

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

5 July 2022

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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), over 70% of our geography being used for agriculture and unique marine and coastal assets, 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. This ensures that we are taking a holistic approach and delivering benefits beyond carbon reduction 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, Green Industries & Supply Chains; 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.

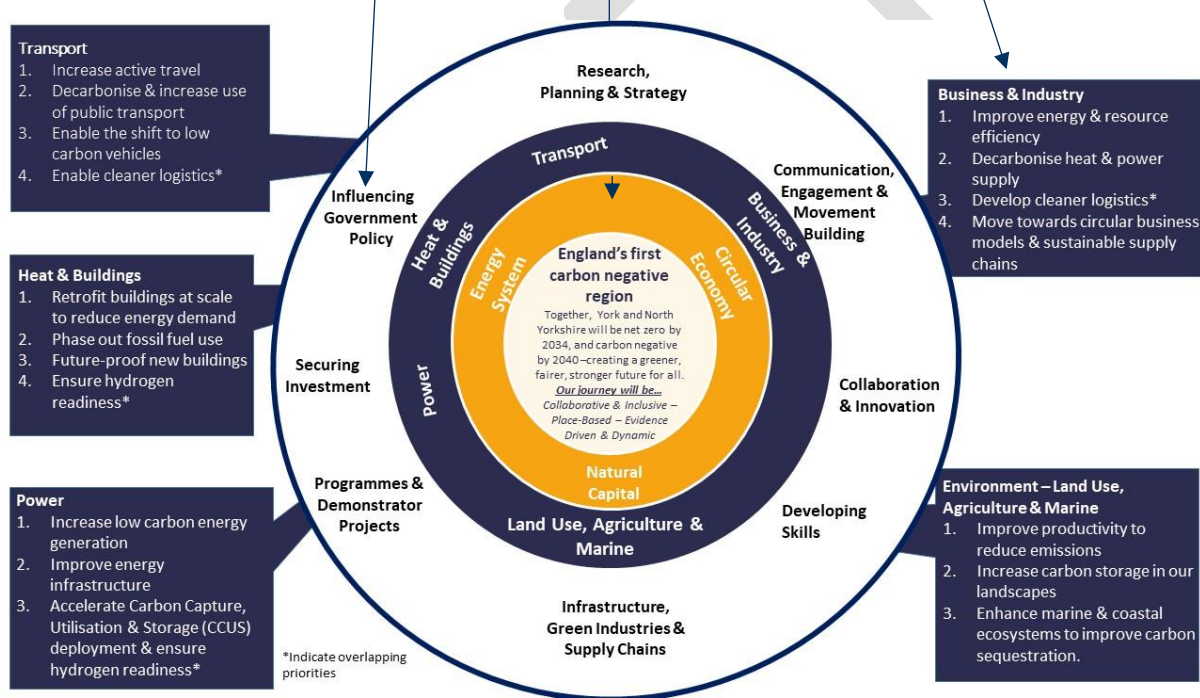
The specific objectives of the Routemap are:

- 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?

The Routemap sets out a long term direction of travel, but focuses on priorities and actions between 2022 and 2027. This is because we are still awaiting key decisions at a national level which will impact our pathway to net zero in the late 2020s and beyond.

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.

“DELAYING ACTION WOULD ONLY SERVE TO PUT FUTURE GENERATIONS AT RISK OF CROSSING CRITICAL THRESHOLDS RESULTING IN SEVERE AND IRREVERSIBLE CHANGES TO THE PLANET, THE ENVIRONMENT, AND HUMAN SOCIETY.”

UK GOVERNMENT NET ZERO STRATEGY
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. With our distinctive coastline, we are also innovating to enhance our marine and coastal ecosystems to sequester carbon, and realising economic opportunities in aquaculture. We also have Drax power station on our

patch, with their pioneering greenhouse gas removal technology - Bioenergy with Carbon Capture and Storage (BECCS). As a leader in decarbonisation, we can harness the economic opportunities of the transition, creating jobs and attracting investment to our region.



KEY SECTOR OPPORTUNITIES
INCLUDE:

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

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. The decoupling of economic activity from environmental damage, will strengthen our economy and provide **new opportunities** for businesses, such as those indicated to the left.

5. Early action will also enable us to **maximise the co-benefits of net zero** for people living in and visiting the region. 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**. Communities have a key leadership role in the delivery of net zero. Whilst a coordinated approach across the region is needed, delivery will ensure communities are able to lead a “hyper-local” approach to net zero.
6. We can also use the transition to **reverse the decline of nature** and tackle the **biodiversity crisis**. The Routemap sets out how we will **enhance our natural capital** and utilise **nature based solutions** where possible.
7. 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, attracting investment and reversing the decline of our natural environment. **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

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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 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**.

[Case studies capturing a range of best practice projects will be included in the designed-up version]

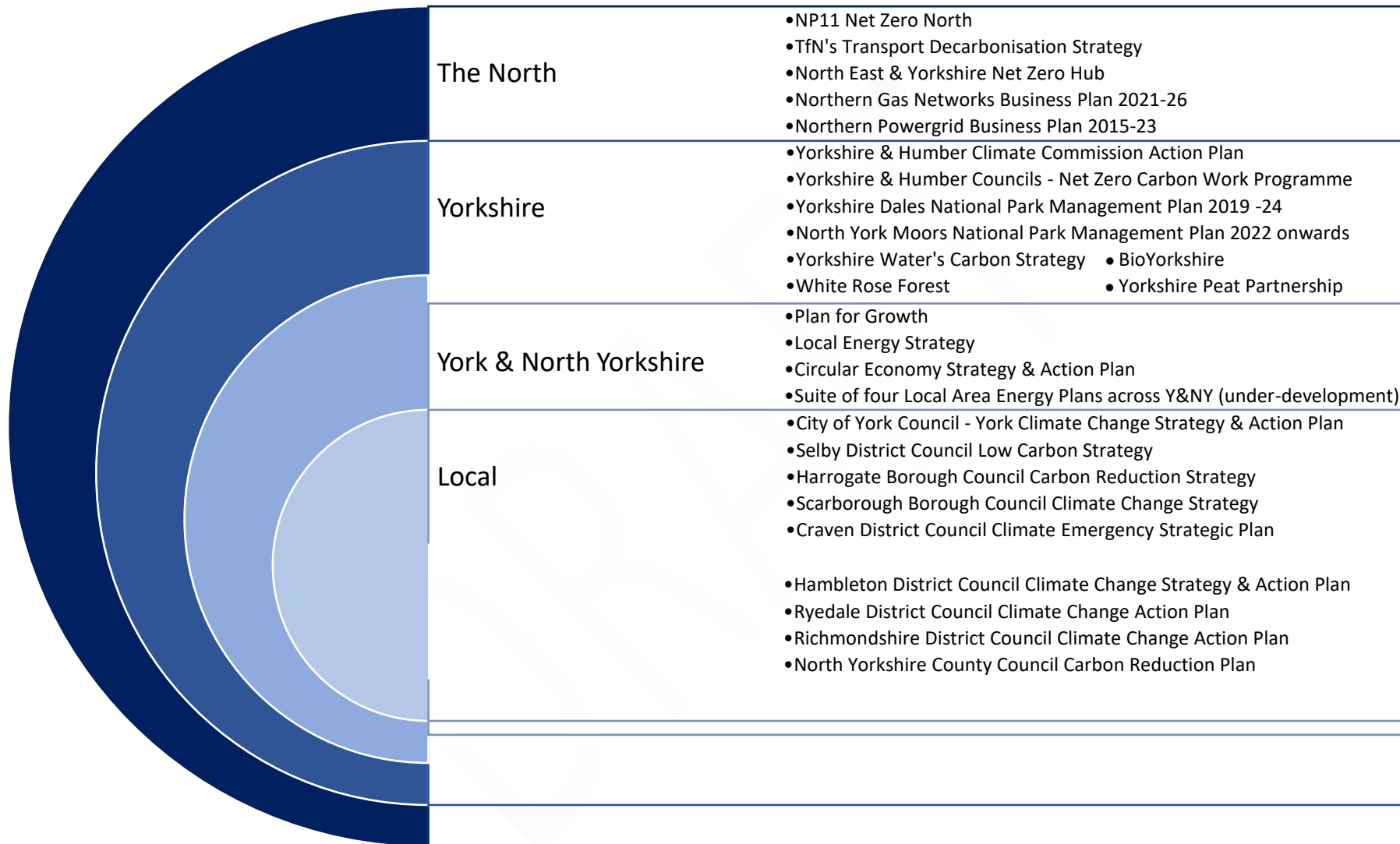


Figure 1. Climate Action Landscape

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, the York and North Yorkshire LEP commissioned a **study to understand potential pathways to get to net zero** across high-emitting 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 next 6 months, the team engaged with key stakeholders, partnerships and boards to **develop strategic priorities and interventions for each sector**.
- Between 28th February and 17th March 2022, we undertook an **open consultation** to gather feedback on the first draft of the Routemap, with a specific focus on the “strategic priorities” and “action plans”. Responses were reviewed, and the LEP team produced a suite of summary reports outlining key themes from the consultation and how feedback has been addressed. As part of addressing the feedback, we also held a number of **workshop sessions** to address key issues around business & industry, marine and coastal, tourism, community climate action and land use & agriculture. The consultation and further workshop sessions informed the final draft of the Routemap.

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. This is 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:

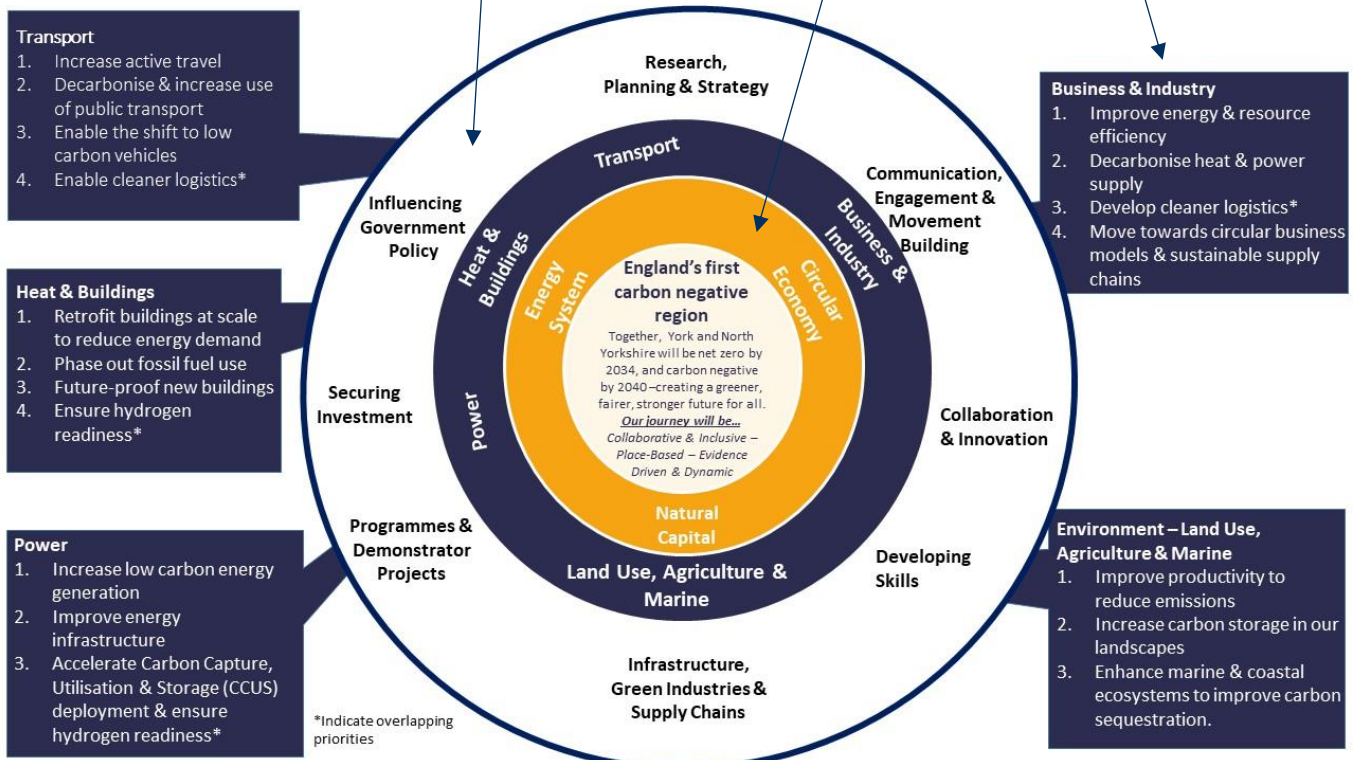
- **Be the only decarbonisation plan in the region.** The Routemap will help coordinate action and build a golden thread between business, local authority, regional and national net zero strategies.
- **Provide all the solutions to reach net zero and beyond.** Gaps in policy, investment, local capacity 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. As part of our approach, we are committed to working with the Yorkshire & Humber Climate Commission on the work they are leading around climate change adaptation.

Routemap Strategic Framework

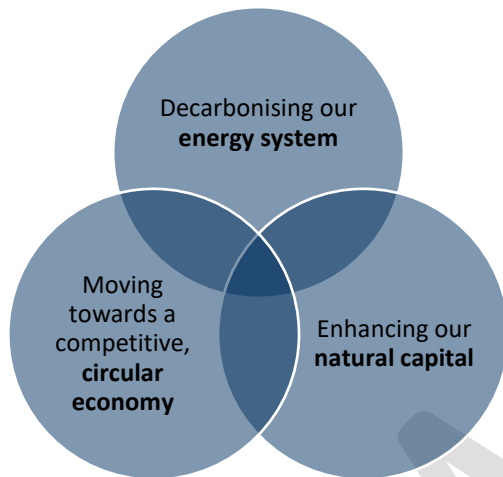
Building on an extensive evidence base and working closely with stakeholders, our framework sets out our approach to delivering England’s first carbon negative region.

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 system¹. We will deliver systems solutions to decarbonise power, heat and buildings, and transport.



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 emissions². We don’t yet have a baseline for the region’s Scope 3 emissions, but we expect the emissions that occur outside Y&NY’s boundary as a result of activities taking place within the region to be substantial (including

carbon emissions associated with low carbon technology, such as low carbon heating systems and electric vehicles). The circular economy can help tackle these scope 3 emissions, as well as reduce waste and improve resource efficiency within the region.

