

NP11



Net Zero North: Collaboration Powering Global Britain

Economic Analysis and Delivery Plan

October 2022



Contents

Page

1. Economic Analysis	3
1.1 – Supply Side	6
1.2 – Demand Side	23
1.3 – Skills	41
2. Detailed delivery plans	47
2.1 – Supply Side	49
2.2 – Demand Side	57
2.3 – Skills	65

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Economic analysis



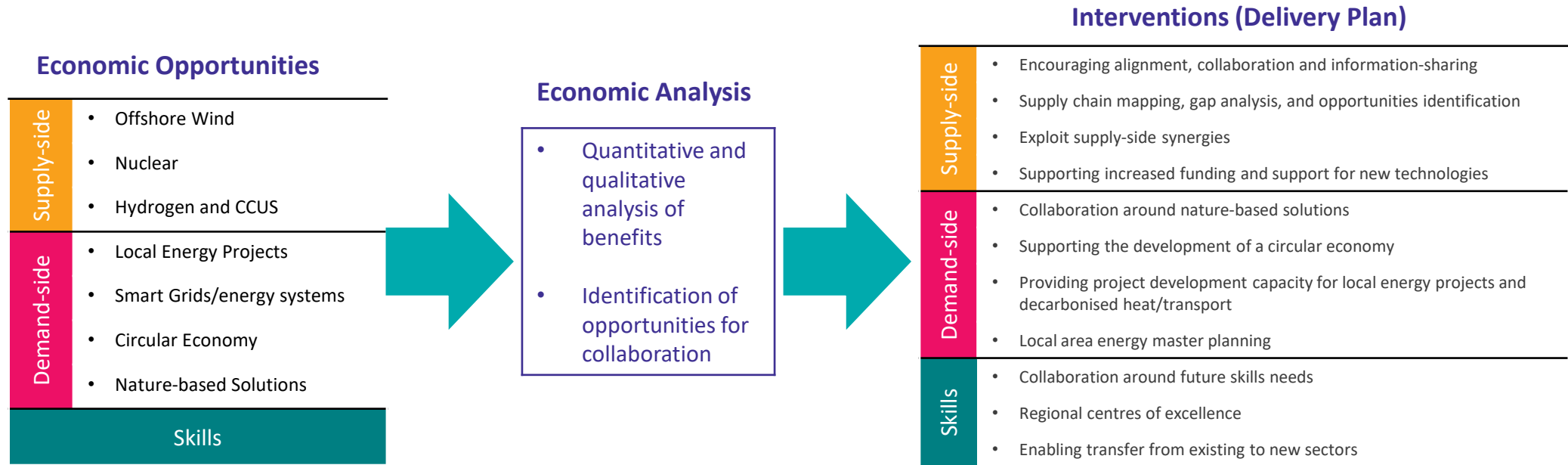
1. Introduction to Economic Analysis

Process

- This report builds on the Net Zero North prospectus, using the priority areas as a starting point for identifying collaboration opportunities and how to make these happen. For each priority area we identify what collaboration looks like; set out the benefits from collaboration; and develop a high-level delivery plan for the practical steps that can be taken to realise these benefits.
- Our findings are a result of engagement with the Northern Powerhouse group of 11 Local Enterprise Partnerships in the North of England ('NP11 LEPs'). In creating this report, we engaged LEP representatives and local partners through a combination of in-person workshops and bilateral engagement to score and rank collaboration opportunities based on their strategic fit and deliverability in the North.

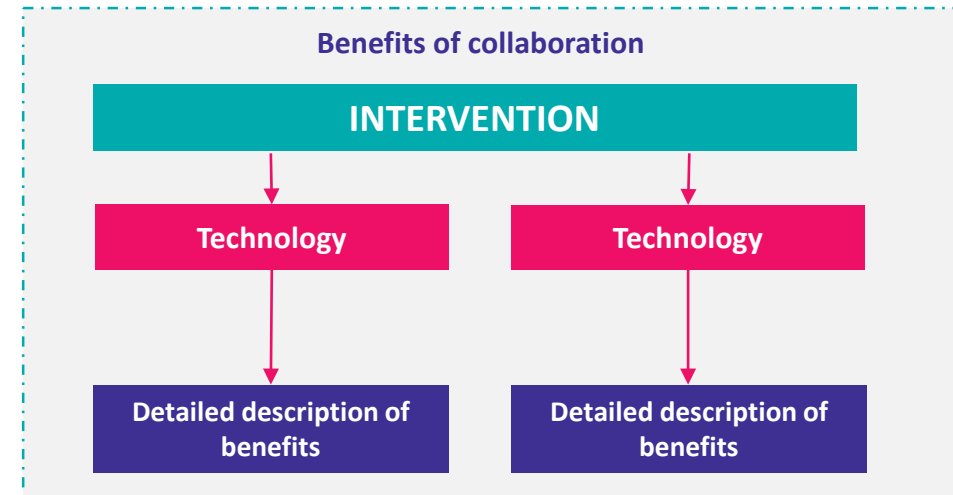
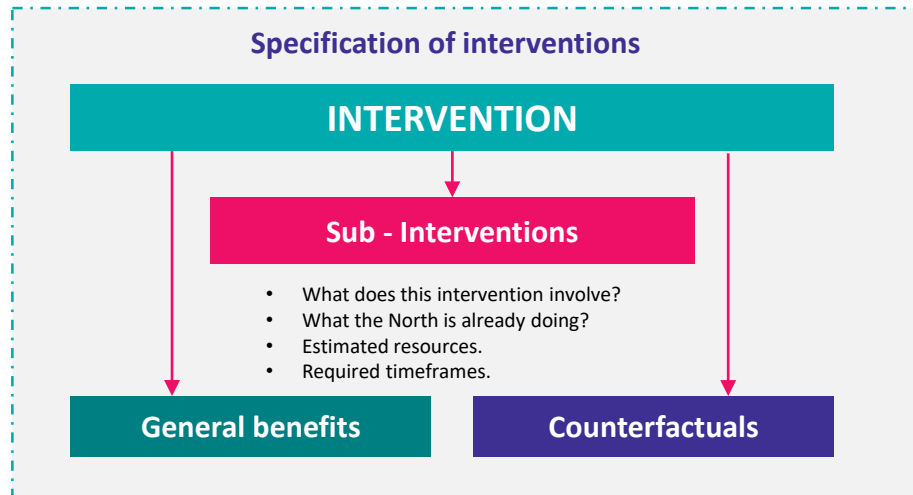
Output

