery partners across this area of the economy, with different bodies responsible at varying levels for different parts of the built environment (see Appendix B for further details). In order to deliver the Routemap, each of these organisations/groups must be informed of the Routemap's targets and be confident in their role in delivery. Due to this complexity, the current table of actions focuses more closely on those groups who are closer to the public sector, but a more holistic list of commitments from existing actors in the field will be sought as the Routemap develops past its first iteration.

### 3. Transport

**York & North Yorkshire's Vision:**

***A low carbon transport system that makes it easy for individuals, businesses and other organisations to make green travel choices, following the overarching principles below:***

- ❖ Be socially equitable and inclusive - ensuring no one is excluded or feels left behind
- ❖ Be place-based - considering the different challenges and benefits of rural and urban environments, and enabling green inter-modal travel between places
- ❖ Prioritise the positive experience of the traveller (e.g., easiest, cheapest, quickest and safest) and promoting physically and mentally healthy lifestyles.

#### **Scale of ambition to achieve net zero by 2034, and carbon negative by 2040...**

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- **Reduce private car usage** by 48% by 2030
  - **Increase active travel for short journeys**, ensuring walking and cycling accounts for 17% of distance travelled by 2038:
    - Increase in walking km of 40% by 2030
    - Increase in cycling km of 900% by 2030
  - **Increase of passenger modal share by bus** to 8 % of all journeys and by train to 16% by 2030:
    - Increase in bus passengers km by 49% in 2030 and 56% by 2038
  - **Roll-out of battery electric buses**, ensuring they account for 25% of the fleet by 2030 and 95% by 2038.
  - **Roll-out of battery electric vehicles**, ensuring they account for 33% vehicles on the road by 2030, and 76% by 2038 (Battery electric vehicle sales to be in the order 20,000 per year by 2038)
  - **Van activity decreasing** by 10% with share of vehicle stock being 16% battery electric vehicles by 2030 and 55% by 2038
  - **HGV activity decreasing** by 19% with share of vehicle stock Diesel ICE decreasing from 74% in 2030 to 10% in 2038.
  - **10% of freight is shifted from heavy goods vehicles to rail**
  - **2% of van traffic is replaced by cycle freight**
  - **Sales of zero emissions heavy goods vehicles increasing** from around 250 per year in 2030 to close to 700 per year by 2038
-

## Why?

1. **Transport is the highest greenhouse gas emitting sector** in York and North Yorkshire. This is largely the result of the rural nature of the region – which brings distinct challenges to decarbonising our transport system. Across the city of York, our towns, coastal and rural areas, we need to develop sustainable transport solutions that meet the needs of communities, businesses and other organisations.
2. Creating a net zero transport system will provide a multitude of benefits that will have a **tangible impact on people’s lives and how businesses operate in our region**. The air we breathe will be cleaner, particularly in areas which are currently congested. Our health and wellbeing will benefit from it being easier to walk, cycle or run across our region. As we grow car clubs and other car sharing models, people will no longer need to own their own car and pay the associated costs. We need to ensure that active travel, public transport and shared mobility schemes are the easiest, quickest and cheapest way to travel in our region. With reduced journeys by private car, optimised logistic routes, and freight moved to rail where possible, it will be easier for businesses to move their products in our patch - reducing journey times and costs.
3. We must ensure that the movement to a net zero transport system is a **just transition** – ensuring that solutions, such as electric cars, car clubs and increased active travel – are both affordable and accessible to all. Plans will recognise different accessibility needs and ensure that places do not become inaccessible to those who identify as having a disability.

## What?

### Strategic Priorities for Transport (2022-2027)

1. **Increase active travel**  
Develop the infrastructure and support behaviour change to rapidly increase the use of ‘active travel’ for short journeys (<2km walking and 8km cycling), including planning for ‘15 minute neighbourhoods’.
2. **Decarbonise & increase use of public transport**  
Increase the use of public transport, whilst also decreasing carbon emissions through electrification and emerging hydrogen technology.
3. **Enable the shift to low carbon vehicles**  
Develop the infrastructure and support behaviour change to enable the transition to electric vehicles (EVs), micro and shared ownership / mobility schemes.

#### 4. Enable cleaner logistics

Develop the infrastructure and increase the use of low carbon freight options for the public sector, business and industry through electrification, emerging hydrogen technology, freight modal shift and local delivery logistics.

### How?

We will do this by...

Intervention	Lead & Partners
<b>Research, Strategy &amp; Planning</b>	
Development of new <b>Local Transport Plans</b> that: <ul style="list-style-type: none"> <li>- Significantly expand active travel infrastructure provision</li> <li>- Encourage development and implementation of LWCIPs, including expanding reach beyond town and city centres</li> <li>- Support the reallocation of road space to cycling, walking and public transport</li> <li>- Support electric vehicle uptake</li> </ul>	<b>Local Authorities</b>
<b>Further research understanding travel patterns:</b> Convene partners, secure funding and co-design research to better understand why people travel within our region. This would include understanding the travel needs of people living in different places in York and North Yorkshire – from upland communities to the City of York to our coastline.	<b>Y&amp;NY LEP, Local Authorities</b>
<b>Coordinated approach to increased shared mobility schemes:</b> Convene partners to share best practice from existing sharing mobility schemes, including bike sharing & car clubs (e.g., HBC and NYCC have schemes in place with Liftshare) and identify further opportunities to increase/expand offering. This will include understanding the issues and opportunities for heritage, community and cultural activation.	<b>Y&amp;NY LEP, Local Authorities</b>
<b>Explore options to deliver expanded and improved bus services</b> across the region.	<b>Local Authorities</b>
<b>Update studies of feasibility and demand</b> for passenger and freight rail services	<b>Lead &amp; partners to be identified</b>
<b>Communication, Engagement &amp; Movement Building</b>	
<b>Transport focused campaign:</b> As part of the region-wide public campaign, design and deliver a transport focused engagement campaign that targets all key stakeholders to raise awareness of green transport options and incentivise behaviour change.	<b>Local Authorities</b> Further partners to be identified.
Undertake further <b>stakeholder engagement</b> on the <b>potential to decarbonise rail</b> through a rolling programme of rail electrification where feasible, exploring and/or trialling hydrogen trains, and opportunities for additional measures such as reopening lines, improving signalling and junction improvements.	<b>Lead &amp; partners to be confirmed.</b>
<b>Collaboration &amp; Innovation</b>	
<b>Reducing need for travel &amp; supporting sustainable travel:</b> Work with key anchor institutions to assess staff and customer travel needs. Work with anchors to reduce the need for travel (where feasible and desirable) and	<b>Y&amp;NY LEP</b>

support staff/customers to choose sustainable travel options when travel is necessary.	Public & private sector anchor institutions
<b>Telematic services:</b> Provide telematics services for local fleets and small businesses to help them identify suitable zero emission options.	<b>Lead &amp; partners to be confirmed.</b>
<b>Skills; Infrastructure, Supply Chains &amp; Green Industries</b>	
<b>Assess local skills required to support rail decarbonisation.</b>	<b>Lead &amp; partners to be confirmed.</b>
<b>Programmes &amp; Demonstrator Projects</b>	
<b>Bus Fleet Decarbonisation:</b> Work with bus operators to decarbonise the bus fleet, and strategic introduction of zero emission requirements in tendered services.	<b>Local Authorities, Bus Operators</b>
<b>Public sector fleet decarbonisation:</b> utilise outputs from the UK Community Renewal Funded 'A&EV' study (complete by June 2022), to inform business cases for EV charging hubs for large sites with varied EV use (fleet plus staff and visitors), such as hospitals.	<b>Yorkshire Ambulance Service</b> NHS Trusts, Local Authorities
<b>Low carbon public transport trials:</b> Build on existing best practice and lessons learnt (e.g., YorBus, EV trials for community transport by Ryecat), develop additional trials, such as on-demand shared transport to support public transport provision.	<b>Local Authorities</b>
<b>Personal Electric Transport Hubs:</b> utilise outputs of the UK Community Renewal Funded 'Local E-motion' research and business case development (complete by June 2022), to identify further suitable personal electric mobility hubs across Y&NY, and where feasible seek delivery options for demonstrators.	<b>Local Authorities</b> Y&NY LEP
<b>Freight trials:</b> Assess feasibility and implement trials of freight modal shift, consolidation and sustainable last mile delivery (including cycle freight and electric road vehicles) for places across York and North Yorkshire. This would include exploring options for areas with existing high delivery activity and within new developments.	<b>Lead &amp; partners to be identified</b>
<b>Investment</b>	
<b>Prioritise transport funding towards enabling low carbon travel choices</b> (including maintenance of cycle routes and pavements in winter)	<b>Local Authorities</b>

## Who?

**Local authorities** have a key leadership role to play in the decarbonisation of our transport system. The development of new Local Transport Plans can unlock transformational change for an integrated net zero transport system to increase active travel, support public transport use and accelerate the shift to electric vehicles.