Enhancing our Natural Capital: through investing in our natural assets, research estimates that we can sequester up to 2.9MtCO₂e³. 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. These nature based solutions can provide benefits beyond carbon sequestration – including providing cleaner air and water, improving biodiversity and supporting economic resilience.

¹ Element Energy (2021) York and North Yorkshire Carbon Abatement Pathways Study

²Scope 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.

³ 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 embed a climate justice approach to address the inequitable distribution of climate change impacts, alongside responsibilities to tackle climate change. We will work together to ensure that no community or organisation is left behind.

- **Place-based**

Our approach will protect and build upon York and North Yorkshire's 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, Green Industries & Supply Chains**
- **Securing Investment**
- **Influencing Government Policy**

Enabling Transformation across the Economy: Creating Systems Change

Introduction

Creating a thriving carbon negative region requires changing how our “systems” operate – from our homes and local communities, to our businesses and other organisations, to our transport, energy or food systems. 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.

It must be recognised that “Business as Usual” and incremental changes will not be enough to reach our ambitious net zero target of 2034. Drawing on **systems thinking** and **change management principles**, we will achieve the vast scale of change set out in this document.

This will deliver transformational benefits that 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 York and North Yorkshire to decarbonise at pace and scale:

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

These enablers are inter-related and intrinsic to each other, with all elements required to achieve systemic change. An important outcome of delivering these enablers is behaviour change – through making it easy for people and organisations to take steps to reduce their carbon footprint. We will regularly review the enablers and associated actions to track progress and ensure that they remain impactful and relevant.

This section explains what we mean by each of the enablers, and details overarching priorities and actions that are relevant across sectors. Actions have been prioritised based on urgency (in line with the Carbon Abatement Pathways study) and feasibility of mobilising resources and funding.

Prioritisation of actions is indicated using the following colour code:

Immediate Actions: Actions that are either already underway or will commence before the end of March 2023 (FY22-23)	Short-term Actions: Actions that will commence in between April 2023 – March 2024 (FY23-24)	Medium-term Actions: Actions that will commence after April 2024

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 whereby best practice is shared. 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
Share key net zero research with stakeholders via the Y&NY LEP website and newsletters. [Underway]	Y&NY LEP Drax, TechBuyer
Facilitate a local research community for academics, private sector and public sector to share net zero related research and also areas where new research is needed. [Planning underway]	University of York
Refine and implement Local Area Energy Plans. The development of a suite of four Local Area Energy Plans (LAEPs) is underway to provide York and North Yorkshire with strategic spatial plans for a fully decarbonised energy system. Draft plans will be completed by October 2022 and adopted in 2023, with implementation to be 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. [Underway]	Y&NY LEP, Local Authorities, Northern Powergrid, Northern Gas Networks TfN, Drax
Develop Local Plans that support and enable the delivery of net zero (climate change mitigation), as well as supporting climate change adaptation.	Local Authorities
Local Planning Policy Review: 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. This will include reviewing planning policy to ensure new developments are future-proofed, as well as changes to support the development of a circular economy (E.g., to enable reverse logistics and establishing critical infrastructure).	Local Authorities, National Park Authorities
York and North Yorkshire Heritage and Culture Strategy Group: 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	Y&NY LEP, Historic England, Arts Council England, National

<p>report and drive forward selected recommendations based on impact and deliverability, providing strategic oversight and enhancing the delivery of place-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).</p>	<p>Lottery Heritage Fund, National Park Authorities</p>
<p>Develop a circular economy framework and work programme for Yorkshire & Humber. 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 work programme will support collaboration and engaging a wide-range of stakeholders. [Underway]</p>	<p>Yorkshire & Humber Councils (net zero carbon sub group) Yorkshire Circular Lab, North East & Yorkshire Net Zero Hub, NHS, National Park Authorities, Drax & other private sector partners.</p>

2. Communication, Engagement & Movement Building

- Effectively communicate and engage stakeholders:** Getting people and organisations actively engaged and being part of the journey to carbon negative is absolutely critical. 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:** As a region, we want to go beyond developing buy-in from people, and provide the conditions for organisations, communities and individuals to have a leadership role in taking climate action. To tackle the climate crisis and achieve our carbon negative ambition, we need a critical mass of people to be engaged, empowered and working together to take action. This includes within communities, businesses and other organisations to develop low carbon projects and embed net zero across all functions of an organisation, or parts of a community.

This enabler is critical to supporting behaviour change – making individuals and organisations aware of the changes that they can make, as well as empowering them to take action.

Overarching Interventions	Lead & Partners
<p>Translation of community and sector priorities and interventions into infographic summaries for targeted audiences. These will enable different organisations and communities to clearly see their role in delivering York and North Yorkshire’s carbon negative ambition and the benefits of being</p>	<p>Y&NY LEP Drax</p>

involved. Research and engagement will be undertaken to ensure the right language is used to appeal to specific audiences. [To be completed by end of March 2023]	
Region-wide public facing campaigns 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. Campaigns will have clear messaging and 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. This will ensure a “local feel”. 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. [2023 – onwards]	Local Authorities, National Park Authorities, Community First Yorkshire Additional partners to be identified
Engagement with young people: Learn from work underway to engage young people in climate action, including NYCC’s engagement with youth forums, CYC’s youth engagement and the University of York-led FixOurFood programme. Facilitate synergies between youth engagement work and utilise learning to further develop Routemap actions. [2023 – onwards]	Local Authorities, University of York, Y&NY LEP
Circular Yorkshire Week: Bring together a wide range of partners to co-design and co-deliver an annual campaign to raise awareness of the circular economy, inspire action and enable collaboration. [2023 – onwards]	Y&NY LEP YorWaste, Biorenewables Development Centre (BDC), University of York, FSB, Cooper King Distillery, SeaGrown, Local Authorities (+others)
Empower community climate action: Building on Community First Yorkshire’s Climate Change Toolkit , collaboratively develop a package of measures to: <ol style="list-style-type: none"> 1. Increase awareness and understanding of climate change – including impacts, solutions and the benefits of taking action 2. Enable and support communities and community organisations to achieve their own objectives and projects 3. Listen and learn from community initiatives 4. Facilitate partnership working between communities/community organisations and other organisations to deliver shared objectives. The package of support will recognise that communities across Y&NY will have different opportunities, challenges and starting points to reach net zero. The support will cover key thematic areas, including active travel, community energy, reuse & repair, food and behaviour change. Support will include a range of measures from resources and guides to rural energy roadshows to engaging young people and developing community climate champions. [2023 – onwards]	Community First Yorkshire, Local Authorities, National Park Authorities

<p>Establish a Circular Towns and Communities Network: 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. [Underway]</p>	<p>Y&NY LEP</p> <p>Circular Malton CIC, Coast & Vale Community Action, Selby District AVS, Local Authorities, Community First Yorkshire</p>
<p>Building capacity for net zero across key anchor institutions: Facilitate a cross-sector network for key anchors in the region in order to develop synergies, and increase capacity and capabilities to develop and deliver net zero projects. [2023 – onwards]</p>	<p>Lead to be confirmed. Partners to include the University of York & Drax.</p>

3. Collaboration & Innovation

- **Enable collaboration:** Delivering on our carbon negative ambition will require unprecedented collaboration. We need to bring different people and organisations together to co-create and deliver change. There is strong consensus within the region that collaboration is key and a commitment to work together.
- **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>BioYorkshire: 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. The project aims to:</p> <ol style="list-style-type: none"> 1. Create over 4,000 highly skilled jobs 2. Reduce CO₂ emissions by 2.8 million tonnes per year for the UK 3. Reduce UK waste to landfill by 1.2 million tonnes per year 4. Generate £1.4bn to the UK economy <p>The initiative comprises three key elements:</p> <ol style="list-style-type: none"> 1. BioYorkshire Innovation & Skills Central will comprise a suite of world-leading science infrastructure and training for bioeconomy entrepreneurs and innovators. 2. BioYorkshire District Incubator Hubs 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 	<p>University of York, Askham Bryan College & Fera Science</p> <p>Local Authorities</p>

<p>will foster cross-fertilisation of knowledge and innovation across sectors.</p> <p>3. The BioYorkshire Accelerator will provide advice, expertise, networks and promotional opportunities for businesses across the region, accelerating the deployment of green economy innovations from development to commercialisation. [Underway]</p>	
<p>The Yorkshire Circular Lab 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"> 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. 2. Bridge research and implementation with student education and research projects. 3. Build a community of circular economy stakeholders and offer continuity for collaborative implementation of a circular economy in Yorkshire. 4. Support circular economy implementation by partners outside universities, through dedicated projects, awareness raising and advice. 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. [Underway] 	<p>Circular Yorkshire Lab (University of Leeds)</p>
<p>Convene and enable collaboration between York and North Yorkshire Local Authorities and localities. The Local Authority Climate Action Coordinator will support:</p> <ol style="list-style-type: none"> 1. Strategic coordination and supporting wider regional work – understanding what scale climate action interventions are required and connecting the dots between activities. 2. Engaging and activating SMEs – working in partnership to develop a package of measures to support SMEs in YNY to decarbonise. 3. Developing supply chains and skills – connecting businesses with higher education and skills providers to build the supply chains for housing retrofit, EV installation/maintenance and renewables. 4. Driving collaboration – continue to convene YNY LAs to support collaboration and sharing best practice, and enable wider partnership working with anchor institutions. [Underway] 	<p>Y&NY LEP, Local Authorities</p>
<p>Coordinate & Amplify Community Climate Action: Programme of work to map existing community groups, increase partnership working and enable community groups to shape regional strategic initiatives:</p> <ul style="list-style-type: none"> • Build on existing mapping work to map out community environmental / climate action groups and projects. • Clear identification of roles and responsibilities across LAs and community groups, and how they can best work together. • LAs to help with reaching out to different communities, groups and local organisations to listen to their plans, views and experiences. LAs to help ensure that grassroots actions are fed into the ongoing development of the Routemap. 	<p>Community Groups, Local Authorities Yorkshire Circular Lab, Community First Yorkshire</p>

<ul style="list-style-type: none"> Work with partners to identify requirements and create an action plan to support building capacity and opportunities for joint-working. [2023 onwards] 		
<p>Making data and information available: Support innovation by making local data and information available to enable partnerships to develop innovative solutions and services. [2023 onwards]</p>	<p>Local Authorities, Y&NY LEP, Drax, TfN, Northern Powergrid</p>	
<p>Work with the Yorkshire & Humber Climate Commission to identify specific interventions within the Routemap that make sense to be delivered at a wider regional level. [To be completed by end of 2022]</p>	<p>Y&NY LEP, Yorkshire & Humber Climate Commission, Local Authorities Drax</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](#). Working with partners, the LEP team are underway with developing a full implementation plan for developing low carbon skills. Example actions are indicated in the Table below.

<p>Ambition 1: Young people are equipped to make quality decisions about education, training and careers</p>
<p>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.</p> <ul style="list-style-type: none"> York and North Yorkshire Careers Hub provide information for young people, on career paths to ‘green’ jobs, through the delivery of labour market intelligence sessions to careers leaders. York and North Yorkshire Careers Hub work with cornerstone employers in priority/growth sectors to deliver programmes of engagement through Enterprise Co-ordinators
<p>2. Young people are informed about - and can access - high quality technical skills provision that supports their ‘green’ career ambitions.</p> <ul style="list-style-type: none"> York and North Yorkshire Careers Hub raises awareness of technical and vocational qualifications including apprenticeships, T Levels and Traineeships through the ASK package to careers leaders and through employer engagement.

3. Skills providers are supported to embed sustainability into all areas of the curriculum, equipping learners for their future learning, careers and life choices.
 - Yorkshire Learning Providers in partnership with Craven College and Y&NYLEP have developed The Green Skills and Sustainable Development Ambition to aid Further Education and skills organisations to green up estates, integrate green issues within the curriculum and equip apprentices to be agents of change for the transition to a low carbon economy.

Ambition 2: Employers can access the skills to grow highly productive and inclusive workplaces

1. Adaptability, innovation and effective change management is enabled through high quality leadership and management training.
 - Calderdale College delivers a range of ESF funded training, skills and support programmes for businesses including Business Scale-Up Programme and Skills Support for the Workforce offering leadership and management courses. A bespoke business consultancy service includes business resilience and sector specific support.
 - A resource has been developed for the Y&NY Growth Hub website that delivers a holistic skills offer for businesses covering recruitment, retention and upskilling of the workforce, as well as health and wellbeing and inclusive workplaces and practices.
2. Modular training is available (e.g. Skills Bootcamps) that support local employer need for skills that enable the step-change towards net-zero.
 - The Y&NY LEP has successfully bid for £2.9m to deliver modular training courses under the Governments Wave 3 Skills Bootcamps initiative in construction, digital, engineering, logistics and green skills.
3. Higher level technical skills enable businesses to innovate and deliver higher value, sustainable products and services supporting our carbon negative ambition.
 - The Yorkshire & Humber Institute of Technology delivers high quality, higher-level technical qualifications based on a collaborative partnership between colleges, universities and employers in the region

Ambition 3: Local skills providers enable businesses to respond with innovation and resilience to a dynamic economy

1. Local Skills Improvement Planning takes account of the region’s net-zero ambitions
 - A Deep Dive report has been commissioned and published addressing Low carbon skills supply and demand including recommendations in overcoming barriers.
 - Part of the 2022/2023 SAP funding will be used to support the development of Local Skills Improvement Plans in York and North Yorkshire area to ensure local needs are at the forefront of skills planning
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.
 - Funded and bespoke courses adapt to the changing needs of employers and are developed with industry to support employers across the region
3. Skills providers can invest in high quality learning environments that support a state-of-the-art curriculum
 - Getting Building Fund and Local Growth Fund has supported a number of capital skills projects to enable to delivery of education and training in a range of skills including green and digital. £2m invested from Getting Building Fund in 4 skills projects to

support the LEPs net-zero ambitions. £10.3m of Local Growth Fund invested in 14 projects has already achieved 28,773 sqm of new or improved learning floorspace.