- Through our engagement with NP11 LEPs, we identified several key areas, broadly categorised under 'supply-side', 'demand-side' and 'skills', where collaboration between the private sector, local partners, and government across the North has the greatest potential to create additional economic benefits. Where possible, some of the economic benefits arising from collaboration were quantified to illustrate the economic benefits that can be achieved through collaboration.

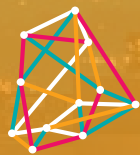


1. Structure of economic analysis

- Logic maps show how the ‘interventions’ to increase collaboration around supply side and demand side opportunities flow through into economic, social and environmental benefits for the region.
- In this section, we develop the economic and strategic case for greater collaboration by setting out:
 - **Specification of interventions:** what is involved, and the resources required. This analysis is done at a total resource level, and does not seek to apportion resources to particular stakeholders involved in delivery.
 - **The ‘size of the prize’:** the benefits that greater collaboration will unlock. The holistic benefits of each intervention are set out in the logic maps, while the detailed description of benefits (and quantitative estimation where possible) is done by technology, reflecting the structure of the existing evidence base the analysis draws on.
 - **Counterfactual:** what is the likely outcome in the absence of enhanced collaboration?



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1.1 | Supply side

- Specification of interventions
- Benefits of collaboration

1.2 | Demand side

1.3 | Skills/Supply chain

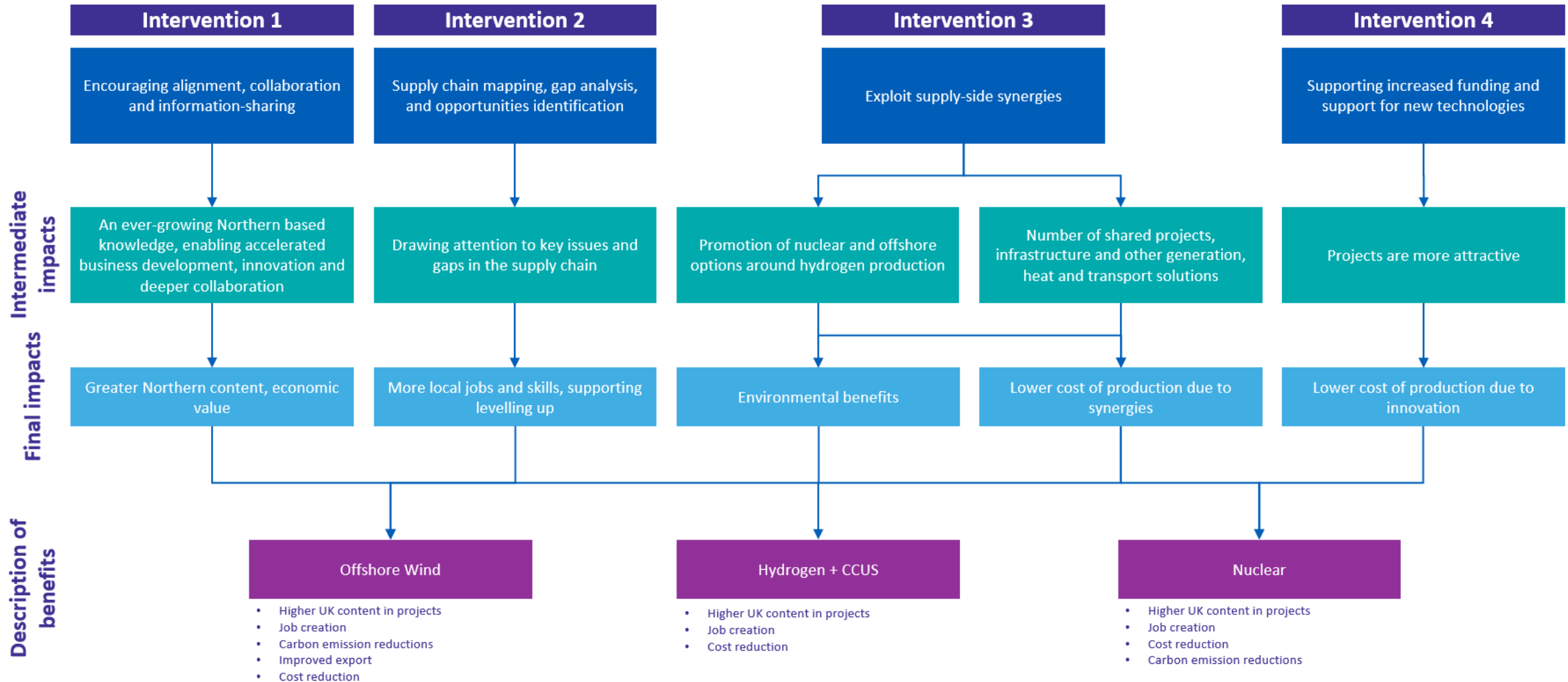
Economic Analysis



1.1 Supply side: Specification of interventions

- Building on the logic map set out on the next page, this section describes the identified interventions in more detail.
- This includes some collaborative activities that are already being undertaken in the North, and new proposed programmes of work to establish collaborative action.
- An initial high-level estimate of resources required to deliver the collaboration is also made. This estimate is for total resources rather than by organisation. Timeframes over which the interventions are required are also indicated.
- For each intervention, a qualitative summary of the benefits of the intervention and what is likely to happen in its absence (the counterfactual) is provided.
- The logic map on the following page outlines the demand-side interventions, in the following format:
 - **Intervention:** the opportunity for collaboration, identified through proformas and workshops.
 - **Intermediate impact:** the high-level, holistic benefits that the intervention is expected to generate.
 - **Final impact:** specific benefits which can be included within the Green Book appraisal framework to assess policy benefits. Where the evidence base around benefits is less developed, these impacts can be described qualitatively rather than quantitatively.
 - **Description of benefits:** structured for each of the key technologies, reflecting the existing evidence base around benefits.