Through building further partnerships with the **wider public sector** and other **key anchor institutions** in the region, we can work together to co-design solutions that have scale.

Further work is required with the **private sector** to understand business supply chains and how businesses can work together to reduce emissions from freight.

Particularly for transport, we need to look wider than our region and work with neighbouring areas to support decarbonisation. This includes working with **Transport for the North** and supporting the delivery of their Transport Decarbonisation Strategy. We also need to work with **national partners**, recognising that particularly for rail, key decisions and levers to decarbonise remain at a national level.

## 4. Industry & Business

### York & North Yorkshire's Vision:

*Our businesses are thriving – realising new low carbon opportunities, saving costs through efficiency and working together to innovate, drive change and build new supply chains, following the overarching principles below:*

- ❖ Small businesses are at the heart of the net zero transition
- ❖ Businesses are equipped with the knowledge, skills and finance to enable them to realise the benefits
- ❖ Business support is designed to meet the different needs of businesses – from size, to sector to geographical location.

### Scale of ambition to achieve net zero by 2034, and carbon negative by 2040...

- **Retrofit over 62% of existing business premises by 2038**
- **Increase installation of rooftop solar** on business premises, approximately 48 Gwh each year up to 2038
- **Increase energy efficiency** of businesses to reduce energy demand by 25% by 2030
- **Increase electrification of industry**, particularly for low temperature heat and heat on smaller sites\*
- **Increase fuel switching to bioenergy**, so that bioenergy accounts for 10% of industry fuel use by 2030 and 11% by 2038
- **Increase material efficiency and circularity** of business processes and products, resulting in a 15-40% reduction in energy consumption by 2038
- **Shift short journeys of light freight to cycle and double the proportion of freight carried by rail** by 2030 (from 10% to 20%).
- **Deploy district heating** to cover between 12-22% of non-domestic heat by 2038
- **Deploy hydrogen boilers** to supply approximately 11% of non-domestic heat by 2038

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\*%s increase in electrification are highly dependent on sector and technology options



## **Why?**

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1. **Every business has a part to play in delivering net zero** and beyond to carbon negative. York and North Yorkshire's **ambitious pathway to become England's first carbon negative region will provide our businesses with distinct advantages** – from accessing new markets and saving money, to improving public perception and attracting talent. We will enable our businesses to move faster in cutting their emissions – providing the support and networks to collaborate – to create a culture of moving forward that will ensure both large and small businesses unlock the benefits of the transition to net zero.
2. **Climate change is a critical business risk.** Across the world, more extreme weather events will disrupt global supply chains, damage physical assets and increase costs of purchasing products and resources. In York and North Yorkshire, we have already experienced the impact of flooding on our businesses and communities. With an economy that is reliant on farming, food manufacturing and tourism, our economy is on the frontline of climate change impacts. Taking action now, will enable businesses to future-proof their operations and also be ready for new environmental and climate-related policy. In the long term, sustainability is good for business and will support local communities to thrive.
3. York and North Yorkshire has the **opportunity to be home to one of the UK's first large-scale hydrogen and Carbon Capture & Storage (CCS) projects**, facilitating decarbonisation of heat and industry, as well as Bio-energy with Carbon Capture and Storage (BECCS). This sits alongside unique opportunities in the bio-economy (such as bio-based construction, bio-fuels and hemp), as well as prevalent opportunities in growing local supply chains for housing retrofit, renewables and electric vehicle infrastructure.
4. As York and North Yorkshire has limited heavy industry, **SMEs will be a driving force in the transition to net zero.** SMEs face distinct challenges in lowering their emissions, particularly around having the time and funding to change how they operate. However, our SMEs are the heart of our economy – with vision, passion and far-reaching impact. Equipped with the right support, our small businesses can thrive from the transition to net zero. The journey to net zero will look different for every business and this must be recognised when support programmes are designed.

## **What?**

### **Strategic Priorities for Industry & Business (2022-2027)**

#### **1. Improve energy and resource efficiency**

Support businesses to save money through improving energy and resource efficiency of their operations.

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In practical terms, this means reducing energy bills through simple changes such as switching off lights and switching to low carbon technology, such as LED lighting. Through making processes more efficient and minimising waste, businesses can reduce costs as well as reducing their environmental impact.

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#### **2. Decarbonise heat and power supply**

Enable whole system solutions to decarbonise heat and power, including electrification, fuel switching to bioenergy, district heat networks and renewables installation.

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For businesses, options include switching to low carbon heating options and green tariffs, and exploring options to generate energy on site (such as Solar PV). This can reduce running costs, support energy security and help businesses deliver on net zero ambitions.

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#### **3. Develop cleaner logistics**

Develop infrastructure and support businesses to optimise routes, switch to low-emission fuels and renewable electricity, and where feasible move light freight to cargo bikes and heavy freight to rail transport.

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Changing how businesses move their products and materials around the region can save money through reducing fuel costs, whilst also strengthening brand reputation. Potential options will depend on the type of business and where they are located.

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#### **4. Move towards circular business models & sustainable supply chains**

Support businesses to adopt circular business models and enable the development of sustainable supply chains that are resilient to economic shocks and climate change impacts.

Moving towards a circular business model could mean:

- Minimising waste in operations AND/OR utilising waste as a feedstock
- Extending product life e.g., through designing a product to be easily maintained and repaired
- Using more sustainable materials e.g., biobased materials
- Optimising product use – e.g., using a sharing platform so that products can be used by more individuals or businesses – increasing income potential
- Recover resources – e.g., using a leasing model, establishing a return scheme and reverse logistics.

These business models can enable businesses to save costs, better meet customer needs, build their reputation as a sustainable brand and access new customers.

Developing sustainable supply chains and shortening supply chains where possible will make it easier for businesses to source materials sustainably, as well as ensuring money stays in the local economy.

## How?

We will do this by...

Intervention	Lead & Partners
<b>Research, Planning &amp; Strategy</b>	
<b>Local Area Energy Plans:</b> As detailed in the Power section, develop and implement regional strategic spatial plan to decarbonise the energy system. We will ensure that businesses have the opportunity to shape these plans, and effective implementation of the plans will ensure that businesses have the infrastructure in place to enable carbon reduction.	<b>Y&amp;NY LEP, Local Authorities, Northern Powergrid, Northern Gas Networks</b>
<b>Develop Decarbonisation Plans for Large Industrial Sites:</b> Secure funding and develop a programme of support to develop decarbonisation plans for large industrial sites. The support should include funding to carry out audits and feasibility studies. The development of the plans will be industry led, and local authorities will be lead partners for sites that they own.	<b>Y&amp;NY LEP, Businesses, Local Authorities</b>
<b>Survey Small Industry Sites:</b> survey small industry sites to understand the current technologies on all sites and applicability of low carbon options. Results will lead into refinement of LAEP and infrastructure policies, especially for hydrogen network development in late 2020s. The development of the plans will be industry led, and local authorities will be lead partners for sites that they own.	<b>Y&amp;NY LEP, Businesses, Local Authorities</b>
<b>Explore sites for early potential hydrogen use:</b> identify potential sites and undertake initial feasibility work.	<b>Lead to be identified</b>
<b>TransFIRE project:</b> as part of the TransFIRE project, we will work with local authorities and businesses to explore waste stream mapping, resource use, and opportunities for symbiosis within key industries and industrial sites.  TransFIRE (Transforming Foundation Industries Research and Innovation hub) was developed in response to the Industrial Strategy Challenge Fund (ISCF)	<b>TransFIRE Consortium</b> (led by Cranfield University, and locally by University of York)