Ambition 4: Communities are empowered by learning and skills that enable everyone to participate fully in society

1. National Skills Funding and local initiatives enable the not working to gain the skills to move into higher-paid, sustainable ‘green’ jobs
 - A number of ESF funded programmes provide support to those furthest from the labour market to help them upskill and find employment including Action Towards Inclusion and Skills Support for the Unemployed
 - National Skills provision e.g free level 3 training and Bootcamps are being delivered across Y&NY LEP area.
 - The devolved Adult Education Budget will provide an opportunity to ensure adult education provision is aligned with local needs including those in green skills.
2. An Anchor Institutions Network actively supports good work
 - The Anchor Institutions Network through The Office for Health Improvements and Disparity supports best practice sharing and collaboration between partners
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.
 - UKSPF allocation presents an opportunity to ensure green skills are developed through the People and Skills and Community and Places investment priorities, including through a community wealth building approach.
 - VCSE representation is included on LEP board and LEP representatives are included on VCSE steering groups

5. Programmes & Demonstrator Projects

- **Develop and deliver major programmes:** Major programmes, such as for housing retrofit, business support and energy infrastructure upgrades, are urgently required to deliver net zero. These are highlighted within the sector action plans.
- **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. This can help build confidence and inspire action. Where appropriate, we will ensure that pilot projects are rapidly replicated and scaled-up.

Overarching Interventions	Lead & Partners
<p>Incubating small pilot projects: Community First Yorkshire to have a key role in managing local pilot schemes, providing project management support and linkage to communities. Funding to be secured as required to enable the delivery of pilot schemes. [2023 onwards]</p>	<p>Community First Yorkshire Drax</p>
<p>Promotion of pilot projects and lessons learnt: Utilise existing networks and channels, such as Y&NY LA Climate Action Leads, NEY Net Zero Hub</p>	<p>Y&NY LEP, LAs, NEY Net Zero</p>

and Yorkshire & Humber Climate Commission, to share case studies, lessons learnt and resources to accelerate replication and scale up of projects. [Underway]	Hub, Yorkshire & Humber Climate Coalition
Deliver innovation programmes to support net zero , including PAPI Product and Process Innovation, High Value Biorenewables, and STFC Food Network+. This encompasses programmes that provide opportunities and skills related to net zero, for example Enterprise Works, which focuses on creating new businesses and growing them. [Underway]	University of York

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

6. Infrastructure, Green Industries & Supply Chains

- **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 digital infrastructure, resource processing infrastructure (e.g., for reverse logistics) and assets for growing regional supply chains (e.g., for bio based construction).
- **Grow green industries and supply chains:** We need to support green industries to grow - both businesses that are net zero and those that are enabling the transition to net zero (e.g., housing retrofit). 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. Where appropriate, we will seek to **leverage investment through scale** – working with partners within and outside of the region. This will include joint funding bids and procurement.

Overarching Interventions	Lead & Partners
<p>As part of York and North Yorkshire’s forthcoming <i>Plan for Growth</i>, develop Investment Plans 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. [To be completed by end of March 2023]</p>	<p>Y&NY LEP 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>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.</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. [Underway]</p>	<p>Y&NY LEP, Local Authorities, National Park Authorities Yorkshire & Humber Councils net zero policy workstream, Yorkshire & Humber Climate Commission Policy Forums, Drax, TechBuyer, Business Networks & Trade Bodies.</p>
<p>Increase visibility of good practice and evidence generation by local projects and programmes to inform national policy.</p> <p>Utilise existing and emerging links to national government (via the NE&Y Net Zero Hubs, devolution discussions, North of England Hydrogen Policy Forum etc) to raise awareness and profile of key findings from local research and demonstrator projects to inform national programmes and policy. [Underway]</p>	<p>Y&NY LEP, Local Authorities, North East & Yorkshire Net Zero Hub</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 key opportunities;
- **“What”** – key strategic priorities for each sector that will support the delivery of the scale of ambition;
- **“How”** – high level action plans, with actions prioritised as follows:

Immediate Actions:	Short-term Actions:	Medium-term Actions:
Actions that are either already underway or will commence before the end of March 2023 (FY22-23)	Actions that will commence in between April 2023 – March 2024 (FY23-24)	Actions that will commence after April 2024

- **“Who”** - key partnerships involved in delivery; and
- **“Challenges & Risks”** – key challenges, risks and dependencies 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 the design-up process, we will ensure each sector has a consistent format.

1. Power

York and North Yorkshire's Vision...

A resilient power system that provides affordable energy to all and is net zero before 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 to maximise benefits to local communities
- ❖ Makes the most of existing landscape and infrastructure – where possible, seeking multiple benefits (e.g., flood management, biodiversity) and avoiding land use conflicts
- ❖ 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 (H₂) 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 2 biomass turbines fitted with CCS technology at Drax by 2034, capturing 8 MtCO₂/yr by 2030 (only 20% of which is attributed to region)
- **Deploy CCS retrofits onto Energy from Waste (EfW) generation** by 2030

*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 and the growing cost of living crisis demonstrates the importance of developing a strong renewable power sector to strengthen the region's energy security, and reduce costs for residents and businesses.
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 a 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 whilst preserving the unique landscape heritage of the region.**

What?

Strategic Priorities for Power (2022- 2027)

1. **Increase low carbon energy generation**
Enable, secure investment and deliver rapid increases in capacity in renewables (including, Solar PV, onshore wind, hydropower, and anaerobic digestion).
2. **Improve energy infrastructure**
Facilitate investment and closer working between energy suppliers, flexibility providers (e.g. energy storage), distributors and users to ensure the electricity and gas distribution networks are ready to enable a rapidly-decarbonising future and provide equitable access.
3. **Accelerate Carbon Capture, Utilisation & Storage (CCUS) deployment and ensure hydrogen readiness**
Work with existing large-scale emitters and national government to accelerate CCUS 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 by 2030.

How?

We will do this by...

Interventions	Lead & Partners
Research, Planning & Strategy	
<p>Local Area Energy Plans: regional strategic spatial plan designating future power project development, to be used to: provide evidence for Northern Powergrid to make a case to Ofgem for strategic infrastructure investment; create a portfolio of investment opportunities for developers of renewables and flexibility services (e.g. energy storage). [Draft plan by September 2022, adoption in 2023, annual delivery tracking].</p> <p><i>Note: also mentioned in Heat & Buildings as content overlaps sectors</i></p>	<p>Y&NY LEP, Local Authorities, National Park Authorities, Northern Gas Networks, Northern Powergrid</p>
<p>Develop Ambitious RIIO business cases and Long Term Development Plans that use data generated during LAEPs to inform robust reopeners (2023-) and future business plans (2025-), resulting in efficient and resilient energy systems.</p>	<p>Northern Powergrid and Northern Gas Networks</p>
Collaboration & Innovation	
<p>Cluster collaboration: Encourage co-located organisations to take a collaborative approach to energy infrastructure planning and investment, and support in seeking funding and delivery options. [2023 onwards]</p>	<p>Y&NY LEP, Local Authorities, National Park Authorities Business park landlords, Business Improvement Districts, community groups</p>
Programmes & Demonstrator Projects	
<p>Support the development of low carbon energy projects: Develop and secure funding for a programme that provides flexible wrap-around development support and funding for feasibility studies to accelerate the development of low carbon energy projects. This would support a range of projects, including community energy projects and large-scale generation. [2023-2025]</p>	<p>Y&NY LEP, Local Authorities, National Park Authorities North East & Yorkshire Net Zero Hub</p>
<p>Community Energy North: Provide regional support to community energy projects, with the mechanism finalised by March 2023. [Planning underway]</p>	<p>North East & Yorkshire Net Zero Hub Northern Powergrid, Y&NY LEP, Local Authorities, National Park Authorities</p>
Influencing Government Policy	
<p>Support for Energy from Waste (EfW) Carbon Capture and Storage (CCS): Work with existing EfW facilities and national government to progress CCS beyond industrial clusters, aligned to EfW's proposed inclusion in the UK Emissions Trading Scheme (by mid-late 2020s), including the potential to use Allerton Park as a demonstrator.</p>	<p>North Yorkshire County Council & Amey Y&NY LEP</p>
<p>Future energy system governance: Engage with Ofgem and National Grid ESO to represent and address key regional priorities, including collaborative energy system planning, improved flexibility markets (including battery storage), increased investment and effective grid infrastructure strengthening. [Underway]</p>	<p>Y&NY LEP North East & Yorkshire Net Zero Hub, Local Authorities, National Park Authorities</p>
<p>Business models for BECCS and hydrogen: Work with government to encourage development and deployment of business models for</p>	<p>Drax Y&NY LEP, Third Energy</p>

negative emissions technologies and hydrogen (net zero generation for power and fuels), whilst minimising environmental harm.		
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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 that 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; are part of the ground-breaking **Zero Carbon Humber and East Coast Cluster CCS projects**; and have committed to measures to further improve the sustainability of their biomass supply chain via the Glasgow Declaration on Sustainable Bioenergy. **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. Community-led energy has been limited in North Yorkshire, but new projects such as the community anaerobic digester at Malton (development led by Circular Malton CIC) are reinvigorating the sector and providing a good example for others to follow.

As well as leading by example with their own assets and promoting successful local community- and business-led projects, **Local Authorities** and planning authorities in National Parks will have a role in planning and planning policy for a low carbon energy system. 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.

Challenges & Risks

Although there is ambition and drive to make large-scale changes at a York & North Yorkshire level from a wide range of partners, it is clear that there are significant challenges to overcome which will be insurmountable without seismic changes that are as yet outside the reach and influence of key regional stakeholders. As such, each sector includes key challenges, risks and dependencies and how these will be mitigated to our best ability.

In the context of the power sector, the most important challenges are:

Key Challenges, Risks & Dependencies	Mitigation Approach
<p>Influencing national planning policy – in order to streamline applications for energy generation and storage at every scale, and to provide Local Authorities with the power to encourage and enforce low carbon energy generation and use in new developments.</p>	<p>To be considered as a complementary topic area in the Heat & Buildings interventions on local planning policy reviews and influencing government policy. Engagement with central government around the outputs of the LAEPs also allows for productive conversations on this topic.</p>
<p>Ensuring that the physical and digital infrastructure for net zero energy systems is in place – this is a national issue that is being worked on by Ofgem, National Grid and DNOs across the country, but a swift resolution is necessary to unlock latent investment in renewables and flexibility, where grid infrastructure upgrade costs are the main barrier to securing development finance.</p>	<p>Engaging wherever possible with the key influencers (Ofgem, National Grid, DNOs, BEIS) to continually stress urgency and impacts of underperforming local infrastructure – e.g. via the Northern Powergrid Stakeholder Panel, the BEIS Community Energy Contact Group, and via consultations and calls for input on changing structures and legislation (see Interventions: Influencing Government Policy)</p>
<p>Securing funding, particularly for elements of the system where returns will be socialised rather than resulting in investor returns. Examples include:</p> <ul style="list-style-type: none"> ○ grid infrastructure upgrades that are resilient for modelled/planned future demand; ○ cheap finance (grants, loans and co-investment mechanisms) for small businesses (including SMEs and farms) to invest in small-scale renewables and storage – creating the conditions for SMEs to participate in, and create a ground-swell of support for, a decarbonising energy system, in turn building resilient supply chains and keeping economic benefits within communities. 	<p>Supportive stakeholder groups with clear purpose can develop business cases for funding, pre-emptive of calls for projects, to create robust cases for investment (see Interventions: ‘Develop Ambitious RIIO business cases’, ‘Cluster collaboration’, ‘Community Energy North’ and complementary actions in Heat & Buildings, Business & Industry, and Environment, Land Use, Agriculture & Marine sectors).</p>

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
- ❖ Maintaining existing character of buildings and heritage landscapes
- ❖ 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 H₂ 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 1.8MtCO₂e/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, especially in light of the current cost of living crisis. In addition, reducing the number of fossil fuel boilers will also significantly reduce the various pollutants emitted, including nitrogen 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 to reduce energy demand**
Secure investment, build supply chains and provide support to enable a 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 fabric 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 to prepare for first domestic H₂ boiler installs in the late 2020s, including rollout of necessary infrastructure.

How?

We will do this by...

Intervention	Lead & Partners
Research, Strategy & Planning	
<p>Local Area Energy Plans: Regional strategic spatial plan including retrofit priority areas and heat source zoning, to be used to: inform Local Plan reviews; create strategic approach to and market opportunities for heat networks; identify rooftop solar priority areas; plan gas grid hydrogen rollout. [Draft plan by September 2022, adoption in 2023, annual delivery tracking]</p> <p><i>Note: also mentioned in Power chapter as content overlaps sectors</i></p>	<p>Y&NY LEP LAs, Northern Gas Networks, Northern Powergrid</p>
<p>Archetypal retrofit plans: further research on most appropriate retrofit approaches for hard-to-decarbonise homes, building on the Hitting Hard project (UK Community Renewal Fund, complete December 2022). [2023 onwards]</p>	<p>Local Authorities National Park Authorities, Y&NY LEP, RSLs, Historic England</p>
<p>Retrofit Strategy: Building on the LAEPs and existing work on retrofit planning by City of York Council, North Yorkshire's LGR Housing Workstream and Scarborough Borough Council, create a Y&NY-wide Retrofit Strategy. This will outline a phased approach for delivering retrofit at pace and scale. The approach will be aligned with national strategies and funding landscape, with a particular focus on incorporating innovative financing mechanisms and leveraging market enablers throughout the supply chain (including smart meter rollout). The plan will be based on a fabric-first approach to retrofit and will build upon the archetypal retrofit plans to ensure that measures are suitable for proposed types of property, alongside maintaining local character (e.g., heritage, conservation areas). [Draft outline plan by March 2023].</p>	<p>Y&NY LEP, Local Authorities, National Park Authorities</p>
<p>Financing retrofit: Conduct a review of retrofit financing options and their applicability to Y&NY, and create partnerships with innovators in retrofit financing to enable creation of alternative financing model pilots in Y&NY (building on national research and the Scaling up Better Homes Yorkshire report) [2022-2024]</p>	<p>Local Authorities, National Park Authorities, Y&NY LEP, North East & Yorkshire Net Zero Hub</p>
<p>Local planning policy review: Assess opportunities to:</p> <ul style="list-style-type: none"> • maximise potential to specify high standards for new builds (without impacting viability arguments); • allow low carbon alternatives to become permitted development; and • explore changing conservation area planning restrictions to enable retrofits on heritage buildings. <p>Learn from other localities that have successfully implemented robust new-build guidance above national regulatory levels, and consider influencing national policy (e.g. permitted development rights) [2023-2024]</p>	<p>Local Authorities, National Park Authorities</p>
<p>Public Sector Decarbonisation Skills Fund: Via the North East & Yorkshire Net Zero Hub, Local Authorities have applied to the programme for fully-funded heat decarbonisations plans to be undertaken. Other public sector organisations (national parks, NHS) have partnered with LAs in their bids to</p>	<p>North East & Yorkshire Net Zero Hub, Y&NY LEP, Local Authorities, National</p>