1.1 Supply side: Specification of interventions



1.1 Supply side: Specifications of interventions

Intervention 1: Encouraging alignment, collaboration and information-sharing

	Development of shared business cases	Organising regional forums to share information	Increasing cluster alignment
What does this intervention involve?	<ul style="list-style-type: none"> Shared resource to identify priority areas /projects where shared businesses cases can be the most advantageous Identifying key stakeholders, and initiating contact with them to feed into business cases 	<ul style="list-style-type: none"> Stronger links between Northern Hydrogen Forum, Hydrogen Council, and Industrial Cluster Forum Manage operation of this new group on a quarterly basis Share learnings from initial projects to enable wider decarbonisation (esp. beyond clusters) 	<ul style="list-style-type: none"> Acting as 'one voice' to seek clarity around business models, funding and timing issues. Increased visibility around cluster plans and project pipelines
What the North is already doing	<ul style="list-style-type: none"> North of England Hydrogen Forum Existing work on cluster optimisation, facilitated by Net Zero hubs 	<ul style="list-style-type: none"> Cluster Plans Project Advisory Group 	<ul style="list-style-type: none"> 2x Track-1 clusters Project Union
Estimated resources	<ul style="list-style-type: none"> 2 FTEs to develop content for each project /application IT infrastructure and other administrative costs 	<ul style="list-style-type: none"> Secretariat for working groups (1 FTE) 	<ul style="list-style-type: none"> 3 FTEs to develop and maintain continuous communication between stakeholders
Required timeframes	<p>NEAR TERM (0-2 YEARS)</p> <ul style="list-style-type: none"> Government funding schemes already open to applicants e.g. Net Zero Hydrogen Fund. In order to develop shared business cases for current funding rounds collaboration frameworks need to be established soon 	<p>NEAR TERM (0-2 YEARS)</p> <ul style="list-style-type: none"> Better understanding of costs, performance and risks will ensure stronger business cases and put northern projects in a stronger position to access current funding pots 	<p>NEAR TO MEDIUM TERM (Next 5 years)</p> <ul style="list-style-type: none"> Hydrogen business models currently under development. Phase 1 clusters are developing skills and supply chain plans to support scale-up and meet demand

1.1 Supply side: Specifications of interventions

Intervention 1: Encouraging alignment, collaboration and information-sharing

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Better understanding of costs and performance of key technologies across projects
- Better understanding of key risks
- Identification of synergies which drive lower project cost
- Potential for Hydrogen business model design to better reflect the commercial priorities of Northern projects
- Better visibility around pipelines allows potential skills/supply chain bottlenecks to be anticipated and planned for across the region

Counterfactual



- Loss of competitive position and of investment options and sales
- Missed opportunities for UK economic impact (jobs, GVA) from H2 development and deployment
- Lack of confidence in private sector to invest; colleges, universities and training providers don't provide the skills development required to support the sector
- Lack of alignment between clusters reducing opportunities for scaling
- Reduced employment opportunities and lack of inward investment from overseas
- Slowed or reduced provision of skills pathways into the sector, slowing employment and disincentivising inward investment

1.1 Supply side: Specifications of interventions

Intervention 2: Supply chain mapping, gap analysis, and opportunities identification

Supply chain mapping and gap analysis

Identifying supply chain opportunities

What does this intervention involve?	<ul style="list-style-type: none"> • Work on clarity around funding and timing of UK project pipelines involving National Grid, UKRI, BEIS • Clarity around business models for supply side production, transmission and consumption, including heat and transport • Detailed mapping of existing supply chains, including opportunities for onshoring 	<ul style="list-style-type: none"> • Identification of supply chain inefficiencies, and opportunities to increase UK content • Collaborative definition of a H2 for the North prospectus, including demonstrator, supply chain and generation opportunities
What the North is already doing	<ul style="list-style-type: none"> • Energi Coast – regional supply chain mapping • Offshore Energy Alliance • North West Nuclear Arc 	<ul style="list-style-type: none"> • GM Business cohort of SME's who are developing a range of projects in the value chain • Offshore Energy Alliance & North West Nuclear Arc
Estimated resources	<ul style="list-style-type: none"> • 1 FTE for local partners to coordinate and set up project environment • Conduct supply chain analysis (1 FTE) 	<ul style="list-style-type: none"> • 1 FTE for public sector to coordinate • 1 FTE to analyse supply chains and identify opportunities
Required timeframes	<p>NEAR TERM (0-2 YEARS)</p> <ul style="list-style-type: none"> • Quick engagement is needed to ensure that the capabilities of the North are well reflected in the Net Zero strategies and project pipelines 	<p>NEAR TERM (0-2 YEARS)</p> <ul style="list-style-type: none"> • As the pipelines and business models for these technologies are being rapidly developed, a quick response is needed from the supply chain side to ensure competitive advantage

1.1 Supply side: Specifications of interventions

Intervention 2: Supply chain mapping, gap analysis, and opportunities identification

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Better understanding of supply chain needs and project timeframes
- A collaborative engagement with government will ensure that project pipelines and targets will reflect the capabilities of the whole region
- Identifying supply chain opportunities can enable focusing investment to areas with the most potential to grow
- Growth in local industries and first mover advantage through increased funding and investment from greater onshoring

Counterfactual



- Stagnating or decreasing UK content
- Extended supply chains causing delays in projects and rising transport costs
- Loss of competitive position and of investment options and sales
- Continued dependence on imported elements and demise of UK supply base
- Commodification of wind supply chain - loss of high value R&D and OEM activity to other nations, e.g. in Europe/China

1.1 Supply side: Specifications of interventions

Intervention 3: Exploit supply-side synergies

Encouraging co-location of hydrogen production with renewables and nuclear

What does this intervention involve?