<p>call to transform the foundation industries, namely: chemicals, cement, ceramics, glass, metals and paper. These industries produce 75% of all materials in the UK economy and are vital for the UK’s manufacturing and construction industries. Together, foundation industries are worth £52 billion to the UK economy and produce 28 million tonnes of materials per year, accounting for about 10% of the UK total CO<sub>2</sub> emissions.</p>	<p>Y&amp;NY LEP, Local Authorities, Businesses</p>
<p><b>Communication, Engagement &amp; Movement Building</b></p>	
<p><b>Develop Net Zero Business Champions</b> who will champion net zero and share best practice in their communities and networks.</p>	<p><b>Y&amp;NY LEP, FSB</b></p>
<p><b>Grow Circular Business Champions Network</b> through the Circular Communities and Towns programme, develop a network of businesses that are already demonstrating circular economy best practice and will champion CE in their communities/towns/business networks.</p>	<p><b>Y&amp;NY LEP</b></p> <p>Circular Malton CIC, CaVCa, Selby District AVS</p>
<p><b>Establish industry networks/clusters/groups</b> to lead the development of sector focused plans to reach net zero. These groups will be led by industry leaders, and also facilitate the sharing of best practice and fostering of a collaborative approach. These networks/clusters/groups would include, but not limited to, the following sectors:</p> <ul style="list-style-type: none"> <li>• Tourism</li> <li>• Food &amp; drink</li> <li>• Retail</li> </ul> <p>(This action also links to planning, strategy and collaboration)</p>	<p><b>Industry leads to be identified</b></p> <p>(University of York Management School to support food &amp; drink group)</p>
<p><b>Collaboration &amp; Innovation</b></p>	
<p><b>BioYorkshire:</b> Led by the University of York, Askham Bryan College and Fera Science, the project will harness scientific expertise to develop biobased supplies of fuel, chemicals and materials. The project will also support net-zero food production, farming and wider land use practices.</p> <p>The project aims to:</p> <ol style="list-style-type: none"> <li>1. Create over 4,000 highly skilled jobs</li> <li>2. Reduce CO<sub>2</sub> emissions by 2.8 million tonnes per year for the UK</li> <li>3. Reduce UK waste to landfill by 1.2 million tonnes per year</li> <li>4. Generate £1.4bn to the UK economy</li> </ol> <p>The initiative comprises three key elements:</p> <ol style="list-style-type: none"> <li>1. <b>BioYorkshire Innovation &amp; Skills Central</b> will comprise a suite of world-leading science infrastructure and training for bioeconomy entrepreneurs and innovators.</li> <li>2. <b>BioYorkshire District Incubator Hubs</b> across York and North Yorkshire to link local green economy start-ups and business scale-ups with the facilities and training at Innovation Central. The hubs will foster cross-fertilisation of knowledge and innovation across sectors.</li> <li>3. <b>The BioYorkshire Accelerator</b> will provide advice, expertise, networks and promotional opportunities for businesses across the region, accelerating the deployment of green economy innovations from development to commercialisation.</li> </ol>	<p><b>University of York, Askham Bryan College &amp; Fera Science</b></p> <p>Local Authorities</p>
<p><b>Work with national and regional partners to support innovation in the following specific areas:</b></p> <ul style="list-style-type: none"> <li>• <b>Power innovation:</b> storage technologies (hydrogen, ammonia, compression, chemical flow), demand side response, hydrogen electricity generation, CO<sub>2</sub> capture &amp; utilisation.</li> </ul>	<p>Lead &amp; partners to be confirmed.</p> <p>Y&amp;NY LEP</p>

<ul style="list-style-type: none"> <li>• <b>Industrial innovation:</b> industrial technologies to reduce carbon emissions.</li> </ul>	
<b>Infrastructure, Supply Chains &amp; Green Industries</b>	
<p><b>Develop material processing, recycling &amp; reverse logistics infrastructure:</b> Research and coordinate schemes to increase industrial recycling, especially closed loop recycling for glass, plastics and aggregates. Working with industry partners and local authorities to explore the potential for reverse logistics to reduce resource use in line with the proposed Deposit Return Schemes and Extended Producer Responsibility policies.</p>	<p><b>Local Authorities, Y&amp;NY LEP, other partners to be confirmed.</b></p>
<p><b>Sustainable public procurement:</b> Y&amp;NY local authorities and other public sector organisations to strengthen procurement policy to support net zero ambitions. This will include incorporating sustainability criteria in tender evaluations, as well as implementing the recently developed low carbon procurement toolkits for:</p> <ol style="list-style-type: none"> <li>1) Services – including catering, furniture, ICT hardware, transport and vehicles;</li> <li>2) Built environment – including new build, maintenance, refurbishment and highways.</li> </ol>	<p><b>Local Authorities &amp; other public sector partners</b></p>
<p><b>Develop SME supply chains:</b> Linked to the SME Net Zero Programme, provide support for Y&amp;NY SMEs to become more sustainable so that they are able to meet the public sector’s increasing sustainability standards.</p>	<p><b>Y&amp;NY LEP, Local Authorities</b></p>
<b>Programmes &amp; Demonstrator Projects</b>	
<p><b>SME Net Zero Programme:</b> Develop, secure funding and deliver a package of measures to support SMEs on their journeys to become net zero (including support to become more energy and resource efficient; fuel switching to electricity, hydrogen &amp; bioenergy; shortening supply chains). The programme will be co-designed with business intermediaries &amp; SMEs to ensure that it is fit for purpose, recognising that businesses have different needs (as a result of their size, rural – urban location, sector and stage of their net zero journey).</p>	<p><b>Y&amp;NY LEP</b> (Growth Hub &amp; net zero design group)</p> <p>Y&amp;NY Local Authorities, FSB</p>
<p><b>UoY Sustainability Action Plan Project:</b> Student volunteers from UoY will help local organisations, businesses or charities to kickstart actions to improve their environmental sustainability. Teams will be trained to use the Net Positive Futures Social impact tool as a starting point, and the organisation and the team will identify areas where they already have good practises and where improvements can be made. Students then undertake research into other local sustainability initiatives and find examples of carbon cutting actions to present back as an action plan for the charity, and also share these with the other teams to build up a database of actions.</p>	<p><b>University of York</b></p>
<b>Influencing National Policy</b>	
<p>Working with partners, engage with the central government to inform and direct national policies on specific issues, including:</p> <ul style="list-style-type: none"> <li>• Support early <b>deployment of Carbon Capture Utilisation &amp; Storage (CCUS) infrastructure</b> in Yorkshire &amp; Humber</li> <li>• Develop business models and financial incentives for <b>industrial fuel switching</b></li> <li>• Research/evidence gathering on <b>hydrogen and electrification technologies for industry</b></li> <li>• Additional investment from Ofgem for <b>infrastructure upgrades</b> in the region.</li> <li>• Implementation of <b>national green procurement guidelines</b></li> </ul>	<p><b>Y&amp;NY LEP</b> Yorkshire &amp; Humber Councils net zero carbon sub-group; Yorkshire &amp; Humber Climate Commission</p> <p>SME specific areas: FSB</p>

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|---|--|
| <ul style="list-style-type: none"><li>• Stricter <b>industrial emissions regulations and carbon intensity targets/trajectories</b></li><li>• Ensuring national <b>net zero policy and support programmes are designed for SMEs</b></li><li>• <b>Funding for SMEs</b> to pilot innovative circular business models</li></ul> |  |
|---|--|

## Who?

To reach, engage and activate the diversity of businesses within our region, **business intermediaries**, such as the Federation of Small Businesses, West and North Yorkshire Chamber of Commerce, and **industry groups** will be critical. Y&NY LEP's **Growth Hub** and **local authorities** will also have key roles to play in terms of supporting the design of business programmes and engaging local businesses.

An important part of our approach is unlocking collaboration and peer-to-peer working through **developing networks** and **clusters**. This will enable businesses to share best practice, develop collaborative projects and solve collective challenges. This is expected to build capacity and capabilities of businesses.

We will seek to take a **supply chain approach** where possible to mobilise different actors to move in the same direction, and ensure they are able to realise new business opportunities from the transition to net zero.