develop plans for other public sector assets. Plans will be completed by the end of March 2023 [Underway]	Park Authorities & the NHS.	
Reuse & adaptation of historic buildings: Work with partners to understand how we can encourage the reuse and adaptation of heritage assets. Gather knowledge and promote good practice examples of historic buildings' adaptation for business, cultural and community uses to provide inspiration and practical guidance for property owners, buyers and tenants [2023 onwards]	Y&NY LEP Historic England, National Park Authorities, other partners to be confirmed.	
Utilise learnings from "Digital Twins" project for hospitals: Under the UK Community Renewal Fund programme (complete by December 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. [2023 onwards]	York & Scarborough Teaching Hospitals NHS Foundation Trust	
Communication, Engagement & Movement Building		
One-stop-shop for energy efficiency: Develop plans and secure funding to establish a 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-first and heat source switching) and making the most of national materials. The approach will build upon UK case studies, lessons from previous local provision (Yorkshire Energy Partnership) and existing local community services already in this space, ensuring that there is a financially self-sustaining model in place [2022 onwards]	Y&NY LEP, Local Authorities Community organisations	
Programmes & Demonstrator Projects		
Low-Carbon Housing Retrofit: Ensure a coordinated approach to develop projects and secure funding for housing retrofit to provide funding for fabric upgrades and low carbon heat sources (E.g., BEIS's Sustainable Warmth programmes, ECO, Boiler Upgrade Scheme) [2023-2028].	Local Authorities, Y&NY LEP	
Solar Together: explore opportunities to develop a combined solar PV and energy storage offer for residents and businesses, with a view to expanding deployment of solar PV on existing buildings, working across the Net Zero Hubs to evaluate best practice and assess collaborative opportunities. Include high-level opportunity mapping and publicity of savings to large estates (e.g. schools & colleges) [2022-23].	Y&NY LEP Net Zero Hubs, Local Authorities, Community organisations, Solar For Schools	
Community Buildings Decarbonisation: utilise outputs of the Community Buildings Decarbonisation feasibility studies programme (UK Community Renewal Fund, complete December 2022) and the Craven Carbon neutral churches trial, to publicise opportunities for decarbonising community buildings and build a pipeline of capital projects seeking funding [2023 onwards]	Community organisations Local Authorities, National Park Authorities, Y&NY LEP	
Developing Skills; Developing Infrastructure, Supply Chains & Green Industries		
Develop skills and supply chains for housing retrofit: Convene partners to co-develop an action plan to rapidly grow housing retrofit supply chains in York and North Yorkshire (Plan to be established by Nov 2022). The plan will ensure 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. The plan will build on expertise and existing research across the NE&Y Net Zero Hub. [Underway]	Y&NY LEP, FE&HE N&EY Net Zero Hub	

<p>Grow the circular biobased construction industry: Work with partners to implement the findings of the “Circular Biobased Construction in the North East and Yorkshire” report which quantified potential benefits of incorporating locally-sourced biobased materials into new buildings. The report identified an action plan to exploiting the £5-15bn worth of opportunities across the North East & Yorkshire, including initial actions on creating a Circular Biobased Construction Working Group and the development of demonstrator projects, e.g. at Dalby Forest. [Underway]</p>	<p>Y&NY LEP, North East & Yorkshire Net Zero Hub</p>		
<p>Influencing Government Policy</p>			
<p>Heat Network Zoning: 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 Zoning pilot (BEIS-funded, January-September 2022) [Underway]</p>	<p>Y&NY LEP Local Authorities</p>		
<p>Expanding support for retrofit: Engage with BEIS to continue to push for more public support for retrofit, including expansion of capital programmes such as LAD, HUG and ECO, sector support such as Public Sector Decarbonisation Skills Fund, MEES enforcement and programmes to boost supply chains and workforce skills, and new financial models [Underway]</p>	<p>Y&NY LEP, North East & Yorkshire Net Zero Hub</p>		
<p>Better buildings now: 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) [2023 onwards]</p>	<p>Lead to be identified</p>		
<p>A clear path for hydrogen: lead stakeholders work with Government to develop a regulatory framework and business model for gas grid hydrogen deployment. [2023 onwards]</p>	<p>Northern Gas Networks</p>		

Who?

Local authorities have significant influence when it comes to new buildings, and are also taking a leadership role in retrofitting homes, including through increased Minimum Energy Efficiency Standard enforcement for the private rented sector. 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, both through policy and access to finance (capital and revenue to support delivery).

Public sector partners are decarbonising their own estates, and amplifying a call to action to their large sphere of influence (e.g. employees, residents, visitors/customers, students). The Public Sector Decarbonisation Scheme (PSDS) has expanded the work being done directly by local authorities on their own estate (including successful applications from 6 out of our 11 local and national park authorities⁴). Projects such as Zero Carbon Craven and the visitor centres retrofit in the North York Moors National Park are good practice examples that can be shared to improve future local public sector retrofit. Current exploratory work on heat networks in Ryedale (collaboration with Ryedale District Council and Third Energy) and Northallerton (see Interventions) will create a blueprint for other green heat network projects in the region.

Hospitals and GPs in the region are covered by five different Trusts, who all have plans to become net zero by 2050 if not before ([in line with the NHS](#)), with Harrogate & District and York & Scarborough NHS Trusts both securing PSDS grants to support their transition. 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 and economically-deliverable plans. The training providers on our patch are also committing to net zero targets, via a [Green & Sustainable Development AMBITION](#).

Community groups and voluntary organisations such as Community First Yorkshire already provide information to local residents on energy-saving advice for their homes, and many climate-facing community groups are seeking to work with local government to provide a coherent service to their communities (e.g. standardised communication materials, local supply chain strengthening).

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. As such they 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). In order to deliver the Routemap, each of these organisations/groups must be

⁴ Successful applications were from North Yorkshire County Council, Harrogate Borough Council, Hambleton District Council, Scarborough Borough Council and both the North York Moors and Yorkshire Dales National Park Authorities

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.

Challenges & Risks

In the context of the heat and buildings sector, the table below highlights the most important challenges/risks/dependencies and our approach to mitigate these to our best ability:

Key Challenges, Risks & Dependencies	Mitigation Approach
Clarity on the roles and responsibilities of different stakeholders for retrofit – the lack of a clear lead department at national government level for driving forward retrofit and heat switching is resulting in a lack of continuity of strategy and funding, which has manifold knock-on impacts throughout the economy.	Continue to utilise existing and emerging links through to central government to push for more coordinated and long-term approaches to delivery of retrofit, via the NE&Y Net Zero Hubs, the Yorkshire and Humber Climate Commission, and discussions on devolution.
Continuity and clear messaging on retrofit as a national priority – despite some positive commitments within the Heat and Buildings Strategy, the gap between ambition and action is creating an uncertain environment for all participants in the retrofit and heat switching markets, and affects market confidence (see ‘Clarity on roles...’ above).	As above, plus using local powers to their fullest extent to build a sense of confidence in retrofit and heat source switching at a regional level (see Interventions table: LAEPs, one-stop-shop, retrofit strategy etc.).
Capacity at Local Authority level to scale up retrofit efforts (see ‘Clarity on roles...’ above) – without a clear, nationally-set role for Local Authorities in all aspects of retrofit and heat switching, their ambition to lead locally is stymied by a lack of internal capacity, meaning actions taken are often reactive rather than strategic (i.e. in response to competitive, short term funding calls), resulting in short-term and fragmented Local Authority expertise and support functions (i.e. linked to individual capital projects).	As above, plus work with small teams involved in retrofit at Local Authorities to advocate for further resource internally, and continually explore opportunities to strengthen teams with project funding, organisational change (Local Government Reorganisation) and devolution (see Interventions: one-stop-shop, retrofit strategy, influencing government policy)
Relatively limited rollout of smart metering and data gaps in housing condition – building strategies and business cases for retrofit projects using incomplete and outdated information on the housing stock and their energy consumption results in large-scale capital retrofit programmes (e.g. LAD) becoming undeliverable within the boundaries of the funding, and it is difficult to build a stand-alone business case for such resource-intensive data-gathering exercises.	See ‘Capacity at Local Authority level’ above, plus using outputs of LAEPs to target data gathering exercises to areas of highest and most immediate need, building business cases pre-emptive of funding availability.
Stronger interventions on market and supply chains for retrofit and off-site construction – in lieu of material progress on the bullets above, it is difficult to provide meaningful local supply chain action without significant seed funding to stimulate the sector.	Concerted effort at a local level may be able to begin overcoming these barrier – see Interventions on ‘Developing Skills; Developing Infrastructure, supply chains and green industries’.

Clarity on whole-life carbon costs of dwellings, especially on replacing heating technology outside of natural cycles, and how this information should inform the roll-out of replacement 'low carbon' technologies.

Conduct initial literature search in collaboration with the Net Zero Hubs and assess need and local appetite for additional research on this topic.

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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 readily accessible sustainable transport options and that 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, safest) and promoting physically and mentally healthy lifestyles.

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

- **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 of 40% in walking kms travelled by 2030
 - Increase of 900% in cycling kms travelled 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. We need to develop an **integrated multi-modal transport system whereby people can seamlessly move between green travel options**. Creating a net zero, multi-modal 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. As outlined in the strategic priorities for transport, we are taking a travel hierarchy approach to prioritise the greenest forms of travel. We need to ensure that active travel, public transport and shared mobility schemes are easy, quick and affordable. 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 around the region - reducing journey times and costs.
3. Developing a sustainable transport system is particularly important to **enable the tourism industry in York and North Yorkshire to decarbonise**. There is an opportunity to improve active travel infrastructure and promote the region as a hiking, cycling and running destination. Improving the infrastructure required for electric vehicles will also enable the region to attract a growing number of eco-conscious tourists.
4. We must ensure that the movement to a net zero transport system is a **just transition** – making sure 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 shared ownership/mobility schemes, electric vehicles (EVs), electric bikes and other micro mobility devices.
4. **Enable cleaner logistics**
Develop the infrastructure to support the public sector and businesses utilise low carbon freight options, such as electrification of fleets, use of bio-fuels and emerging hydrogen technology, alongside freight modal shift to rail and local delivery logistics.

How?

We will do this by...

Intervention	Lead & Partners
Research, Strategy & Planning	
Development of new Local Transport Plans that: <ul style="list-style-type: none"> - Significantly expand active travel infrastructure provision - Encourage development and implementation of LWCIPs, including expanding reach beyond town and city centres - Support the reallocation of road space to cycling, walking and public transport - Support expansion of shared mobility schemes (e.g., car clubs) - Support electric vehicle uptake [2023 onwards] 	Local Authorities (TfN can support through providing evidence of the benefits of reduced car usage and increase active and public travel)
Planning policy review to include development of effective strategy and planning for “15 minute neighbourhoods” from a transport perspective. [2023 onwards]	Local Authorities
Further research understanding travel patterns: Convene partners, secure funding and co-design research to better understand why people travel within our region and improve the availability of travel data. 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	Y&NY LEP, Local Authorities, TfN, Universities

<p>our coastline. This will inform the development of plans to ensure an integrated multi modal transport system. [2023 onwards]</p>	
<p>Coordinated approach to develop a green, integrated multi-modal transport system for residents and visitors across Y&NY. This will link to the development & delivery of Local Transport Plans, including:</p> <ol style="list-style-type: none"> 1. Coordinated approach to active travel ensuring routes are safe and convenient for people, villages and nearby towns are connected, and access to the outdoors (without using a car) is improved. 2. Explore options to deliver expanded and improved bus services across the region. This will include exploration of best technology for rural routes, alongside financial and usage feasibility. 3. Update studies of feasibility and demand for passenger and freight rail services 4. Coordinated approach to increased shared mobility schemes: 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 to enable journey sharing, local car club in Harrogate run by Co-wheels) and identify further opportunities to increase/expand offering, such as exploring potential for a network of “mobility hubs” across Y&NY. This will include understanding the issues and opportunities for heritage, community and cultural activation. 5. Coordinated approach to electric vehicle charging infrastructure roll-out to ensure adequate charge points for a rapid increase in EV uptake and that people are no more than 30 miles from a charger. <p>[2023 onwards]</p>	<p>Local Authorities National Park Authorities, TfN Y&NY LEP, community groups, key service providers and other private sector partners (E.g., West & North Yorkshire Chamber of Commerce’s Transport & Environment Policy group, Enterprise Holdings)</p>
<p>Communication, Engagement & Movement Building</p>	
<p>Transport focused campaign: 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. This will include targeting visitors to the area – promoting the region as a cycling & walking destination and ensuring that they are aware of green transport options before travelling to the region. [2023 onwards]</p>	<p>Local Authorities, National Park Authorities TfN, neighbouring CAs. Further partners to be identified.</p>
<p>Undertake further stakeholder engagement on the potential to decarbonise rail 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. [2024 onwards]</p>	<p>Lead & partners to be confirmed.</p>
<p>Collaboration & Innovation</p>	
<p>Joint-working with neighbouring areas to ensure a joined-up approach to developing a green transport system across boundaries. This will focus on improving connectivity within and beyond the region, and also shaping TfN’s future research projects. [2023 onwards]</p>	<p>Transport for the North (TfN), North East & Yorkshire Net Zero Hub, CAs & LEPs.</p>
<p>Reducing need for travel & supporting sustainable travel: 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 support staff/customers to choose sustainable travel options when travel is necessary. [2023 onwards]</p>	<p>Y&NY LEP Public & private sector anchor institutions</p>