- Alignment to the UK Hydrogen strategy and Energy Security Strategy
- Collaboration on low carbon Hydrogen standard

What the North is already doing

- Sellafield site – Cumbria
- Highview Cryobattery

Estimated resources

- Hydrogen production experts from NE and NW cluster (advisory)
- Resource support for cross cluster working groups driving ecosystem development around skills, innovation, regulation, funding etc

Required timeframes

MEDIUM TERM (3-5 YEARS)

- Coordinating offshore, nuclear and hydrogen production, and developing a shared infrastructure is a time-consuming task, so it has a potential in medium timeframes.

Shared Hydrogen Transport and Storage Infrastructure, and other low-carbon heat solutions

- Gathering 'evidence base' to understand demand and supply-side business models for pooling of resources to deliver low-carbon heating solutions at scale
- Joined up thinking on long-term viability of low-carbon heat options, and the investment pathways required to achieve these
- Coordinated approach to security of supply and hydrogen storage options across north including hydrogen grid development

- HySecure (hydrogen storage)
- Track-1 clusters & Project Union
- Seaham Garden Village (Minewater)
- Offshore Energy Alliance

- Setting up teams of experts to gather evidence on hydrogen sub-sectors

MEDIUM TERM (3-5 YEARS)

- This action will be particularly important to facilitate the roll out of green hydrogen at scale in the 2030s

1.1 Supply side: Specifications of interventions

Intervention 3: Exploit supply-side synergies

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Reduced costs and greater competitiveness of Hydrogen and CCUS
- Improving nuclear efficiency, making nuclear investments more viable
- Driving green electricity production and lowering carbon emissions
- Storage sites are identified and developed faster, enabling more hydrogen production in the near term

Counterfactual



- Missed opportunities for deployment – not recognising the whole system approach
- Higher energy production required in each cluster to ensure security of supply & risk of lack of supply due to storage not being developed
- Loss of the innovation opportunity of Green Hydrogen and Fuel Cells underpinned by the science asset base of the region

1.1 Supply side: Specifications of interventions

Intervention 4: Supporting increased funding and support for new technologies

Creating a shared 'Northern Voice' to represent common interests and agree funding priorities

Supporting new technologies such as tidal and floating wind, with a focus on integration with Hydrogen

What does this intervention involve?

- Influencing government collectively around funding and infrastructure requirements (e.g. to enable decarbonisation of heat and transport)
- Collaborative international trade, export, and inward investment targeting efforts, including smoothing exports and export licensing
- Joint creation of regional marketing materials for international markets to profile collective value proposition

- Northern sites used for demonstration projects for new technologies, with embedded local and industry leadership
- Sharing of learnings between demonstration projects in the North
- For projects nearing FID, ensure offtake agreements with green hydrogen projects

What the North is already doing

- Pan-Northern partnerships on the economy, transport, and housing, including the NP11, Transport for the North, Offshore Energy Alliance and the Northern Housing Consortium

- Developing business cases/establishing feasibility for new technologies and projects
- Two Innovation Launchpads and the Northern Innovation Accelerator Projects
- Various new-tech trials (e.g. Minewater at Seaham Garden Village)

Estimated resources

- Coordination of marketing activity (1 FTE)

- Negotiate commercial arrangements with green hydrogen projects (1 FTE)

Required timeframes

NEAR TERM (0-2 YEARS)

- Work on creating a shared representation can start early, after agreement has been reached on common interests.

MEDIUM TO LONG TERM (3-5+ YEARS)

- Due to the novelty of these technologies and innovation, the uptake of these solutions will be a longer process.

1.1 Supply side: Specifications of interventions

Intervention 4: Supporting increased funding and support for new technologies

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Cost reduction and learning
- Quicker roll-out of new technologies
- Local innovation makes Northern firms more competitive, driving increased local content, local investment, jobs, exports etc
- Creating new technologies to accelerate decarbonisation (i.e. hydrogen production) methods, establishing the North as a global leader in the energy transition