We will work collaboratively with regional partners, such as the **North East & Yorkshire Net Zero Hub** and **Yorkshire & Humber Climate Commission**, to share lessons learnt and develop programmes at scale where a wider regional approach is appropriate.

## 5. Environment – Land Use, Agriculture & Marine

### York & North Yorkshire's Vision:

*Our region is working together to restore, enhance and protect our unique rural, marine and coastal environments, following the overarching principles below:*

- ❖ A bottom-up, flexible approach that empowers farmers to make their own decisions and ensures no farmers are left behind
- ❖ Support more resilient farm businesses (e.g., income diversification, “marketable products”)
  - ❖ Ensure that food production is central to the approach
- ❖ Maintain and strengthen ecological diversity for positive environmental impacts overall (e.g. avoid monocultures, support changes that benefit nature and landscapes)

### Scale of ambition to achieve net zero by 2034, and carbon negative by 2040...

- Plant **37,000 hectares of new woodland** by 2038
  - Increase amount of **hedgerows in the region by 20%** by 2038, alongside improvements in hedgerow width and health
  - 100% of upland and lowland **peatlands under restoration** by 2038
  - **Improve manure management**
  - Decarbonisation of **on-farm machinery**
  - Increase **bioenergy crops to reach over 5,000 hectares** by 2038
  - Achieve **30% reduction in food waste** by 2030
- 

### Why?

1. **Land and marine are critical natural assets.** They provide us with the fundamentals of life: food, clean water, timber, and the natural regulation of hazards such as flooding. Key to the effective functioning of these is biodiversity. They also inherently sequester and store carbon so are essential resources to mitigate climate change. With a **distinctive coastline, two National Parks, three Areas of Outstanding Natural Beauty** and over 70% of our geography being used for agriculture, we are uniquely positioned to use our natural assets support the delivery of net zero, improve biodiversity and level up our national economy.
2. **Natural capital directly supports 11% of our GVA**, with the opportunity for natural capital related GVA to grow by 31% by 2050. If we fail to increase investment in our natural capital, we **risk continued degradation of our natural capital** – resulting in a 5% loss in

the sector's GVA, and an increase in greenhouse gas (GHG) emissions owing to our region's high proportion of degraded peatlands, which will continue to emit carbon unless they are restored.

3. Due to the rural nature of our region and high dependency on natural capital, **we are on the frontline of increasingly frequent weather extremes and other climate change impacts**. Flood risk damage and disruption creates substantial costs for our residents and businesses; drought risks and heat waves cause significant disruption to agriculture and wider industries; and we are at risk from increased fires, especially on the upland moors, which could increase air pollution and significantly affect our tourism industry. Meanwhile some biodiversity losses may be irreversible.

## **What?**

### **Strategic Priorities for Land Use, Agriculture & Marine (2022 – 2027)**

#### **1. Improve productivity to reduce emissions**

Improving productivity and efficiency will enable farmers to produce the same quantity of food (or more) with fewer inputs, in smarter ways and reduce greenhouse gas emissions.

##### **a. Reduce emissions in the food supply chain**

Build partnerships to support the development of local, sustainable food supply chains that reduce waste. Review procurement procedures to consider using seasonal, locally available produce first and support the regional economy. Support and communicate best practice in regenerative farming techniques.

##### **b. Increase efficiency through farm innovation**

Supporting the decarbonisation of farm machinery and working with partners to promote Electric Vehicle charging points in rural locations to assist the transition to low carbon transport. Support partnerships that develop inward investment in Agri-tech and accelerate growth of clean-tech, digital and circular economy business models.

##### **c. Improvements in rivers and streams**

Supporting engagement with the farmers, landowners, and riparian owners who are directly connected to the rivers and the catchments that surround them; providing advice and best practice for protecting regenerating landscapes.

##### **d. Investment in technology and best practice**

Support delivery of capital investment programmes to implement new technologies or infrastructure that improve productivity (such as renewables, anaerobic digestion or improved slurry/manure management projects).

#### **2. Increase storage of carbon in our landscapes**

By conserving and changing land management and land use we can capture more carbon – in soils, hedgerows and trees add maintain and strengthen ecological diversity.

##### **a. Managing tree planting and hedgerows**



Support partnerships, build local supply chains and ensure a strategic approach to increase planting of trees. Recognise the importance of trees outside woodlands. Promote new markets for locally produced timber and wood fuel. Work with farmers to ensure the right trees are planted and promote good management of existing tree stocks

**b. Restore upland and lowland peatlands**

Support partnerships to restore upland and lowland peatlands – improving biodiversity, managing flooding and providing clean water.

**c. Increase regenerative agriculture**

Working with partners and programmes to promote regenerative agriculture to improve soils and capture carbon. Promote the market for bio-based products working with partners to scale-up opportunities and balance supply and demand in the supply chain providing confidence for investment

**3. Enhance marine and coastal ecosystems to improve carbon sequestration**

**a. Carbon storage in marine & coastal habitats (phase 1)**

Explore the potential of carbon storage in specific marine and coastal habitats

**b. Enhance, manage and protect habitats (phase 2)**

Develop partnerships and programmes to enhance, manage and protect marine and coastal habitats (phase 2)

**c. Support sustainable fisheries**

Develop partnerships and programmes to support and develop long-term sustainable fisheries.

**How?**

We will deliver the strategic priorities by developing and supporting partnership working and promote strategic policies for clean growth in the rural economy. We will collaborate with key stakeholders to deliver support and develop funding opportunities to assist landowners, farmers and rural businesses to plan, innovate and deliver a net zero future. Working with partners we will enable every farm to become carbon negative by providing support and enabling a “whole farm” approach to greenhouse gas emissions that improves farm productivity, resilience and biodiversity - including improving soil health, improving manure management and decarbonising machinery.

**We will do this by...**

Intervention	Lead & Partners
<b>Research, Planning &amp; Strategy</b>	
<p><b>Local Nature Recovery Strategy:</b> Local Nature Recovery Strategies are a new, England-wide system of spatial strategies that will establish priorities and map proposals for specific actions to drive nature’s recovery and provide wider environmental benefits.</p>	<p><b>To be confirmed.</b></p>

<p><b>Natural Capital Investment Plan:</b> Secure funding to develop a Natural Capital Investment Plan for York and North Yorkshire.</p> <p>The overarching aim of the Natural Capital Investment Plan (NCIP) is to ensure a strategic and coordinated approach to investment in natural capital across York and North Yorkshire. This will enable the region to respond to climate change, and unlock the economic opportunities of becoming England’s first carbon-negative region. The Plan will directly contribute to delivering Government’s priorities around net zero, nature recovery and levelling-up. The <b>specific objectives</b> of the Natural Capital Investment Plan are:</p> <ol style="list-style-type: none"> <li>1. <b>To attract and optimise investment</b> in YNY’s natural capital, leveraging private sector investment to maximise the impact of public funding</li> <li>2. <b>To improve biodiversity, soil health and access to the outdoors</b> to support nature recovery, carbon sequestration, economic resilience and human wellbeing.</li> <li>3. <b>To provide a long-term, strategic approach</b> to land-use change to ensure competing pressures are fully understood and addressed</li> <li>4. <b>To drive collaboration</b> within and beyond the region to build capacity, ensure alignment and enable change at pace and scale</li> <li>5. <b>To empower land owners and land managers</b> to shape the region’s future.</li> </ol>	<p><b>Y&amp;NY LEP</b> Local Nature Partnership, National Parks, Local Authorities</p>
<p><b>Developing a natural capital approach for our marine &amp; coastal environment:</b> On the Yorkshire coast, we are starting to develop our understanding of the wide-ranging services provided to us by the marine ecosystem. Working with our partners across the region, we are exploring how a marine natural capital accounting system might work, and how it could link with a terrestrial system. We have started this process by reviewing the work carried out so far, identifying current gaps in knowledge and highlighting the different aspects of marine natural capital on the Yorkshire coast.</p>	<p><b>Yorkshire Marine Nature Partnership</b></p>
<p><b>Net Zero Food Hub</b> - To build an inclusive and dynamic network of interdisciplinary researchers, businesses, government, and civil society, able to co-design and deliver innovative research that improves decision-making around Net Zero Agri-Food Systems.</p>	<p><b>University of York</b> Grow Yorkshire</p>
<p><b>Research into impact of loss of local Abattoirs in Protected Landscapes,</b> the impact on local supply chains, communities and animal welfare</p>	<p><b>To be confirmed</b> North York Moors National Park, Howardian Hills AONB</p>
<p><b>Biomass Biodiversity</b> – further research to explore links between nature conservation and anaerobic digestion feedstocks</p>	<p><b>North Yorkshire &amp; York Local Nature Partnership</b> Natural England, Biorenewables Development Centre, NYCC</p>
<p><b>Collaboration &amp; Innovation</b></p>	
<p><b>Delivery of FixOurFood Programme (~2026):</b></p> <ul style="list-style-type: none"> <li>• <b>Regenerative Farming</b> (Research area 1) Yorkshire contains 13-17% of the UK’s crop production area (for cereals, oilseed rape, potatoes, field vegetables and glasshouse production), with 10-14% of the UK’s livestock headcount (cattle, sheep and poultry). The variety of farming systems</li> </ul>	<p><b>University of York</b> University of Leeds, City of York Council, University of Oxford, Cranfield</p>