<p>Support research and innovation to enable EV battery recycling: Work with regional and national partners through research initiatives and collaborative projects to improve EV battery recycling (including exploring potential for local EV battery recycling) [2023 onwards]</p>	<p>Innovate UK, Local Authorities, University of York</p>
<p>Skills; Infrastructure, Supply Chains & Green Industries</p>	
<p>As part of Low Carbon Skills Implementation Plan:</p> <ul style="list-style-type: none"> • Assess local skills required to support rail decarbonisation. • Support the development of supply chains for electric vehicle charging infrastructure: Work with partners to ensure that local supply chains are established to support the growing installation and maintenance for EVs and charging infrastructure. [2023 onwards] 	<p>Y&NY LEP, West & North Yorkshire Chamber of Commerce. Lead & wider partners to be confirmed.</p>
<p>Programmes & Demonstrator Projects</p>	
<p>Bus Fleet Decarbonisation: Work with bus operators to decarbonise the bus fleet, and strategic introduction of zero emission requirements in tendered services. There will be a focus on ensuring convenient, affordable and quality bus provision. [2023 onwards]</p>	<p>Local Authorities, Bus Operators</p>
<p>Public sector fleet decarbonisation: utilise outputs from the UK Community Renewal Funded 'A&EV' study (complete by December 2022), to inform business cases for EV charging hubs for large sites with varied EV use (fleet plus staff and visitors), such as hospitals. [2023 onwards]</p>	<p>Yorkshire Ambulance Service NHS Trusts, Local Authorities</p>
<p>Low carbon public transport trials: Build on existing best practice and lessons learnt (e.g., YorBus, EV trials for community transport by Ryedale Community Transport, Hambleton Community Active EC travel to work), develop additional trials, such as on-demand shared transport to support public transport provision. [2023 onwards]</p>	<p>Local Authorities Community First Yorkshire</p>
<p>Personal Electric Transport Hubs: utilise outputs of the UK Community Renewal Funded 'Local E-motion' research and business case development (complete by December 2022), to identify further suitable personal electric mobility hubs across Y&NY, and where feasible seek delivery options for demonstrators. [2023 onwards]</p>	<p>Local Authorities Y&NY LEP</p>
<p>Freight trials: 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.[2024 onwards]</p>	<p>Lead & partners to be identified</p>
<p>HVO trials: Assess viability of using HVO in local authority fleets across York and North Yorkshire for waste collection and small hand machinery, currently being trialled during this financial year in the region. [Underway]</p>	<p>Local Authorities</p>
<p>Investment</p>	
<p>Prioritise transport funding towards enabling low carbon travel choices (including maintenance of cycle routes and pavements in winter) [2022 onwards]</p>	<p>Local Authorities</p>
<p>Influencing Government Policy</p>	
<p>Work with partners to influence Government policy and investment in the following areas:</p> <ul style="list-style-type: none"> • Acceleration and increase of regional investment from national Government in low carbon transport infrastructure, including EV charging points and rail. • Increased national investment to support provision of quality bus provision. • Increased national investment in skills development. [2023 onwards] 	<p>Local Authorities</p>

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.

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Challenges & Risks

In the context of Transport, the table below highlights the most important challenges/risks/dependencies and our approach to mitigate these to our best ability:

Key Challenges, Risks & Dependencies	Mitigation Approach
<p>Level of investment and national policy change required to provide required infrastructure and services to enable a green inter-modal transport system. This is a particularly prominent issue due to the rural nature of the region making it more challenging and costly to decarbonise transport. In relation to public transport, a shift in funding models is required to deliver adequate levels of public transport provision, alongside aligning standards and legislative obligations from service providers.</p>	<p>Key areas to influence national policy have been identified within the Action Plan. We will work with local and regional partners (e.g., Yorkshire & Humber Climate Commission) to influence national policy and investment.</p>
<p>Rapid development of skills and supply chains is required to enable electric vehicle charging provision and rail decarbonisation.</p>	<p>Actions have been identified around supporting skills and supply chain development, but this needs to be underpinned by national funding.</p>
<p>Decarbonising transport and the shift to green transport options is largely reliant on behaviour change. We need to see rapid increases of active travel and use of public transport, alongside a reduction of private car use. These are ultimately personal choices that individuals make.</p>	<p>Actions include a transport-focused communication campaign and a number of actions support making it easy and convenient for people to make green transport options. Further “carrots” and “sticks” may be required to create long term behaviour change.</p>
<p>High upfront costs to consumers to purchase electric vehicles.</p>	<p>As a region, there is little we can do to reduce the costs of EVs. However, the Routemap does support expanding shared mobility schemes (such as car clubs), which can reduce the upfront costs of EVs to individuals. There’s also an opportunity to support the second-hand EV market.</p>
<p>Lack of low carbon technology currently available for larger vehicles is a key challenge.</p>	<p>The region will seek to trial new technology as it comes available.</p>
<p>Current economic viability of public transport is a significant barrier and growing risk - rising fuel and driver costs, combined with driver shortages and the reduced passenger numbers and changed habits following the pandemic. At the same time, affordability and quality of public transport service impacts on uptake.</p>	<p>Actions within the Routemap support increasing the number of passengers using public transport.</p> <p>Local authorities are committed to delivering high quality bus provision. However, additional funding from national government is likely to be required if costs increase.</p>
<p>Existing plans to upgrade major roads may increase the use of private cars.</p>	<p>Plans needs to be put in place to ensure that the design of major upgrade schemes incentivise green transport options, rather than encourage the use of private. For example, ensuring segregated cycle lanes and ease of public transport.</p>
<p>Critical risk that as we transition to EVs, the region is offshoring carbon emissions due to the emissions associated with production.</p>	<p>As part of the region’s ambition to move towards a circular economy, we will encourage the second hand EV market and battery recycling.</p>

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

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

Why?

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. Over **40,000 businesses with a GVA of over £19bn** call York and North Yorkshire home. Key foundation industries include the visitor economy; food and drink production; insurance, finance, business and professional services; packaging technologies and advanced logistics; and structural steel and engineering. Important growth sectors include sustainable energy & bioeconomy; agri-tech; digi-tech, data and creative industries; advanced manufacturing; health & life sciences; and rail innovation.⁵
5. 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 lack of knowledge, alongside 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 will be recognised when support programmes are designed.

⁵KADA (2022) YNY Priority Sector Research Report

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.

In practical terms, this means reducing energy bills through retrofitting to improve the energy efficiency of business premises, as well as simple changes such as switching off lights and switching to low carbon technology, such as LED lighting. Making processes more efficient and minimising waste means businesses can reduce costs and increase profits, as well as reducing their environmental impact.

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.

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.

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.

Improving supply chains to make them shorter and more efficient can change how businesses move their products and materials around the region, saving money through reducing fuel costs, as well as strengthening brand reputation. Potential options will depend on the type of business and location.

4. Move towards circular business models & sustainable supply chains

Support businesses to change the notion of 'business as usual', and help them develop the skills and knowledge they need to adapt to a new way of working. This could include adopting circular business models, and enabling 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...

Delivering actions across key sectors – including foundational industries, such as tourism and food and drink production, alongside supporting emerging growth sectors to decarbonise. Actions also cover supporting the development of green industries that are integral to enabling the region to get to net zero, such as businesses providing low carbon technology.

Intervention	Lead & Partners
Research, Planning & Strategy	
Local Area Energy Plans: 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. [Underway]	Y&NY LEP, Local Authorities, Northern Powergrid, Northern Gas Networks
Develop Decarbonisation Plans for Large Industrial Sites: 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. [2023 onwards]	Y&NY LEP, Businesses, Local Authorities
Survey Small Industry Sites: 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. [2023 onwards]	Y&NY LEP, Businesses, Local Authorities
Carbon capture utilisation: Support and promote research in carbon dioxide utilisation to provide diverse business opportunities and increase circularity of carbon capture. [Underway]	University of York (Green Chemistry)

	Centre of Excellence), Drax
Explore sites for early potential hydrogen use: identify potential sites and undertake initial feasibility work. [2024 onwards]	Lead to be identified
<p>TransFIRE project: as part of the TransFIRE project, over the course of three years, 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.</p> <p>TransFIRE (Transforming Foundation Industries Research and Innovation hub) was developed in response to the Industrial Strategy Challenge Fund (ISCF) 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 CO₂ emissions. [Underway]</p>	<p>TransFIRE Consortium (led by Cranfield University, and locally by University of York)</p> <p>Y&NY LEP, Local Authorities, Businesses</p>
Communication, Engagement & Movement Building	
<p>Engage businesses through Circular Towns & Communities projects and develop a Circular Business Champions Network: As part of the Circular Communities and Towns programme, take a place-based approach to engage and activate businesses in the circular economy. We will also work with partners to develop a network of businesses that are already demonstrating circular economy best practice and will advocate for CE in their communities/towns/business networks. [Underway]</p>	<p>Y&NY LEP</p> <p>Community First Yorkshire, Local Authorities, Circular Malton CIC, CaVCa, Selby District AVS & other community groups.</p>
<p>Establish industry networks/clusters/groups 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. The industry leads will act as net zero champions, advocating for net zero within their communities and networks. This work will utilise our strong business networks already within the region to help SMEs realise the opportunity and get involved.</p> <p>These networks/clusters/groups would include, but not limited to, the following sectors:</p> <ul style="list-style-type: none"> • Tourism • Food & drink • Retail <p>(This action also links to planning, strategy and collaboration) [2023 onwards]</p> <p>Example: Tourism</p> <p>Building on the outputs of an initial workshop with stakeholders in June 2022, co-develop a phased approach to create a sustainable, net zero tourism sector across Y&NY. This will include identifying quick wins and a longer term plan to create mindset shifts and behaviour change. The Plan will cover the different elements of tourism, including travel, food and accommodation, with a focus on creating</p>	<p>Industry leads to be confirmed</p> <p>Yorkshire Circular Lab, FSB, North & West Yorkshire Chamber of Commerce (University of York Management School to support food & drink group)</p>

<p>better experiences and a legacy through sustainable tourism. This work will build upon and be aligned with various other streams of tourism work, including tourism work through Local Government Reorganisation process in North Yorkshire, York’s forthcoming tourism strategy and work at a Yorkshire and Humber level to develop a new destination marketing strategy.</p>	
<p>One-stop-shop for energy efficiency: Develop plans and secure funding to establish a 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-first and heat source switching) and make the most of national materials. The approach will build upon UK case studies, lessons from previous local provision (Yorkshire Energy Partnership) and existing local community services already in this space, ensuring that there is a financially self-sustaining model in place. [2022 onwards]</p>	<p>Y&NY LEP, Local Authorities Community organisations</p>
<p>Collaboration & Innovation</p>	
<p>Work with Innovate UK to maximise opportunities around key areas of innovation required for Net Zero:</p> <ul style="list-style-type: none"> • Power innovation: storage technologies (hydrogen, ammonia, compression, chemical flow), demand side response, hydrogen electricity generation, CO₂ capture & utilisation. • Industrial innovation: industrial technologies to reduce carbon emissions. • Transport data & systems: real time tracking/monitoring to enable better management of traffic flows & multi-modal green transport systems. • Agriculture: low carbon farming models and technology. • CE & circular business models: collaborative circular economy pilot projects (e.g., EV battery recycling); support for businesses to innovate to pilot CE business models. <p>This will include:</p> <ol style="list-style-type: none"> 1. Identifying individual businesses and clusters in Y&NY that are innovating in these areas and putting in place a package of support to help them access national funding streams. 2. Working with Y&NY Growth Hub, support adoption and diffusion of innovative net zero technologies. [2022 onwards] 	<p>Y&NY LEP, Innovate UK</p>
<p>Infrastructure, Supply Chains & Green Industries</p>	
<p>Develop material processing, recycling & reverse logistics infrastructure: 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. [2024 onwards]</p>	<p>Local Authorities, Y&NY LEP, other partners to be confirmed.</p>
<p>Sustainable public procurement: Y&NY local authorities and other public sector organisations to strengthen procurement policy to support net zero ambitions. This will help reduce emissions in the public sector, ensure our supply chains are more resilient to climate-related shocks, and will provide an incentive for companies within the region to offer low-carbon and circular options to meet procurement criteria. This will include incorporating sustainability criteria in tender evaluations, making use of the UK Government Buying Standards and the RU Green Public</p>	<p>Local Authorities & other public sector partners WRAP</p>

<p>Procurement Tool, as well as implementing the recently developed low carbon procurement toolkits for:</p> <ol style="list-style-type: none"> 1) Services – including catering, furniture, ICT hardware, transport and vehicles; 2) Built environment – including new build, maintenance, refurbishment and highways. [2023 onwards] 	
<p>Develop SME supply chains: Linked to the SME Net Zero Programme, provide support for Y&NY SMEs to become more sustainable so that they are able to meet the public sector’s increasing sustainability standards. [2023 onwards]</p>	<p>Y&NY LEP, Local Authorities</p>
<p>Grow green industries: Work with key partners such as the Growth Hub, Sparkfund, PAPI, and Innovate UK to identify and support low-carbon and circular innovation and opportunities within the region. This will also include encouraging start-up green tech companies in our region to assist with the transition, alongside promoting new green market opportunities to existing businesses. [2022 onwards]</p>	<p>Y&NY LEP, West & North Yorkshire Chamber of Commerce, Business Support Programmes</p>
<p>Programmes & Demonstrator Projects</p>	
<p>SME Net Zero Programme: Develop, secure funding and deliver a package of measures to support SMEs on their journeys to become net zero and embed CE principles in how they operate. The programme will address critical barriers that SMEs currently face in engaging with the net zero agenda around: costs; knowledge, skills & capacity gaps; and business model pivoting/adaptation.</p> <p>The programme will provide:</p> <ul style="list-style-type: none"> • Education, tools & exemplar case studies - to make it easy for businesses to understand their existing carbon footprint and how to reduce it (building on Y&NY LEP’s Net Zero Business Toolkit & existing case study bank). • Financial incentives. • Skills development & capacity building. • Consultancy support for business model redesign. <p>The programme will be fully co-designed with business intermediaries & 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>To support the delivery of the programme, an SME-focused communications strategy will be developed. Communications will help SMEs understand the benefits and opportunities of sustainable working, and will have a range of approaches to recognise different business needs. [2023 onwards]</p>	<p>Y&NY LEP (Growth Hub & net zero design group)</p> <p>FSB, West & North Chamber of Commerce, Local Authorities, National Park Authorities</p>
<p>UoY Sustainability Action Plan Project: Student volunteers from UoY’s ESAY programme will help local organisations, businesses or charities to kickstart actions to improve their environmental sustainability. Launching in 2022, 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. [Underway]</p>	<p>University of York</p>
<p>Influencing National Policy</p>	
<p>Working with partners, engage with the central government to inform and direct national policies on specific issues, including:</p>	<p>Y&NY LEP</p>

- Support early **deployment of Carbon Capture Utilisation & Storage (CCUS) infrastructure** in Yorkshire & Humber.
- **National funding to support building retrofit** to overcome high upfront costs for businesses.
- **Incentives for businesses to engage and take action** to reduce their carbon footprint (e.g., tax relief for building retrofit).
- Develop business models and financial incentives for **industrial fuel switching**.
- Research/evidence gathering on **hydrogen and electrification technologies for industry**.
- Additional investment from Ofgem for **infrastructure upgrades** in the region.
- Implementation of **national green procurement guidelines**.
- Stricter **industrial emissions regulations and carbon intensity targets/trajectories**.
- Ensuring national **net zero policy and support programmes are designed for SMEs**.
- **Ensuring high energy efficiency standards for commercial properties, with retrofit support targeting commercial landlords**.
- **Funding for SMEs** to pilot innovative circular business models.
[2022 onwards]

Yorkshire & Humber Councils net zero carbon sub-group;
Yorkshire & Humber Climate Commission

SME specific areas: FSB

DRAFT

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.