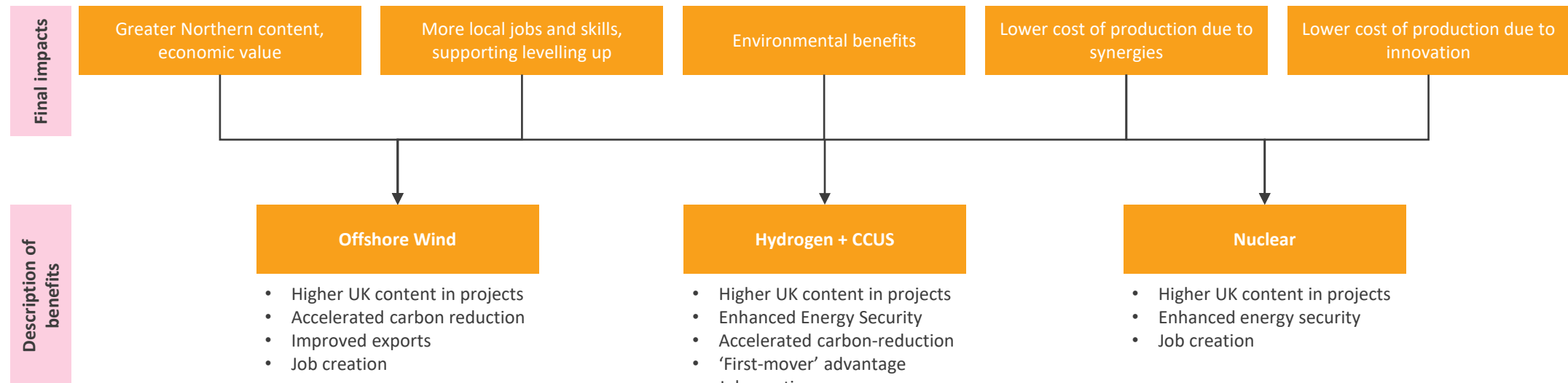
Counterfactual



- Reduced employment opportunities and lack of inward investment from overseas
- Loss of high value R&D and OEM activity to other nations, USA, China and Middle East
- Missed opportunity in exporting the knowledge and technology
- Slowed or reduced roll-out of innovations in technology such as larger turbines, floating turbines

1.1 Supply side: Benefits of collaboration

- In this section, we estimate the benefits that a more collaborative approach could unlock. We do not seek to estimate the benefits of each intervention individually, as the evidence base around benefits is not sufficiently granular to do this. In addition, multiple interventions could result in the same benefit e.g. higher UK content/economic value, such that estimating benefits separately for each intervention may lead to double counting. Benefits are therefore estimated on a technology-by-technology basis.
- There are some benefits which we have not been able to provide a monetised estimate for the scale of the impact: for these the benefits are described qualitatively.



1.1 Supply side: Benefits of collaboration



Estimating the benefits from collaboration – Offshore Wind

1. Benefits of increased UK content

- Goal to reach 30 GW capacity by 2030
- The average UK content on projects is currently 50%, the goal is to increase it to at least 60% by 2030
- About £40 billion of infrastructure spending is expected, so as of now around £20 billion of investment would land overseas
- Estimating that the share of the North in the supply chain is around 40% (initial estimate based on number of OSW supply chain firms in North)

With 50% UK content by 2030

£40 bn of investment $\times 50\% =$ £20 bn of UK content $\times 40\% =$ £8 bn of Northern investment

With a potential of 60% UK content by 2030

£40 bn of investment $\times 60\% =$ £24 bn of UK content $\times 40\% =$ £9.6 bn of Northern investment

£ 1.6bn increase

- Given the scale of investment in offshore wind that the UK requires, increasing UK content will drive large economic benefits

1.1 Supply side: Benefits of collaboration



Estimating the benefits from collaboration - Hydrogen & CCUS

1. Benefits of increased UK content

- £41bn of project expenditure expected by 2035
- Currently estimated 50-60% UK content for onshore energy projects, and offshore projects in the North Sea are targeting a 30% UK technology spend
- Around 85% of total expenditure on the deployment of CCUS and hydrogen is expected to be onshore in power generation, industrial capture, and hydrogen production plants
- Share of UK investment in these projects in the North is estimated to be around 50%

With current UK content %, by 2030

£35 bn of onshore investment	x 55% =	£19.25 bn of UK content	x 50% =	£9.6 bn of Northern investment	£2.07bn increase
£6 bn of offshore investment	x 30% =	£1.8 bn of UK content	x 50% =	£0.9 bn of Northern investment	

With 10% higher UK content by 2030

£35 bn of onshore investment	x 65% =	£22.75 bn of UK content	x 50% =	£11.37 bn of Northern investment	£2.07bn increase
£6 bn of offshore investment	x 40% =	£2.4 bn of UK content	x 50% =	£1.2 bn of Northern investment	

1.1 Supply side: Benefits of collaboration



Estimating the benefits from collaboration - Nuclear

1. Benefits of increased UK content

- Government intends to deploy up to 24GW nuclear power by 2050.
- Of the 8 designated sites, 3 (Heysham, Hartlepool, Moorside) are located in the region
- 8 x 3GW new nuclear power stations in the region would require around £100bn investment¹
- We assume that 3/8 of the nuclear supply chain is based in the North (based on its share of new sites)
- Below we set out the scale of benefits if UK content in nuclear projects in the North increased by a further 5%:

With current UK content % by 2050

£100 bn investment x 60% = £60 bn of UK content x 3/8 = £22.5bn of Northern investment

With 5% higher UK content by 2050

£100 bn investment x 65% = £65 bn of UK content x 3/8 = £24.4bn of Northern investment

£ 1.9bn increase

¹ BEIS, Generation Costs Update, pre-development + construction capex estimated at £40bn for new nuclear

1.1 Supply side: Benefits of collaboration



Estimating the benefits from collaboration – Other Benefits (1/2)

Other benefits

- Cost-reductions through lower production costs, guaranteed offtakers, and innovation.
- ‘First mover advantage’ through greater innovation and risk-taking, supporting the North to become a net energy exporter.
- Job creation, and improved productivity, achieved through greater investment in innovation, R&D, skills.
- Environmental benefits (carbon-reduction) from accelerated decarbonisation of supply chains and reduction in transport emissions.