<p>within the region and the diversity of soil and land cover combined with networks of innovative farmers, makes it an excellent test bed for more regenerative approaches.</p> <ul style="list-style-type: none"> <li>• <b>Hybrid Business Models</b> (production, supply, consumption) (Research area 2) The Yorkshire region incorporates diverse elements of food production, supply and consumption. It has the highest concentration of food and drink businesses in the UK and our aim is to improve their social and environmental impact.</li> <li>• <b>Sustainable &amp; Healthy Food</b> (Research area 3) Yorkshire is ethnically diverse with significant social and economic deprivation and ill health. Many areas show some of the worst income deprivation statistics affecting children in England.</li> </ul>	<p>University , Spark York, Grow Yorkshire, Food Foundation (and others)</p>
<p><b>Facilitating collaboration to support community woodland projects:</b> Bring together key partners involved in community woodland projects to share best practice and bring forward further projects.</p>	<p><b>Local Authorities,</b> LNP, White Rose Forest, Yorkshire Dales Millennium Trust</p>
<p><b>Hemp-30 Project</b> aims to increase the amount of industrial hemp 100-fold in the UK seeking to establish industrial hemp as a major UK crop. The project will draw on the University’s world-leading expertise in molecular plant breeding technology to fast track improvement of hemp traits to meet the needs of developing markets. Researchers will target traits such as biomass yield, fibre quality and drought resistance to produce varieties of hemp that are best suited to UK growing conditions</p>	<p><b>University of York</b></p>
<p><b>Support Yorkshire Marine Nature Partnership:</b> Continue to support the Yorkshire Marine Nature Partnership (YMNP) which brings people together to share expertise, skills and local knowledge for the benefit of our important marine and coastal environment. The Partnership will have a key role to play in enabling collaborating and building capacity to increase the ability of marine and coastal ecosystems to sequester carbon.</p>	<p><b>Yorkshire Marine Nature Partnership,</b> Y&amp;NY LEP</p>
<p><b>Programmes &amp; Demonstrator Projects</b></p>	
<p><b>Farming in Protected Landscapes (FiPL):</b> Create case studies and utilise lessons learnt from the current FiPL programme to shape future policy and programmes.</p>	<p><b>Grow Yorkshire, Yorkshire Dales National Park Authority, North York Moors National Park Authority, AONBs</b></p>
<p><b>Farm Carbon Audits:</b> Secure funding to build on the successful pilot of 14 upland farm to roll-out a wider programme of farm carbon audits. In the initial pilot, one farm is now producing certified ‘carbon neutral beef’, which has proved a catalyst for big changes to their upland farming system.</p>	<p><b>Lead to be confirmed.</b> Yorkshire Dales National Park Authority, Nidderdale AONB, Yorkshire Water, Grow Yorkshire</p>
<p><b>White Rose Forest:</b> Delivery of the White Rose Action Plan 2021-25 – which sets targets for tree planting and woodland creation across North and West Yorkshire over the next four years. Seven million trees, the equivalent of 4900 football pitches or 3500 hectares, could be planted in North and West</p>	<p><b>White Rose Forest,</b> North Yorkshire County Council, City of York</p>

<p>Yorkshire between 2021 and 2025, with the support of landowners and farmers, with funding from the Government’s Nature for Climate fund.  <b>Wider partners will support</b> collaboration with tree and woodland planting opportunities e.g. Government’s Nature for Climate Fund.</p>	<p>Council, Harrogate Borough Council, Craven District Council, Forestry Commission, National Trust</p>
<p><b>Upland peat restoration programme:</b> Coordinated by the Yorkshire Peat Partnership, continue collaborative work to restore upland peat. Between November 2020 and March 2021 the Yorkshire Peat Partnership completed 36,574 ha* of peat restoration work which is 38% of the estimated 95,796 ha* of blanket bog in Yorkshire (*this is defined as upland management units containing peat).          Future projects include:</p> <ul style="list-style-type: none"> <li>• The Yorkshire Peat Partnership received £4.8 million from Natural England’s Nature for Climate fund. Combined with match funding from Yorkshire Water and a private landowner, it will enable a £6.5 million leap forward in peatland restoration in the northern uplands delivering a major restoration and monitoring programme across 3,510 a of peatland in the Yorkshire Dales and North York Moors National Parks and the Nidderdale and North Pennines Areas of Outstanding Natural Beauty.</li> <li>• Funding from Innovate UK’s Knowledge Transfer Programme and VP plc will allow YPP to find an answer to major recurring issue with sloping, bare peat facing into the prevailing wind. Whatever is done to revegetate it, southwest facing bare peat is scoured by the wind and requires multiple interventions. Working with the University of Manchester, YPP hope to find techniques and materials that will address this challenge and consolidate the integrity of restoration work on these sites.</li> <li>• The National Lottery Heritage Fund funded ‘Tees-Swale: naturally connected’ programme was launched in February; two of the most outstanding landscapes in the English uplands are set to be connected, restored and enhanced in one of the most significant nature programmes to be funded in the UK. YPP will be leading all of the programme’s peatland restoration work in Swaledale.</li> </ul>	<p><b>Yorkshire Peat Partnership</b> Local Nature Partnership, Yorkshire Water, Natural England, NYMNPA, YDNPA, Environment Agency Nidderdale AONB, NFU</p>
<p><b>Lowland peat restoration project</b> – the key challenge is to develop, with partners, an action plan working with the Yorkshire Wildlife Trust to secure funding to trial a package of measures to support farmers restore lowland peatland, including:</p> <ul style="list-style-type: none"> <li>• Farm carbon audits – to establish initial carbon baselines and recommend key measures to reduce emissions and sequester carbon on farms.</li> <li>• Exploratory engagement &amp; research – working with farmers to understand how lowland peat can be restored, without compromising farm productivity.</li> <li>• Paludiculture* pilots – working with BioYorkshire, explore the potential of innovative paludiculture approaches to re-wet peatlands, but still be highly productive for farming. (*Paludiculture is the practice of farming on wet land)</li> </ul>	<p><b>Yorkshire Wildlife Trust</b>, NFU, CLA, Yorkshire Dales National Park, Nidderdale AONB, Yorkshire Water</p>
<p><b>Skell Valley Scheme:</b> The National Trust and <a href="#">Nidderdale Area of Outstanding Natural Beauty (AONB)</a> are the lead partners of sixteen organisations who</p>	<p><b>National Trust &amp; Nidderdale AONB</b></p>