We will work to develop net-zero business skills within the region, so that every business is equipped to deal with the transition to a net zero economy. This will help bolster our net-zero skills base within the region, with businesses able to share best practice, and employees able to share knowledge as they progress within their careers.

Challenges & Risks

In the context of Business & Industry, the table below highlights the most important challenges/risks/dependencies and our approach to mitigate these to our best ability:

Key Challenges, Risks & Dependencies	Mitigation Approach
<p>Dependency of national funding and policy change to provide the “carrot” and “stick” to enable businesses to reach net zero. Actions are highly dependent on national policy and a high proportion of interventions require Government funding. Opportunity for Y&NY to use Government funding in a more effective way, leveraging private sector investment and utilising our natural assets to store carbon.</p>	<p>A major barrier for many SMEs in participating in net-zero measures is lack of time and knowledge. We aim to overcome this barrier through our SME net-zero support programme, which will offer skills training and knowledge for businesses, but partner schemes such as TransFIRE and the UoY’s ESAY programme will also help businesses realise the benefits and opportunities (including financial), by moving to sustainable ways of working.</p> <p>By creating this grassroots change, we also hope to provide a strong evidence base for legislative change from Government, as well as a case for funding to help support business transition.</p>
<p>Constrained supply chains. Throughout discussions, the importance of building local, sustainable supply chains was recognised. Current supply chains for building retrofit were identified as a critical challenge, which urgently need improving to deliver the ambitious scale of retrofit set out in the Routemap. Currently demand is not a sufficient driver for business diversification – business will respond to market opportunity and it’s not strong enough at present to instigate that change, but that could also be prompted by national policy/incentives.</p>	<p>We will aim to begin building sustainable supply chains within the region; the TransFIRE project will be key, as it targets foundation industries, and may lead to change in how these industries interact with other parts of their supply chain. This change will also offer case studies to showcase the market opportunities to businesses within the region, and the processes needed to change.</p> <p>Our aim to build sustainable public procurement supply chains is also crucial to creating change; by providing an incentive for suppliers to become more sustainable, we can also hope to create lower-carbon supply chains locally.</p>
<p>Skills base for a net zero economy. Linked to the supply chain challenges, the group discussed the critical need for developing the necessary skills in the economy for the transition to net zero and beyond. It was also discussed that ensuring we have a strong net zero skills base can be used as a lever to attract businesses into the region.</p>	<p>To help develop the skills base we need for transition, we will ensure that these concepts are embedded in training and education, to familiarise our young people with them. This will be coupled with careers support to inspire them seek roles in sectors that champion net-zero. By supporting our green industries within the region, we can also help them grow, creating a flow of roles in these sectors for people completing their education.</p> <p>We will also ensure our current SMEs have the opportunity to develop net-zero skills and knowledge through our SME support programme, which will include skills modules designed for SMEs to improve their carbon literacy.</p>

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:

- ❖ Ensure that food production is central to the approach
- ❖ Support more resilient businesses (e.g., income diversification, “marketable products”)
- ❖ A bottom-up, flexible approach that empowers farmers and other land managers to make their own decisions and ensures no one is left behind
- ❖ Maintain and strengthen biodiversity for positive environmental impacts overall (e.g. avoid monocultures, support changes that benefit nature and landscapes)
- ❖ Enhance coastal and marine management and develop connectivity with land-based initiatives.

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 to support the delivery of net zero, improve biodiversity and level up our national economy.

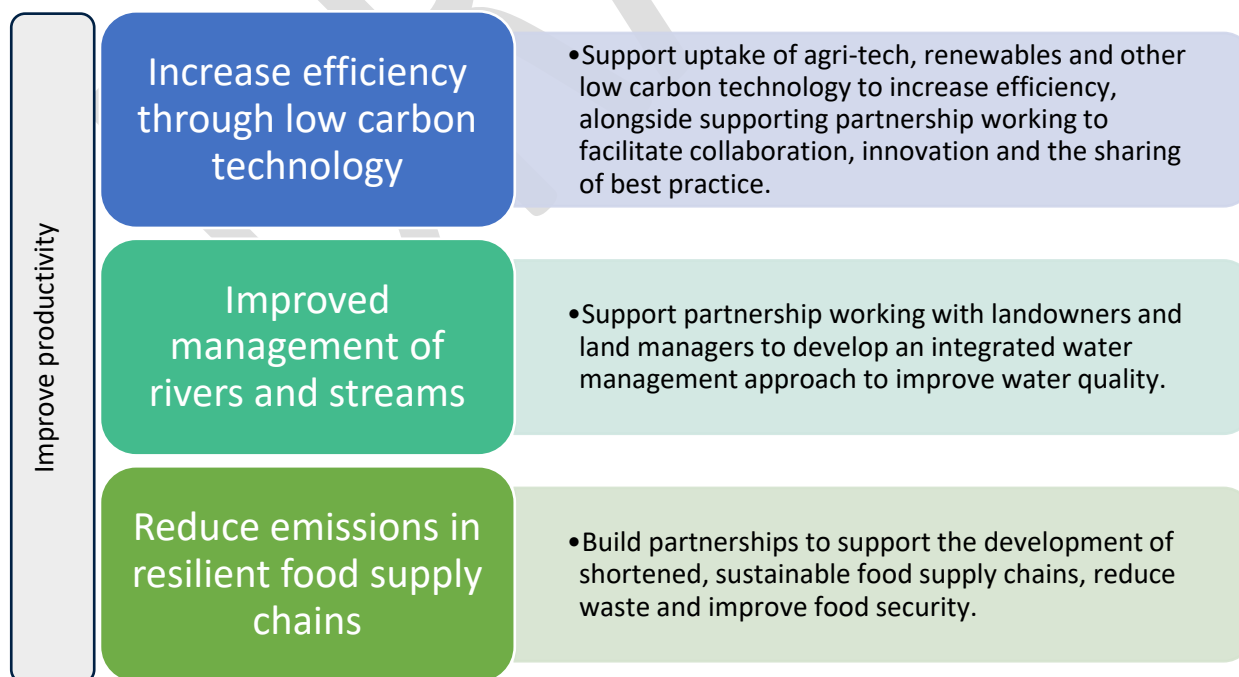
2. **Natural capital directly supports 11% of our GVA**, with the opportunity for natural capital related GVA to grow by 31% by 2050. If we fail to increase investment in our natural capital, we **risk continued degradation of our natural capital** – resulting in a 5% loss in the sector’s GVA, and an 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)

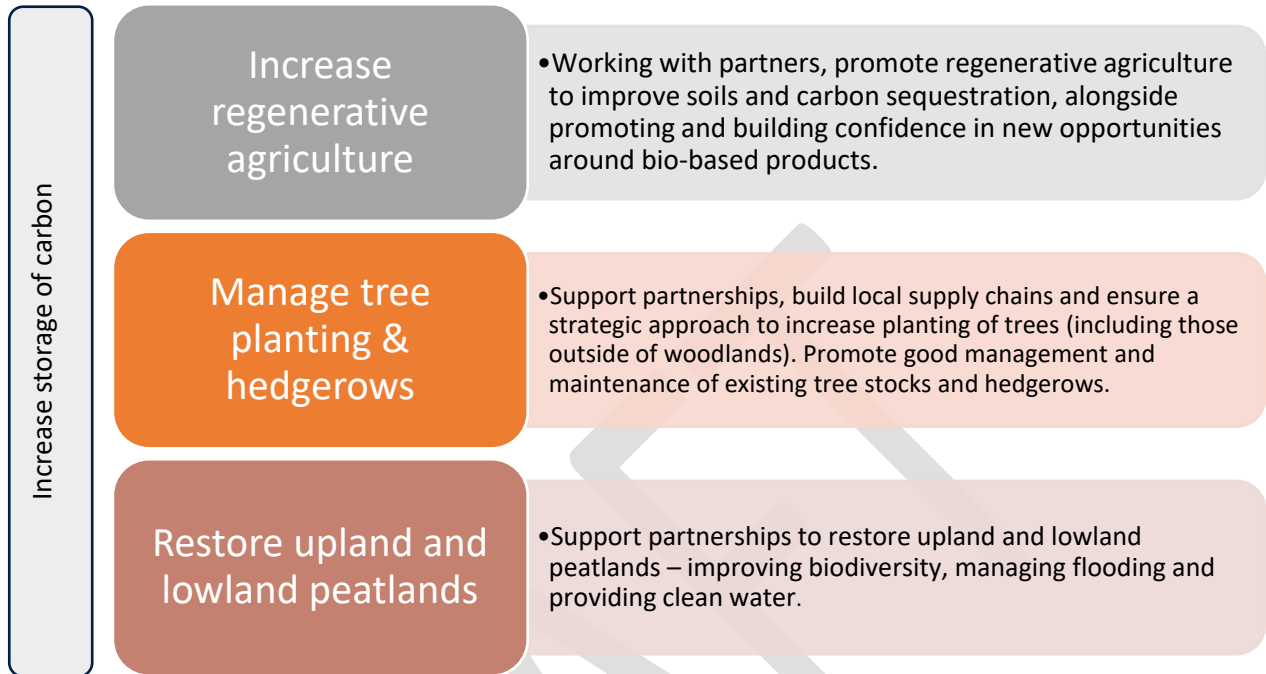
1. Improve productivity to reduce emissions

By improving productivity and efficiency, farmers will produce the same quantity of food (or more) with fewer inputs, in smarter ways embracing low carbon technology, improved management of rivers and streams, and creating resilient, sustainable food supply chains:



2. Increase storage of carbon in our landscapes

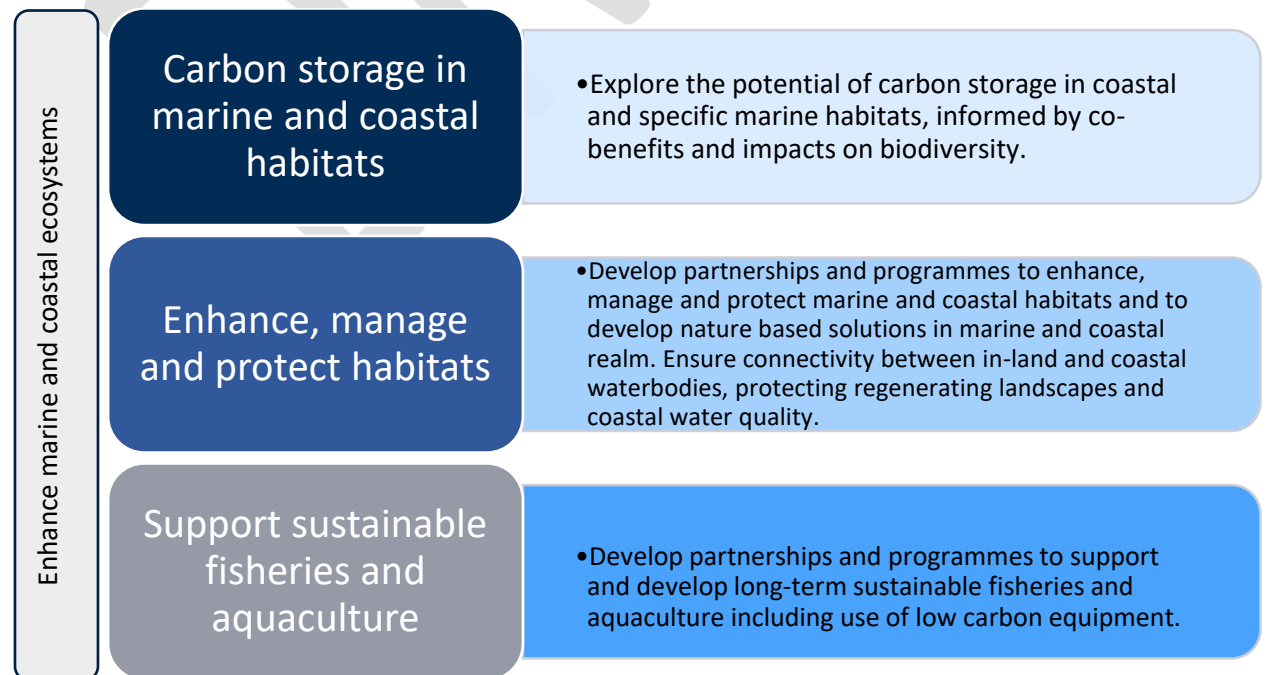
By changing land management practices, use we can capture more carbon – in soils, hedgerows and trees, and peatlands, alongside maintaining and strengthening ecological diversity:



3. Enhance marine and coastal ecosystems to improve carbon sequestration

By protecting and changing coastal* and marine management, we can store more carbon and develop greater connectivity and partnerships with land based initiatives.

*For the purposed of this Routemap coastal is defined IFCA 6-mile boundary



How?

We will do this by...