These are set out in greater detail in the table below:

Benefit type	Nature of impacts	How collaboration unlocks these benefits	Evidence around benefits	Relevant sectors
Cost reduction	<ul style="list-style-type: none"> • Shortened supply chains reduce costs related to transport during installation and O&M • Higher learning rates, leading to lower capital and operating expenditure • Lower cost of hydrogen production due to shared infrastructure benefits • Guaranteed offtakers for low-carbon electricity • Innovation driving cost reduction: scaled-up electrolyzers with increased stack manufacturing have significant impacts on cost 	<ul style="list-style-type: none"> • Collaboration around improving the supply chain, identifying gaps • Working across the region to secure more innovation funding will drive cost reduction in the long-term • Creating a ‘shared infrastructure’ between low-carbon electricity and hydrogen projects will drive down fuel costs 	<p>Offshore Wind Innovation Hub: Operations & Maintenance: Cost Drivers:</p> <ul style="list-style-type: none"> • The 19 innovation areas reviewed in this study were found to have the potential to reduce O&M costs by 15% for a current fleet wind farm and by 11% for a next generation fleet wind farm <p>BEIS analysis of green hydrogen production costs:</p> <ul style="list-style-type: none"> • Significantly lower levelised cost of production for projects using dedicated offshore electricity or curtailed electricity: LCOH above £150/MWh for projects buying electricity at industrial retail price, versus LCOH around £50/MWh for projects using curtailed electricity. 	<ul style="list-style-type: none"> • Offshore wind • Hydrogen & CCUS • Nuclear

1.1 Supply side: Benefits of collaboration



Estimating the benefits from collaboration – Other Benefits (2/2)

Benefit type	Nature of impacts	How collaboration unlocks these benefits	Evidence around benefits	Relevant sectors
Increased exports	<ul style="list-style-type: none"> • ‘First mover advantage’ achieved through accelerating innovation • Coordination around freeports to maximise opportunity • Cost-reductions and higher standards increase international competitiveness 	<ul style="list-style-type: none"> • Supply chain improvements increase competitiveness and boost output for local firms • Enhanced investment, especially in innovation/R&D gives local firms a chance to gain a competitive advantage. 	<p>Ongoing innovation in the sector is driving cost reduction and producing exportable goods and services. Investment in the UK supply chain also increases export opportunities for the industry.</p> <p>By 2030, there are Sector Deal ambitions to increase exports fivefold from £ 0.82 bn/yr to £ 2.6 bn/yr</p>	<ul style="list-style-type: none"> • Offshore wind • Hydrogen & CCUS
Jobs/upskilling	<ul style="list-style-type: none"> • Direct jobs (construction and operation) • Employment of local workers • More skilled workers 	<ul style="list-style-type: none"> • Upskilling of workers (training and apprenticeships) • Redirecting the workforce from declining sectors • More cooperation allows better long-term visibility on skills requirements 	<ul style="list-style-type: none"> • The Offshore Wind Sector Deal highlights opportunities to create 27,000 direct jobs by 2030 and supporting at least 60,000 total jobs in the sector • 20GW of CCGT/CCUS capacity estimated to create annual employment for 30,000 people. • According to the Hydrogen Strategy, UK-wide hydrogen economy can create over 9,000 high-quality jobs by 2030 	<ul style="list-style-type: none"> • Offshore wind • Hydrogen & CCUS • Nuclear
Environmental	<ul style="list-style-type: none"> • Smaller carbon footprint during installation, construction, operation and maintenance • Emission reduction due to increased availability of renewable electricity • Local projects reduce energy transportation losses 	<ul style="list-style-type: none"> • Greater local content will reduce miles in the supply chain, resulting in lower emissions from transport and maintenance vehicles 	<p>Carbon Footprint Assessment for the Norfolk Boreas Offshore Wind Farm:</p> <ul style="list-style-type: none"> • Carbon emissions related to marine vessels and road traffic vehicles during the construction phase amount to around 9% of the total carbon emissions of installation <p>Sizewell B project (Climate Change Statement):</p> <ul style="list-style-type: none"> • EDF’s Climate Change Statement for Sizewell C breaks down the carbon content of construction at 5.74m tCO₂, of which 5% is due to materials transport and 5% worker transport, i.e. 574,000 tCO₂ is transport emissions. 	<ul style="list-style-type: none"> • Offshore wind • Hydrogen & CCUS • Nuclear

NP11



1.1 | Supply side

1.2 | Demand side

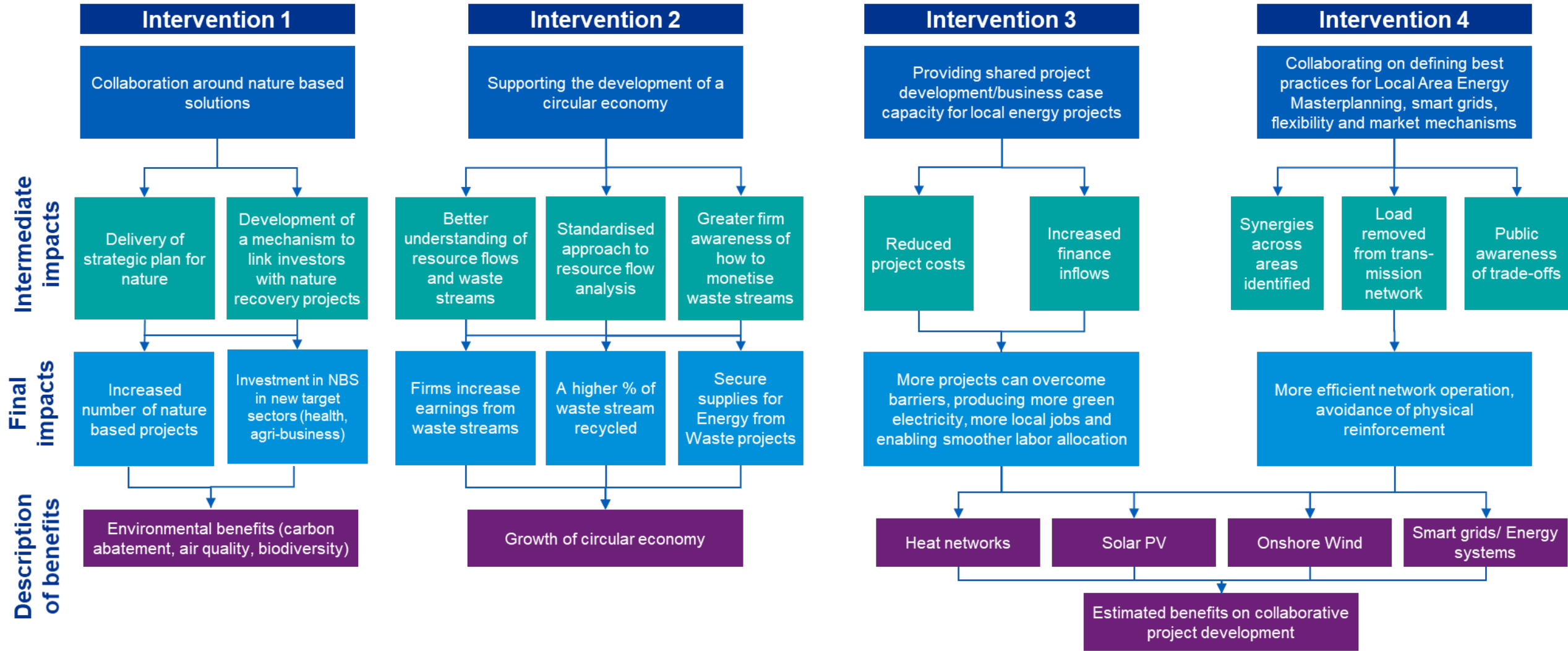
- Specification of interventions
- Benefits of collaboration