<p>have come together to deliver the Skell Valley scheme, which will create a sustainable future for the Skell Valley.</p> <p>£2.5m has been secured to deliver a programme of projects that will ensure:</p> <ul style="list-style-type: none"> <li>• Landscape is resilient - We'll help tackle the threats of climate change and ensure we play our part in a 'green' recovery following the COVID-19 pandemic- making the landscape, its people and the local economy more resilient</li> <li>• Nature Thrives - We'll reverse the decline in nature, conserve ancient trees and woodlands and the wildlife they support and create nature-rich spaces where people live.</li> <li>• People are empowered - We'll empower people to deliver projects for nature, heritage and landscape by supporting them in learning the skills they need and removing current barriers that stop people accessing the outdoors and nature around them.</li> <li>• Heritage is celebrated - We'll save our heritage from the threats of climate change and general neglect and create new and exciting opportunities for people to explore the nature and history of the Skell Valley and be involved in its care.</li> </ul> <p>Key learnings from the project will be utilised to shape future policy and actions within the Routemap.</p>	
<p><b>Vertical, urban farm pilot.</b> As part of FixOurFood, the project is developing an urban vertical farm (Grow It York): investigating how such a farm can improve the environmental impact of local food businesses and have social impact on the local community. Lessons learnt from the pilot will be used to explore the potential for a network of vertical urban farms across the region.</p>	<p><b>Make it York</b> Spark, University of York (FixOurFood)</p>
<p><b>Concrete Coast Project:</b> made possible by the Water Environment Improvement Fund (WEIF), the project will explore options for improving the ecological value of artificial structures along our coastline. The project will look at how we can encourage wildlife back to artificial shorelines through simple and cost-effective methods, without changing the function or integrity of man-made coastal structures. In the long-term, this will increase biodiversity and provide more opportunities for coastal wildlife.</p>	<p><b>Yorkshire Marine Nature Partnership,</b> Environment Agency, East Riding of Yorkshire Council, Scarborough Borough Council, University of Hull</p>
<p><b>Infrastructure, Supply Chains &amp; Green Industries</b></p>	
<p><b>Yorkshire Tree Supply Chain project</b> – mapping the end-to-end stakeholders associated with tree planting and management to understand the potential to grow the supply chain within the region.</p>	<p><b>North Yorkshire County Council</b> University of Huddersfield, Grow Yorkshire, White Rose Forest</p>
<p>Creation of a <b>Yorkshire Hemp Special Interest Group</b> to drive growing and use of industrial hemp. The Group will build upon the findings and recommendations from the Yorkshire Hemp Supply Chain research project – which mapped the stakeholders, existing supply chains and potential for growth.</p>	<p><b>Biorenewables Development Centre</b> Grow Yorkshire, University of York, Clarion Solicitors</p>
<p><b>Dynamic Purchasing Platform.</b> To develop a platform to shorten food supply chains and connect SME food producers to public sector procurement</p>	<p><b>Lead to be confirmed</b></p>

	Crown Commercial Service, University of York, Deliciouslyorkshire, Grow Yorkshire, Springfield Agri
<b>Influencing Government Policy</b>	
<b>Environmental Land Management Scheme (ELMs):</b> We will engage with DEFRA to explore a mechanism to identify and support funding applications from York and North Yorkshire which align to the strategic priorities set out in the Routemap. This would enable us to gain insights into projects and which programmes are delivering these.	<b>Grow Yorkshire, YFFRN &amp; partners</b>

## Who?

Below are groups and organisations that have been identified to support and deliver the strategic priorities for land use, agriculture and marine as outlined.

<b>1. Improving Productivity to reduce emissions:</b>	
<b>Partner Organisations</b>	<b>Supporting Strategies</b>
NFU	<a href="#">Achieving Net Zero - Farming's 2040 goal</a>
CLA	<a href="#">The Net Zero Transition</a>
Yorkshire Dales National Park	<a href="#">National Park Management Plan 2019-2024</a>
North York Moors National Park	<a href="#">Management Plan (Draft)</a>
Howardian Hills AONB	<a href="#">Howardian Hills Management Plan 2019-2024</a>
Nidderdale AONB	<a href="#">Management Plan 2019-2024</a>
FixOurFood Programme (University of Leeds, City of York Council, University of Oxford, Cranfield, Spark York, Grow Yorkshire, The Food Foundation, Deliciouslyorkshire (and others))	<a href="#">Programme Overview</a>
NY&Y Local Nature Partnership	<a href="#">Local Nature Partnership Strategy</a>
Yorkshire Agricultural Society (Future Farmers of Yorkshire, Farm Scientist Network, Yorkshire Food, Farming & Rural Network)	
<b>2. Storing of carbon in the landscape:</b>	
<b>Partner Organisations</b>	<b>Supporting Strategies</b>
NFA	<a href="#">Achieving Net Zero - Farming's 2040 goal</a>
CLA	<a href="#">The Net Zero Transition</a>
White Rose Forest	<a href="#">National Park Management Plan 2019-2024</a>
Yorkshire Dales National Park	<a href="#">Management Plan (Draft)</a>
North York Moors National Park	<a href="#">Howardian Hills Management Plan 2019-2024</a>
Howardian Hills AONB	<a href="#">Management Plan 2019-2024</a>
Nidderdale AONB	<a href="#">Achieving Net Zero - Farming's 2040 goal</a>
NY&Y Local Nature Partnership	<a href="#">Local Nature Partnership Strategy</a>
Fera Science	
Yorkshire Peat Partnership (managed - Yorkshire Wildlife Trust)	
The Rivers Trust	
Yorkshire Water	<a href="#">Yorkshire Water Carbon Strategy</a>
Biorenewables Development Centre	
BioYorkshire (University of York)	

Yorkshire Agricultural Society (Future Farmers of Yorkshire, Farm Scientist Network, Yorkshire Food, Farming & Rural Network)	
FixOurFood Programme (University of Leeds, City of York Council, University of Oxford, Cranfield, Grow Yorkshire, (and others))	<a href="#">Programme Overview</a>
<b>3. Enhance marine and coastal ecosystems to improve carbon sequestration</b>	
<b>Partner Organisations</b>	<b>Aligned Strategies</b>
Yorkshire Marine Nature Partnership	<a href="#">NE Inshore &amp; Offshore Marine Plan 2016-2021</a> <a href="#">Flamborough Head Marine Management Plan</a>
North York Moors National Park	<a href="#">North York Moors Coast Management Plan</a>

# **Governance, Performance Monitoring & Reporting**



## Governance, Performance Monitoring & Reporting

### Governance Model

Over the next 6 months, we will be developing a governance model to ensure the effective implementation of York and North Yorkshire's Routemap to Carbon Negative. Where possible, we will seek to utilise existing governance structures to support the embedding of net zero and avoid duplication. It is important to note that York and North Yorkshire is currently in a period of transition, with local government reorganisation underway in North Yorkshire, and York and North Yorkshire commencing discussions with Government around a devolution deal for the area. As a result, governance arrangements are likely to evolve over the next two years.

The governance model will need to reflect the multitude of partners that need to be involved to deliver this Routemap, and be designed to ensure swift decision making to enable the Routemap to be a living document.

### Performance Monitoring & Reporting

After incorporating the feedback from the Consultation, we will be developing more detailed implementation plans for the specific areas outlined in the Routemap. As part of these implementation plans, key milestones, success criteria and risks registers will be developed to enable performance to be tracked against the interventions set out in the Routemap. This will also allow us to measure progress delivering the Routemap's strategic priorities.

We will also establish a mechanism to measure reductions in York and North Yorkshire's carbon emissions, and assess whether they are falling at a rate to deliver our ambition to be net zero by 2034. This is likely to involve repeating the emissions modelling that was carried out in the Carbon Abatement Pathways study.

In the next iteration of the Routemap, key delivery risks will be identified and mitigation strategies developed. Key strategic risks include reliance on national Government policy and high delivery costs for low carbon technologies. These risks will be monitored as part of the performance monitoring approach.

Aligned with the governance structure, we will ensure regular reporting to appropriate boards, partnerships and groups. We will publish a report annually on progress made delivering the Routemap, alongside any changes made to priorities, approaches or action plans.