Intervention	Lead & Partners
Research, Planning & Strategy	
Land Use & Agriculture	
<p>Local Nature Recovery Strategy: Develop a Local Nature Recovery Strategy (LNRS) that will establish priorities and map proposals for specific actions to drive nature’s recovery and provide wider environmental benefits. In York & North Yorkshire, we will explore how the LNRS can include coastal ecosystems. [Planning underway]</p>	<p>North Yorkshire County Council Local Nature Partnership</p>
<p>Natural Capital Investment Plan: 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 specific objectives of the Natural Capital Investment Plan are:</p> <ol style="list-style-type: none"> 1. To attract and optimise investment in YNY’s natural capital, leveraging private sector investment to maximise the impact of public funding 2. To improve biodiversity, soil health and access to the outdoors to support nature recovery, carbon sequestration, economic resilience and human wellbeing. 3. To provide a long-term, strategic approach to land-use change to ensure competing pressures (particularly food security) are fully understood and addressed 4. To drive collaboration within and beyond the region to build capacity, ensure alignment and enable change at pace and scale 5. To empower land owners and land managers to shape the region’s future. <p>[Planning underway]</p>	<p>Y&NY LEP DEFRA, Local Nature Partnership, National Parks, Local Authorities</p>
<p>Food Security – Linked to the NCIP, we will work with partners to understand the competing pressures on land use and determine the implications of environmental land management and biodiversity drivers on food production. Understand land classification and ensure a strategic approach to protect food supply in UK as well as protecting the landscape. [2023 onwards]</p>	<p>To be confirmed.</p>
<p>Net Zero Food Hub - 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. [2023-2025]</p>	<p>University of York Grow Yorkshire</p>
<p>Research into the impact of loss of local Abattoirs - the impact on local supply chains, communities and animal welfare. [2023-2024]</p>	<p>Lead to be confirmed Howardian Hills AONB</p>

<p>Bio-products – Support the market with research and development of bio-based products and solutions to allow significant scale-up of market opportunities and encourage development of new supply chains that give farmers confidence to invest – for example in: Hemp Fibre, Miscanthus, Wool.</p> <p>Seaweed and Kelp are key opportunities with lots of interest from NY farmers for cattle feed. Potential for circular linkages in creating supply chains between marine and livestock farming. [2023 onwards]</p>	<p>North Yorkshire & York Local Nature Partnership Natural England, Biorenewables Development Centre, NYCC, NFU</p>
<p>Promote the Integrated water management strategy. Promote the implementation of contingency planning on farms to tackle the dual risks of flooding and water supply disruption, better understand our water demand and act to reduce waste and, encourage best practice in the management of land and water. [2023 onwards]</p>	<p>NFU (TBC)</p>
<p>Agri-Forestry – further research to establish opportunities to provide farmers with the knowledge and skills to use agri-forestry to effectively utilise underproductive areas of farmland such as corners of fields [2023 onwards]</p>	<p>To be confirmed</p>
<p>Marine & Coastal</p>	
<p>Marine Planning & Licensing: Where feasible, ensure marine planning and licensing supports the delivery of the strategic priorities set out in the Routemap.</p>	<p>MMO</p>
<p>Developing a natural capital approach for our marine & coastal environment: 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. This will include developing plans to improve data for key ecosystems, utilising MMO’s evidence base. [2023-2028]</p>	<p>Yorkshire Marine Nature Partnership</p>
<p>Carbon sequestration research: Kelp and seagrass (inshore) are important assets but more research is needed to assess current state of the east coast forest before plans and projects can be developed. [2023 onwards]</p>	<p>Lead to be agreed. Yorkshire Marine Nature Partnership</p>
<p>Developing Skills</p>	
<p>As part of Low Carbon Skills Implementation Plan, develop plans to improve skills in the following areas:</p> <ul style="list-style-type: none"> • Regenerative farming & soil management • Assisting farmers and producers to supply directly to public sector procurements (Schools, Hospitals etc.) including contract management. • Precision farming techniques (link to Peer to Peer and Special Interest Group). • Undertaking farm carbon audits. 	<p>Y&NY LEP & Partners</p>
<p>Collaboration & Innovation</p>	
<p>Land Use & Agriculture</p>	
<p>Delivery of FixOurFood Programme (~2026):</p> <ul style="list-style-type: none"> • Regenerative Farming (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 	<p>University of York 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"> • Hybrid Business Models (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. • Sustainable & Healthy Food (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. <ul style="list-style-type: none"> ○ Shortened Food Supply Chains – Ensure clarity between ‘buying locally’ and ‘shortened supply chains’ to help enable better sourcing and choices. Sustainable public procurement could be an important tool in this developed by working with anchor institutions. <p>[Underway]</p>	<p>University , Spark York, Grow Yorkshire, Food Foundation (and others)</p>
<p>Precision Agriculture – Working with partners to develop understanding and uptake of precision farming techniques and associated technologies. Potential to establish a regional Farmer Special Interest Group. [2023-2025]</p>	<p>Future Farmers of Yorkshire, Grow Yorkshire, NFU (TBC)</p>
<p>Circular Economy – The Local Nature Partnership promote how local landscapes can support local green energy (e.g. through AD) and has the potential to create new jobs, improve biodiversity, and provide green energy. [2023 onwards]</p>	<p>LNP, plus others to be confirmed</p>
<p>Electric vehicles & machinery - 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. [2023 onwards]</p>	<p>To be confirmed</p>
<p>Facilitating collaboration to support community woodland projects: Bring together key partners involved in community woodland projects to share best practice and bring forward further initiatives. [2023-2025]</p>	<p>Local Authorities, LNP, White Rose Forest, Yorkshire Dales Millennium Trust</p>
<p>Marine & Coastal</p>	
<p>Support Yorkshire Marine Nature Partnership: 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. [Underway]</p>	<p>Yorkshire Marine Nature Partnership, Y&NY LEP</p>
<p>As part of Circular Towns & Communities project, build on the initiative run by Yorkshire Wildlife Trust (YWT) – “fishing for litter” to reduce ocean plastics (2023-TBC)</p>	<p>To be confirmed</p>
<p>Explore feasibility of early-stage projects, including</p> <ul style="list-style-type: none"> • Marine & Coastal - nature based solutions: High potential for nature based solutions e.g., “biofilms” for reducing erosion on infrastructure. 	<p>To be confirmed</p>

<ul style="list-style-type: none"> • Blue carbon credits: Potential to establish ‘blue carbon credits’ and be a demonstrator area – biodiversity net gains for seas which could be a USP for the region. • Source to Sea approach: Opportunity to engage with catchment partnerships/inland waterways take a ‘Source to Sea’ approach to connect land based priorities to marine. [2023] 	
<p>Programmes & Demonstrator Projects</p>	
<p>Land Use & Agriculture</p>	
<p>Farming in Protected Landscapes (FiPL): Create case studies and utilise lessons learnt from the current FiPL programme to shape future policy and programmes. [2023-2025]</p>	<p>Yorkshire Dales National Park Authority, North York Moors National Park Authority, AONBs, Grow Yorkshire</p>
<p>Farm Carbon Audits: Secure funding to build on the successful pilot of 14 upland farms 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. [2023-2025]</p>	<p>Lead to be confirmed. Yorkshire Dales National Park Authority, Nidderdale AONB, Yorkshire Water, Grow Yorkshire</p>
<p>Hemp-30 Project 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 [Underway -2027]</p>	<p>University of York</p>
<p>White Rose Forest: 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 Yorkshire between 2021 and 2025, with the support of landowners and farmers, and funding from the Government’s Nature for Climate fund. Wider partners will support collaboration with tree and woodland planting opportunities e.g. Government’s Nature for Climate Fund. [Underway]</p>	<p>White Rose Forest, North Yorkshire County Council, City of York Council, Harrogate Borough Council, Craven District Council, Forestry Commission, National Trust</p>
<p>Upland peat restoration programme: 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"> • 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 	<p>Yorkshire Peat Partnership Local Nature Partnership, Yorkshire Water, Natural England, NYMNP, YDNPA, Environment Agency Nidderdale AONB, NFU</p>

<p>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.</p> <ul style="list-style-type: none"> • Funding from Innovate UK’s Knowledge Transfer Programme and VP plc will allow YPP to find an answer to a 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. • 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. [Underway] 	
<p>Lowland peat restoration project – 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 to restore lowland peatland, including:</p> <ul style="list-style-type: none"> • Farm carbon audits – to establish initial carbon baselines and recommend key measures to reduce emissions and sequester carbon on farms. • Exploratory engagement & research – working with farmers to understand how lowland peat can be restored, without compromising farm productivity. • 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). <p>[2023-2026]</p>	<p>Yorkshire Wildlife Trust, NFU, CLA, Yorkshire Dales National Park, Nidderdale AONB, Yorkshire Water</p>
<p>Skell Valley Scheme: The National Trust and Nidderdale Area of Outstanding Natural Beauty (AONB) are the lead partners of sixteen organisations who 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"> • 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. • 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. • People are empowered - We’ll empower people to deliver projects for nature, heritage and landscapes by supporting them in learning the skills they need and removing current barriers that stop people accessing the outdoors and nature around them. • Heritage is celebrated - We’ll save our heritage from the threats of climate change and general neglect and create new and exciting 	<p>National Trust & Nidderdale AONB</p>

<p>opportunities for people to explore the nature and history of the Skell Valley and be involved in its care.</p> <p>Key learnings from the project will be utilised to shape future policy and actions within the Routemap. [Underway]</p>	
<p>Vertical, urban farm pilot. 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. [Underway-2027]</p>	<p>Make it York Spark, University of York (FixOurFood)</p>
<p>Marine & Coastal</p>	
<p>Concrete Coast Project: 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>[2023-2025]</p>	<p>Yorkshire Marine Nature Partnership, Environment Agency, East Riding of Yorkshire Council, Scarborough Borough Council, University of Hull</p>
<p>Infrastructure, Supply Chains & Green Industries</p>	
<p>Land Use & Agriculture</p>	
<p>Yorkshire Tree Supply Chain project – mapping the end-to-end stakeholders associated with tree planting and management to understand the potential to grow the supply chain within the region. [Underway]</p>	<p>North Yorkshire County Council University of Huddersfield, Grow Yorkshire, White Rose Forest</p>
<p>Local Food Economy – Promote balanced diets featuring plant-based foods, such as coarse grains, legumes, fruits and vegetables, and animal sourced food produced sustainably in low carbon systems. British farming with its extensive, grass-based, grazing systems produces some of the most sustainable beef in the world (Government’s Committee on Climate Change - greenhouse gas emissions from UK beef are about half the global average).</p> <p>Local authorities can boost agri-food by procuring local and regional produce. Simplifying the procurement process and improving food procurement practices support local producers and farmers. [2023-2025]</p>	<p>NFU, Future Farmers of Yorkshire, DeliciouslyYorkshire and others</p>
<p>Creation of a Yorkshire Hemp Special Interest Group to drive the 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. [Underway]</p>	<p>Biorenewables Development Centre Grow Yorkshire, University of York, Clarion Solicitors</p>
<p>Dynamic Purchasing Platform. To develop a platform to shorten food supply chains and connect SME food producers to public sector procurement. [2023-2025]</p>	<p>Springfield Agri, Crown Commercial Service, University of York, DeliciouslyYorkshire, Grow Yorkshire,</p>

Marine & Coastal	
Developing supply chains: Opportunity to develop supply chains for green industries e.g., aquaculture. Current challenges relate to lack of processing facilities and infrastructure (e.g., need processing facilities for seafood production & aquaculture). [2023-2025]	To be confirmed
Influencing Government Policy	
Land Use & Agriculture	
Environmental Land Management Scheme (ELMs): 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. [Underway]	Y&NY LEP, Local Authorities, National Park Authorities Grow Yorkshire, YFFRN & partners
On-farm renewables: Policy and funding to promote small scale renewables on farms and help fast-track grid connection capacity. Whilst strengthening planning controls to protect productive farmland from being used for large scale developments, ensuring planning process is consistent across the UK. [2023 onwards]	To be confirmed. NFU, CLA
Carbon Offsetting - Policy requires clarification and consistency. Needs recognition of the existing biodiversity in the landscape which is being earmarked for carbon sequestration. [2023 onwards]	To be confirmed
Marine & Coastal	
Influencing Policy: Due to lack of direct influence past 6 miles there is potential to form networks to establish evidence base and influence Government policy. [2023 onwards]	Y&NY LEP (and others)
National Policy: Work to influence national policy where appropriate (e.g., reducing mechanical dredging). [2023 onwards]	To be confirmed

Who?

For land use and agriculture, **Grow Yorkshire** will be a key strategic partner, with a key role in developing and supporting partnership working. 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 farms 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.

For marine and coastal ecosystems, the **Yorkshire Marine Nature Partnership** will be a key convenor to support collaboration and partnership working.

Groups and organisations that have been identified to support and deliver the strategic priorities for land use, agriculture and marine are included in the table on the next page.