1.3 | Skills/Supply chain

Economic Analysis



1.2 Demand side: Specification of interventions



1.2 Demand side: Specification of interventions

Intervention 1: Collaboration around nature based solutions

Develop a strategic plan for nature & develop a common benefits valuation framework

What does this intervention involve?

- Organisations in the North of England working together to capitalise on the opportunities presented by nature based solutions and investment.
- Establish a joint approach and development of strategic investment plan for nature
- Develop the evidence around benefits of nature based solutions to support business cases and funding applications
- Creating opportunities to engage with potential demand-side investors in new target sectors e.g. the health sector (mental health aspect of natural capital investments), and agri-business (farming)

What the North is already doing

- Circular Yorkshire Work Programme
- Nature North partnership, e.g.:
 - **Great Northern Forest:** Target to plant 50 million trees, spanning from Liverpool to Hull, by 2043
 - **Great North Bog:** Targeting increasing peatland restoration and conservation across 700 square KM

Estimated resources

- 1 additional FTE to map and engage with investors in new target sectors

Required timeframes

SHORT TO MEDIUM TERM (1-5 YEARS)

- 2 – 3 years: Development of a common benefits framework (e.g. carbon sequestration) and a mechanism to link investors with nature recovery projects
- 3 – 5 years: Development of a strategy to align the North's potential to deliver impactful, at scale nature based solution with a portfolio funding opportunities
- 3 – 5 years: Delivery of at scale nature recovery interventions with measurable impact and nature based solutions fully integrated.

Case Study: Nature North

Nature North provides an exemplar framework for collaboration that can be across the whole of the region.

Nature North's role includes:

Policy: A joint, strategic plan for investment in large-scale nature recovery in the North of England and embedding nature and its benefits across policy areas (planning, transports, net zero etc.) for green growth and climate resilience

Propositions (for investment): Accelerate and increase investment in nature based solutions (nature recovery) from both public and private sources

Partnership: An inclusive Northern community for nature recovery, incorporating the private, public and third sector can achieve more together.

1.2 Demand side: Specification of interventions

Intervention 1: Collaboration around nature based solutions

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Increased understanding and awareness of nature based solutions, development of collaborative nature based projects and momentum
- Collaboration between public, private and third sector drives more sustainable funding models for the sector
- Collaboration drives greater confidence in the sector to build capacity to meet the needs of a new and expanding market
- Collaboration accelerates the spread of innovative funding models
- Better information and knowledge sharing drives more projects, which leads to widespread environmental, social and wellbeing benefits for citizens and communities in the region

Counterfactual



- Underfunded and unfeasible projects
- Delayed projects, which can have detrimental effects for nature based solutions, nature recovery, climate resilience and green growth
- Lost opportunities for possible synergies due to lack of knowledge sharing in key technologies and areas
- Lost opportunities to build confidence of the sector in new and expanding market through collaboration

1.2 Demand side: Specification of interventions

Intervention 2: Supporting the development of a circular economy

Optimising waste resource flows, facilitating greater reuse of waste streams across borders

Create a list of market mechanisms

What does this intervention involve?

- Identifying opportunities for businesses to manage and secure project materials
- Establish scope for building markets based on end-of-life recovery of materials from clean growth technologies (e.g. EV batteries, solar panels)
- Studies to improve understanding of commercial waste streams across the region
- Facilitate the reuse of greater volumes of commercial waste, creating opportunities to scale up operations and create economies
- Building contacts between waste/resources offtakers and local authorities/commercial waste producers in different areas

- Surveying Local Authority waste management strategies and circular economy approaches to create a comprehensive database of market mechanisms in the region
- Engage around database with firms across the region, helping them to identify where economic value streams for their waste can be realised, and how they can participate in market mechanisms to promote the circular economy.
- Facilitation of contact between firms and market operators as required

What the North is already doing

- BECCS (Drax)
- REnescience Northwich
- Peel Environmental
- Waste2Tricity
- Pensana (the Humber)

- Biomass/Bioenergy
- Waste plastic to hydrogen
- Waste to aviation fuel

Estimated resources

- 1 - 2 FTEs to keep track of the process and the data flow
- 1 - 2 FTEs to gather and handle data on local market mechanisms and to keep contact with key industry stakeholders
- Commercial waste streams study: 2 FTEs
- 2 FTEs to assist commercial organisations to identify recycling routes

- 1 -2 FTE to gather and handle data on local market mechanisms and to keep contact with key industry stakeholders
- Waste Management experts to analyze opportunities