## Appendix A – Summary of key studies that form the evidence base of York and North Yorkshire’s Routemap to Carbon Negative

The Routemap has drawn on a number of cross-sector studies:

### 1. Tyndall Centre Study: A carbon budget for York, North & West Yorkshire

Based on analysis by the Tyndall Centre, the study recommended that for York, North Yorkshire and West Yorkshire to make its ‘fair’ contribution towards the Paris Climate Change Agreement, we need to:

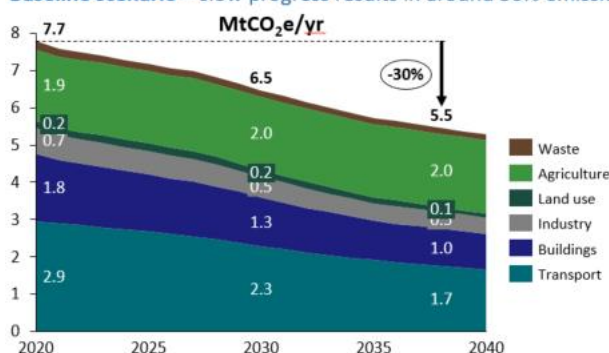
- Stay within a cumulative carbon dioxide emissions budget of between 91 and 107 million tonnes (MtCO<sub>2</sub>), depending upon the allocation of the budget, for the period of 2020 to 2100. At 2016 CO<sub>2</sub> emission levels, the region would use this entire budget within 5 to 6 years.
- Initiate an immediate programme of CO<sub>2</sub> mitigation to deliver annual cuts in emissions averaging 13% to 15% - depending on allocation method - to deliver a Paris aligned carbon budget. These annual reductions in emissions require national and local action, and would be part of a wider collaboration across local authorities.
- Reach zero carbon no later than 2041.

### 2. York & North Yorkshire Carbon Abatement Pathways Study (Element Energy)

The research focused on:

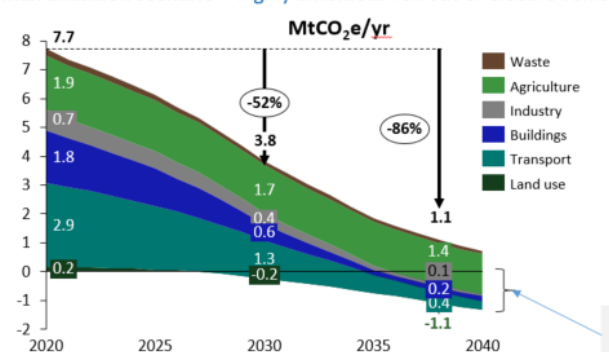
- Developing technically robust emissions reductions pathways, to enable the region to meet proposed net zero emission reduction targets.
- Identifying key milestones, decision points, policies and interventions that can drive the transition toward these outcomes, including timeframes of actions and roles of stakeholders in delivering actions.

**Baseline scenario – slow progress results in around 30% emissions reduction by 2038**



- This graph shows the region’s emissions projection under the baseline scenario, divided into the contribution from each of the sectors. The numbers on the graph show the emissions in 2020, 2030 and 2038 for each sector and the total.
- The baseline scenario sees a 30% reduction in emissions by 2038, with 5.5 MtCO<sub>2</sub>e/yr remaining in 2038.
- All sectors see slow change due to lack of strong incentives for consumers and businesses to switch to low carbon heat, transport and other practices.

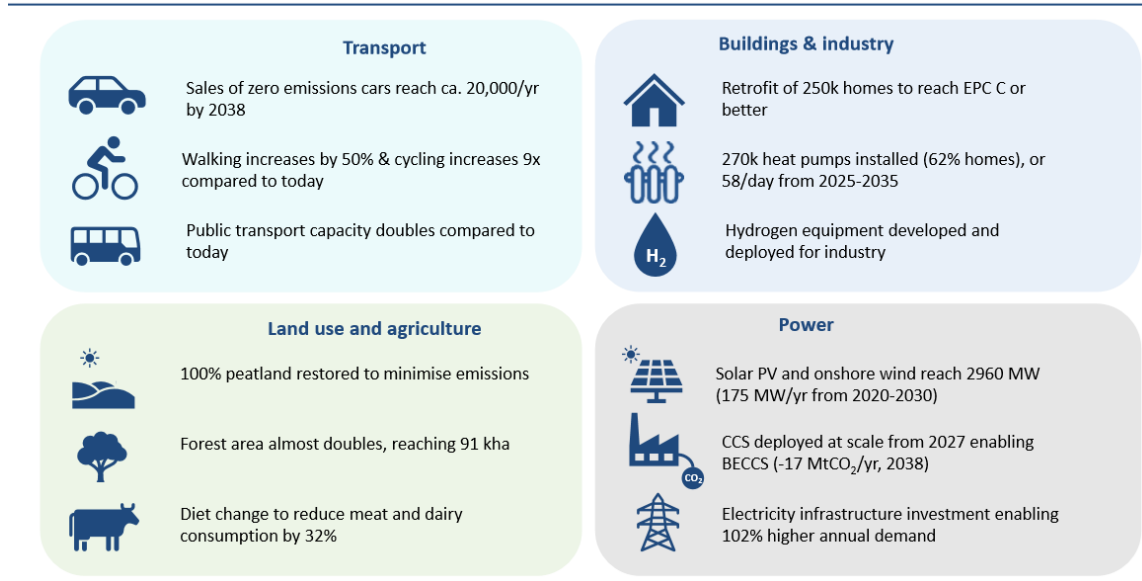
**Max ambition scenario – highly ambitious roll out of electric vehicles, active travel, heat pumps & tree planting makes rapid progress**



- This graph shows the region’s emissions projection under the Max ambition scenario, divided into the contribution from each of the sectors.
- The scenario sees an 86% reduction in emissions by 2038, with 1.1 MtCO<sub>2</sub>e/yr remaining in 2038. When BECCS negative emissions from Drax are included, the region reaches net zero in 2034 and by 2038 is considerably net negative (see later).
- All sectors see rapid change, requiring strong incentives for consumers and businesses to switch to low carbon heat, transport and other practices.

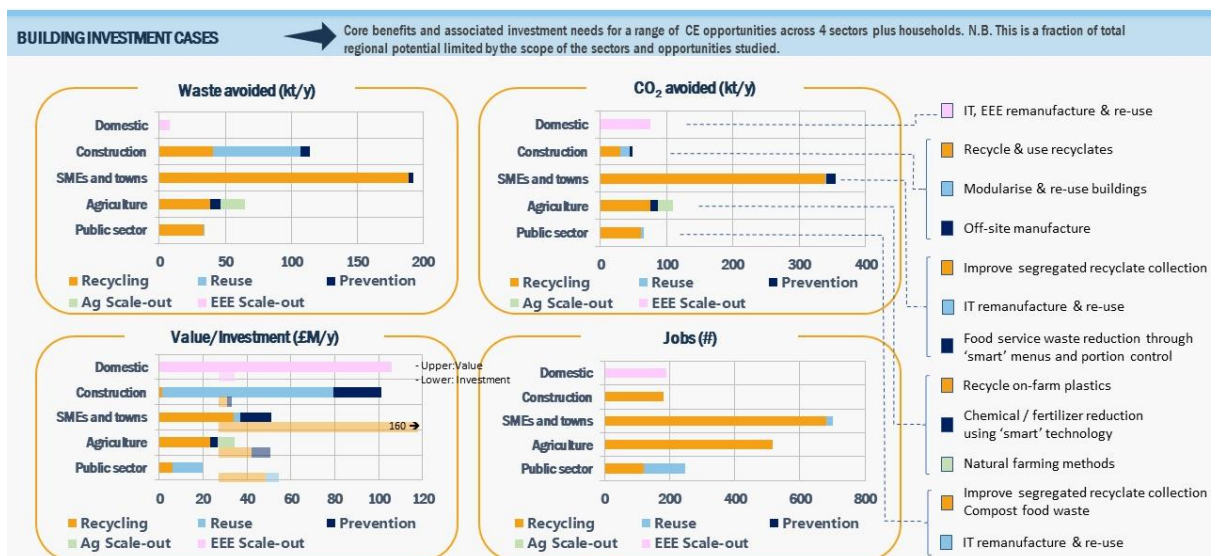
Land use emissions are negative, offsetting some residual emissions in other sectors

The research recommended that to get to net zero by 2034, the region would need to have achieved the following by 2038:



### 3. Circular Economy Investment Case Research (Oakdene Hollins)

At a high level, it is estimated that the benefits of moving towards a circular economy equate to a potential value of £3 billion per year in York and North Yorkshire. Across 15 specific opportunities evaluated, the research estimated CO<sub>2</sub>e savings of 650 kt/y, value generated of over £300m/y and the permanent creation of over 1,800 jobs. Accompanying investment was around £240m in total.