1. Improving Productivity to reduce emissions:	
Partner Organisations	Supporting Strategies
NFU – Net Zero farming	Achieving Net Zero - Farming's 2040 goal
NFU – Facts about British Meat	https://www.nfuonline.com/archive?treeid=140205
CLA – Net Zero Transition	The Net Zero Transition
Yorkshire Dales National Park Authority	National Park Management Plan 2019-2024
North York Moors National Park Authority	North York Moors National Park Management Plan 2022 - 2027
Howardian Hills AONB	Howardian Hills Management Plan 2019-2024
Nidderdale AONB	Management Plan 2019-2024
FixOurFood Programme (University of Leeds, City of York Council, University of Oxford, Cranfield, Spark York, Grow Yorkshire, The Food Foundation, DeliciouslyYorkshire (and others))	Programme Overview
NY&Y Local Nature Partnership	Local Nature Partnership Strategy
Yorkshire Agricultural Society (Future Farmers of Yorkshire, Farm Scientist Network, Yorkshire Food, Farming & Rural Network)	
2. Storing of carbon in the landscape:	
Partner Organisations	Supporting Strategies
NFU	Achieving Net Zero - Farming's 2040 goal
CLA	The Net Zero Transition
White Rose Forest	
Yorkshire Dales National Park Authority	National Park Management Plan 2019-2024
North York Moors National Park Authority	North York Moors National Park Management Plan 2022 - 2027
Howardian Hills AONB	Howardian Hills Management Plan 2019-2024
Nidderdale AONB	Management Plan 2019-2024
NY&Y Local Nature Partnership	Local Nature Partnership Strategy
Fera Science	
Yorkshire Peat Partnership (managed - Yorkshire Wildlife Trust)	
The Rivers Trust	
Yorkshire Water	Yorkshire Water Carbon Strategy
Biorenewables Development Centre	
BioYorkshire (University of York, Askham Bryan & FERA Science)	
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))	Programme Overview
3. Enhance marine and coastal ecosystems to improve carbon sequestration	
Partner Organisations	Aligned Strategies
Yorkshire Marine Nature Partnership	NE Inshore & Offshore Marine Plan 2016-2021 Flamborough Head Marine Management Plan
North York Moors National Park Authority	North York Moors National Park Management Plan 2022 - 2027
Circular Coast - growing a sustainable future for communities on the Yorkshire Coast	https://cavca.org.uk/circular-coast/
River basin management plans	Environment Agency https://www.gov.uk/government/collections/draft-river-basin-management-plans-2021

Challenges & Risks

In the context of Land Use, Agriculture & Marine, the table below highlights the most important challenges/risks/dependencies and our approach to mitigate these to our best ability:

Key Challenges, Risks & Dependencies	Mitigation Approach
Supply chains: Shortened, resilient supply chains are key to development of several interventions in order to deliver the ambitious scale of change throughout the Land Use, Agriculture and Marine section of the Routemap. Supply and demand requires careful balancing across the entire supply chain, enough at present to instigate that change, but that could also be prompted by national policy/incentives.	Undertake professional supply chain research and mapping to ensure relationships are understood across the supply chain, weaknesses are highlighted and opportunities for development identified.
Skills for Environmental Land Management: (including Regen Ag, Precision Ag, Agri-tech and Agri-forestry). Across this section of the Routemap there is significant concern regarding current and future skills provision critical for delivering the transition to net zero and beyond.	Formation of Specialist Interest Groups to share best practice and encourage peer-to-peer learning. Ensure basic business skills training and support is available and accessible. Work with skills providers and Ag colleges to ensure appropriate training is available
Public Sector Food Procurement. Local Authorities can boost agri-food sector and boost climate-friendly food supply chains by procuring local and regional produce.	Simplify public sector procurement policy and improve food procurement practices to ensure barriers to SME producers are minimised.
Carbon Trading and Offset. Requires policy development and structured market approach	Promote new markets for carbon offsetting. Ensure appropriate land use – managing marginal and less productive land for carbon storage and renewable projects
Investment in new technologies and best practice. Many land and marine productivity initiatives require investment.	Support capital investment programmes for development of technology solutions and infrastructure. Ensure local strategies are rural proofed to ensure SME businesses have access to investment and skills development Support partnership working to drive inward investment in Agri-tech accelerating growth of clean-tech
Research and Development. Lack of funding and investment hinders sector R&D progress, delaying research entering the market to lower carbon emissions within the Routemap timeframe.	Support development of science parks, research centres and knowledge sharing in the rural economy to fast-track land and marine research and development. Engage with Agri R&D centres, facilitate agri-tech investment and promote Special Interest Groups and partnership organisations.

	Promote knowledge of new technologies to boost business confidence
Managing Tress and Hedgerows. Requires specialist knowledge and advice to ensure appropriate planting for the land and understanding of biodiversity impacts. Supply chain resilience, skills and long term management are key risks to the scale of ambition.	Understand regional supply chain potential and opportunities for making resilient. Work with landowners and farmers to ensure best solutions are obtained and tree planting opportunities outside woodland recognised. Promote new markets for locally produced timber and wood fuel.
Bio Based Products. Requires supply chain development to provide confidence to growers and vertical markets and significant scale-up of opportunities	Support promotion of markets for bio-based products. Establishing resilient markets for product would provide confidence for investment by farmers.
Clean Energy. Landowners and farmers well placed to host renewable energy but competition for land with other low carbon initiatives is a key risk (for example tree planting, rewilding) whilst ensuring food production is maintained. Therefore a clear land use strategy is required.	Policy required to promote renewable energy infrastructure, grid connection capacity and infrastructure ensuring appropriate location of land based solar PV farms safeguarding productive farm land for food production. Support for AD projects. Knowledge exchange mechanism needed for new opportunities.

DRAFT

Governance, Performance Monitoring & Reporting

DRAFT

Governance, Performance Monitoring & Reporting

Governance Model

Over the next 12 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 underway with discussions with Government around a devolution deal for the area.

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

Working with partners, 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 towards 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 and the associated "scale of ambition" for each sector within the Routemap. This is likely to involve repeating the emissions modelling that was carried out in the Carbon Abatement Pathways study.

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:

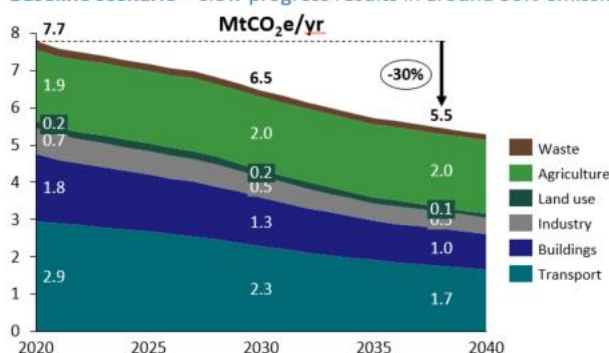
- a) Stay within a cumulative carbon dioxide emissions budget of between 91 and 107 million tonnes (MtCO₂), depending upon the allocation of the budget, for the period of 2020 to 2100. At 2016 CO₂ emission levels, the region would use this entire budget within 5 to 6 years.
- b) Initiate an immediate programme of CO₂ 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.
- c) Reach zero carbon no later than 2041.

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

The research focused on:

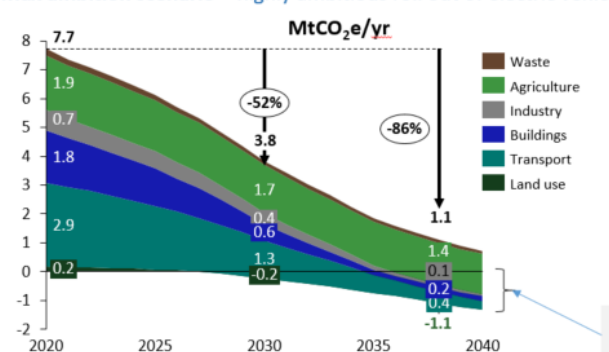
- Developing technically robust emissions reductions pathways, to enable the region to meet proposed net zero emission reduction targets.
- Identifying key milestones, decision points, policies and interventions that can drive the transition toward these outcomes, including timeframes of actions and 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 MtCO₂e/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.

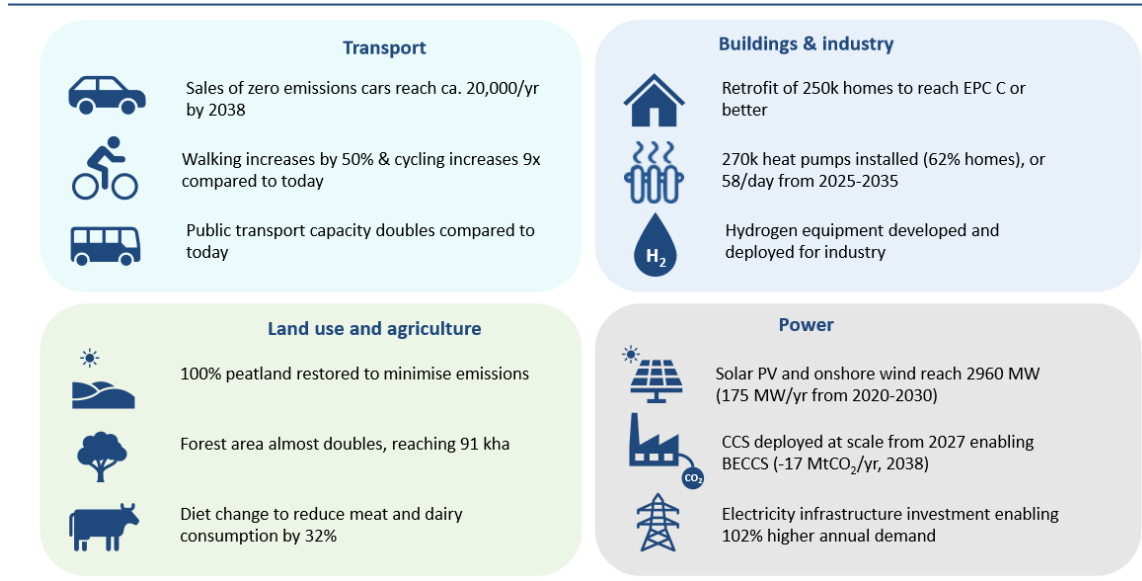
Max ambition scenario – highly ambitious roll out of electric vehicles, active travel, heat pumps & tree planting makes rapid progress



- 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 MtCO₂e/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.

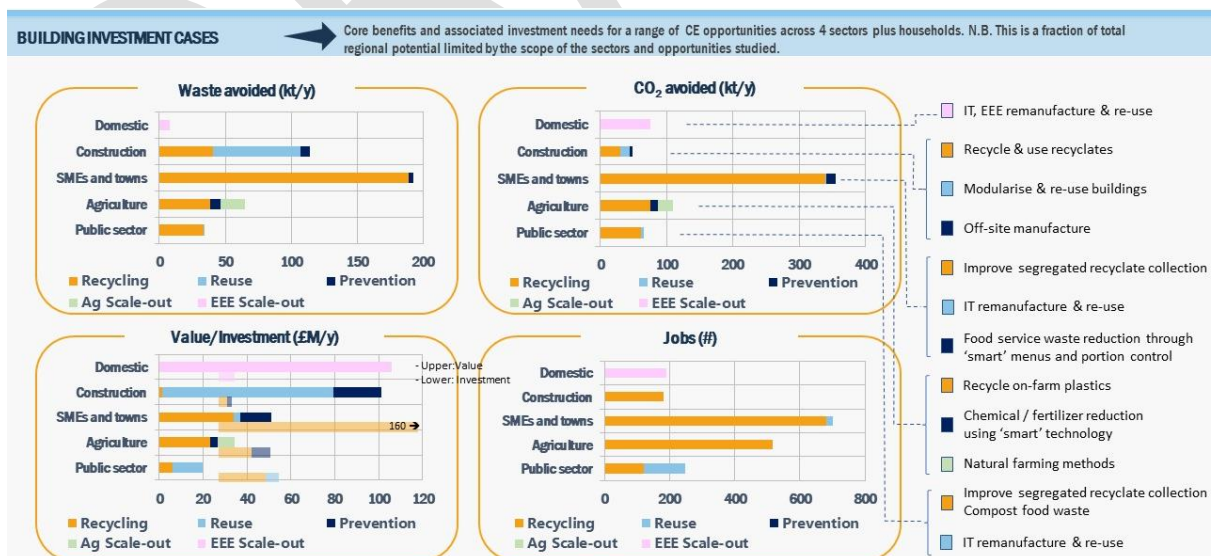
Land use emissions are negative, offsetting some residual emissions in other sectors

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 CO₂e 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.



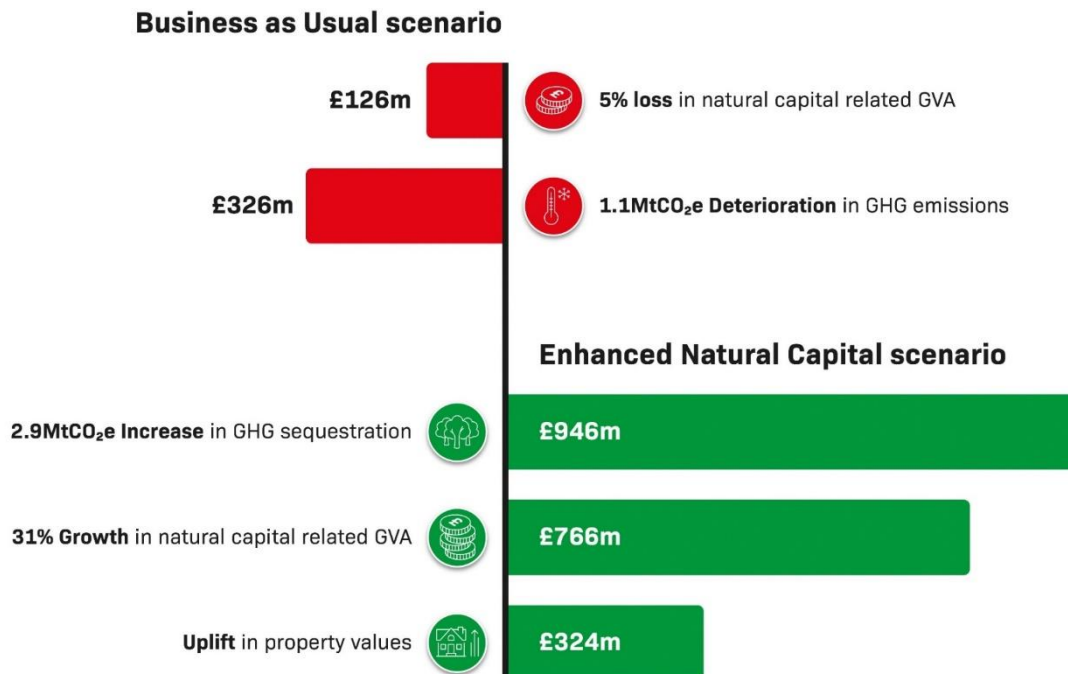
4. Natural Capital Study (Eftec)

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 2.9MtCO₂e.

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 CO₂.
- 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
Y&NY Registered Providers Group	<i>Specifically social housing</i>		<i>Specifically social housing</i>	
Y&NY Housing Board			<i>Regional strategic oversight</i>	
York Housing Energy Efficiency Board	<i>Specifically City of York</i>			
Local Authority (LA) Planning departments	<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>
Local Plan teams			<i>Local strategic planning</i>	<i>Local strategic planning</i>
LA Home Improvement teams	<i>Track record, focussed on fuel poor</i>			
LA economic development teams		<i>Some influence, no explicit role</i>		<i>Some influence, no explicit role</i>