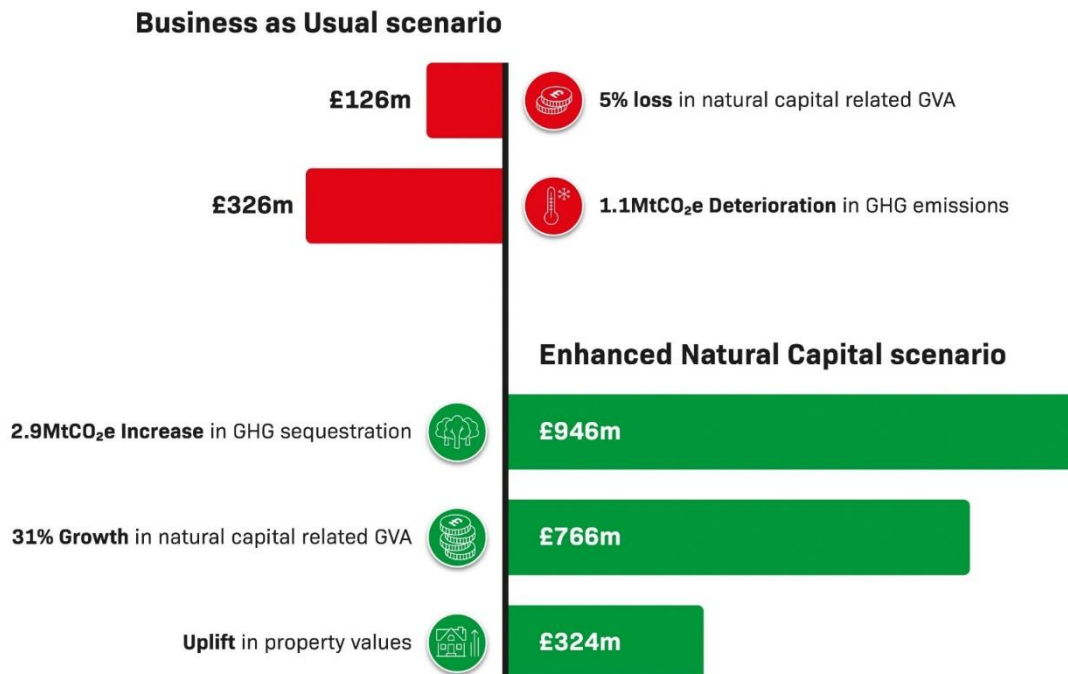
#### 4. Natural Capital Study (Eftec)

The aim of the study was to understand the importance of natural capital to the economy of York and North Yorkshire, in order to identify how natural capital assets can be used sustainably to support economic performance and improve productivity.

The study found that:

- Natural capital directly supports 11% of our GVA , with the opportunity for natural capital related GVA to grow by 31% by 2050.
- If we fail to increase investment in our natural capital, we risk continued degradation of our natural capital – resulting in a 5% loss in the sector’s GVA, and an increase in greenhouse gas (GHG) emissions owing to our region’s high proportion of degraded peatlands, which will continue to emit carbon unless they are restored.
- Due to the rural nature of our region and high dependency on natural capital, we are on the frontline of increasingly frequent weather extremes and other climate change impacts.
- By investing in our natural capital, we could sequester an additional 2.9MtCO<sub>2</sub>e.

#### Change in economic impact by scenario (by 2050) for York and North Yorkshire



Source: York & North Yorkshire and West Yorkshire Natural Capital Study (2020)

### 5. **Low Carbon and the Circular Economy: An Assessment of Skills Supply and Demand**

Delivering York and North Yorkshire's carbon negative ambition will require major transitions and depend on having the right type, level and volume of skills in place. The research advanced understanding of what skills businesses require to deliver a low carbon, circular economy; how far education and training providers are delivering these; and what barriers and solutions exist to enhancing future delivery.

While low carbon and circular economy transition are relevant to all sectors, we focused on four sectors where the speed and scale of transition will be critical to achieving net zero goals: energy and engineering; construction (and related roles/trades); automotive; and digital skills (as an enabler).

The research sets out key recommendations to overcome existing barriers and ensure the region has the skills required for the transition to net zero, and beyond.

### 6. **Celebrating our Distinctive Heritage**

'Celebrating our Distinctive Heritage', a report jointly commissioned by Historic England and York & North Yorkshire LEP, builds a better understanding of the historic environments of York, North Yorkshire and the East Riding and highlights wide-ranging opportunities for good economic growth. Launched at the beginning of September 2021, the report acts as a call to action for thinking and acting differently with regards to heritage. The study provides a number of recommendations, many of which link to the region's carbon negative ambition:

**1. The scale of the opportunity is huge:** The sheer numbers and diversity of our historic sites, and the quality of the environments in which they are located, creates opportunities for good growth throughout the area. Heritage assets have the potential to support sustainable economic reuse, and there are ample opportunities that creative approaches could unlock.

**2. Thinking and acting differently is imperative:** The Coronavirus pandemic has provided a range of stark lessons on the resilience, potential – and vulnerabilities – of the region's historic places. We must learn from them; adapting to the needs of the 21st century and the challenges we will face, not least in terms of decarbonisation and adapting to the effects of climate change.

**3. People, places and the economy benefit from a well-maintained historic environment:** The strength of the synergies between improving quality of place, quality of life and economic development, and looking after our heritage is striking. Conservation and adaptation of historic buildings has major benefits in terms of sustainability, can contribute to regenerating town centres and can help unlock local economic opportunities.

**4. York, North Yorkshire and the East Riding – strong and distinctive brands:** The area is well known as a historic part of the country, and is renowned for its environmental quality. This is an excellent hook from which to hang marketing and promotion at a variety of scales.

**5. Value of diversity:** While the region has many places with similar origin stories, they retain clear and distinct characters – informed by local geology, industries and buildings styles. This diversity of place is an important strength which can add value to specific and complementary economic and experiential offers.

A number of sector specific studies have also informed the Routemap, including:

**7. Circular Biobased Construction in the North East & Yorkshire (Arup & Material Cultures)**

The research found that the North East and Yorkshire has much of the existing agricultural and industrial infrastructure required to make the shift from carbon-intensive to biobased construction, as well as a wealth of knowledge and skills in the private sector. The potential benefits include:

- Carbon reduction: using biobased materials to build the homes required in the North East and Yorkshire over the next 17 years could save up to 2.88 megatonnes of CO<sub>2</sub>.
- Economic growth: a shift from current supply chains and methods to regionally grown and processed biobased construction could generate up to £1.9 billion.
- Improving human wellbeing: building with biobased materials can reduce indoor air pollutants, making constructions safer and improving air quality within buildings.

**8. Yorkshire Hemp Supply Chain (Promar)**

Hemp has an efficient carbon sequestration structure resulting in its ability to successfully capture and store atmospheric carbon dioxide, with the ability to store up to 22 tonnes of carbon per hectare. This study focused on mapping the existing supply chain for hemp and analysing its potential growth. The study found that the hemp supply chain in Yorkshire operates well despite its small scale. However, gaps in the chain in regard to collaboration and technical manufacturing facilities means that there are areas of improvement that can be made to further strengthen the sector. The research concluded that there is significant opportunity for Yorkshire to capitalise on the growing demand for hemp globally.

**Appendix B: Existing groups and their level of involvement and influence in decarbonising the built environment.**

	Existing buildings		New buildings	
	Domestic	Non-domestic	Domestic	Non-domestic
<b>Y&amp;NY Registered Providers Group</b>	<i>Specifically social housing</i>		<i>Specifically social housing</i>	
<b>Y&amp;NY Housing Board</b>			<i>Regional strategic oversight</i>	
<b>York Housing Energy Efficiency Board</b>	<i>Specifically City of York</i>			
<b>Local Authority (LA) Planning departments</b>	<i>Local oversight of retrofit applications (structural changes/ conservation area)</i>	<i>Local oversight of retrofit applications (structural changes/ conservation area)</i>	<i>Local oversight of individual applications</i>	<i>Local oversight of individual applications</i>
<b>Local Plan teams</b>			<i>Local strategic planning</i>	<i>Local strategic planning</i>
<b>LA Home Improvement teams</b>	<i>Track record, focussed on fuel poor</i>			
<b>LA economic development teams</b>		<i>Some influence, no explicit role</i>		<i>Some influence, no explicit role</i>