Required timeframes

MEDIUM TERM (3-5 YEARS)

- The resource-flow model is likely to be complex, and information about private sector flows is currently patchy.
- Engagement and the building of commercial networks will require a better understanding of commercial waste streams

NEAR TERM (0-2 YEARS)

- No major dependencies, the creation of a comprehensive list of market mechanisms can be done quickly, with engagement with the market following the study

1.2 Demand side: Specification of interventions

Intervention 2: Supporting the development of a circular economy

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Development of key supply chains, enabling the development of a circular economy – providing high quality jobs and new business opportunities
- Development of market demand for circular economy products and services
- Increased support available for SMEs to adopt CE principles
- Accelerated pace and scale of industry change
- More commercial waste recycled and reused- lower landfill volumes
- Greater volumes of commercial waste allow opportunities for upscaling and innovation in waste management and circular economy
- Recycling offers alternative, secure supply of materials for firms facing global supply chain uncertainty (e.g. batteries)
- Inter-area waste handling agreements are delivered smoothly, generating confidence in this market
- Greater recycling/reuse of commercial waste streams allows for upscaling/economies of scale in waste management operations

Counterfactual



- Inefficient use of resources, with higher proportion of waste going to landfill or incinerated
- Missed opportunities to reuse and recycle greater volumes of commercial waste
- Missed opportunity to create scale in waste management/circular economy
- Firms lack alternative sources for key materials, or are unable to monetise their waste streams
- Duplication of effort
- Inconsistently comparable outputs

1.2 Demand side: Specification of interventions

Intervention 3: Providing shared project development/business case capacity for local energy projects and decarbonised heat/transport

Building capacity into business case development

<p>What does this intervention involve?</p>	<ul style="list-style-type: none"> • Net Zero Hubs sharing information on project delivery and identifying opportunities for joint delivery • Developing project pipelines to support aggregation to attract green finance from e.g. UK Infrastructure Bank • Sharing operational experiences and data to ensure future business cases underpinned by robust data, in particular for transport and energy efficiency projects, as well as use of novel energy sources e.g. minewater heating • Sharing learnings from initial cluster-based businesses to support decarbonisation outside of clusters • Collaborative procurement/financing routes for key project components/services to enable economies of scale and help innovative projects achieve commercialisation
<p>What the North is already doing</p>	<ul style="list-style-type: none"> • Work of Net Zero Hubs • Gateshead minewater energy scheme
<p>Estimated resources</p>	<ul style="list-style-type: none"> • 1.5 FTE to identify and manage opportunities on joined delivery • Cost of organising knowledge sharing events • OPEX/time input from stakeholders to shape opportunities for joined delivery and collaboration
<p>Required timeframes</p>	<p>NEAR TERM (0-2 YEARS)</p> <ul style="list-style-type: none"> • This can be achieved in a relatively short time period, to ensure more projects can be launched as soon as possible

1.2 Demand side: Specification of interventions

Intervention 3: Providing shared project development/business case capacity for local energy projects and decarbonised heat/transport

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Reduction in pre-development costs
- Increased number of jobs in local supply chains
- Improvement in skills: more skilled workers in local area, improving project efficiency and employment rate
- Avoid delays on projects due to labour shortages

Counterfactual



- Projects incur higher development costs due to lack of knowledge sharing
- Projects ignore the opportunity of integrating low carbon heating systems
- Additional (longer-term) retrofit costs required in the future to upgrade projects to low carbon heating systems
- Technologies not scaled-up at rate required to drive costs down, leading to a less diverse technology mix
- Higher project costs than if economies of scale are leveraged for project financing, procurement etc.
- Slower deployment of new technologies/approaches in local projects, e.g. mine /geothermal energy

1.2 Demand side: Specification of interventions

Intervention 4: Local area energy master planning

Northern Energy master planning

Feeding into networks' work on developing smart grids and flexibility

What does this intervention involve?

- Collaboration on developing a shared Northern Energy Plan which:
 - Captures cross-border interactions - how can different areas drive synergies from adjoining infrastructure?
 - Identifies optimal ways to link supply and demand in different regions
 - Analyses the impact local generation has on DNOs, and ways to remove load from transmission network, particularly in relation to heat
- On the back of the Plan, collaboration around formulating a joined-up vision between local areas, National Grid and DNOs to take pressure of existing networks
- Collaboration around public engagement, in particularly where there can be a pay off against delays in the planning process
- Knowledge transfer/carbon literacy for communities, councilors, across themes (planning, insetting, generation)

- Smoother and more tactical interactions with wider stakeholders (e.g. DNOs & Govt), leading to coordination of investment and net zero acceleration.
- Collective identification of sectors which should be targeted for international/national supply chain investment and trade, leading to action planning to deliver together
- Ensure joined up work with the networks, while promoting the One Northern Voice during the business planning phase

What the North is already doing

- Community Renewal Fund
- Work of Net Zero Hubs

- HPO Programme – Heat Networks
- GM Go Neutral Smart Energy Framework

Estimated resources

- 1 FTE plus specialist modelling to create Plan
- Public engagement around the plan, including dedicated resource in the public sector to participate in DNO consultations

- 1 FTE to handle stakeholder interactions (mainly with network operators)
- Cost of creating and maintaining a shared northern voice on networks

Required timeframes

NEAR TO MEDIUM TERM (1-5 YEARS)

- Quick wins can be achieved in short term, however to set up best practices which can work for a longer period of time for most Northern Areas will take time.
- Network engagement will also require alignment with future price control periods (RIIO-3).

NEAR TO MEDIUM TERM (1-5 YEARS)

- After a shared northern voice is developed a continuous joined up work with networks can start fairly soon.

1.2 Demand side: Specification of interventions

Intervention 4: Local area energy master planning

Why this intervention is needed/what will happen without it?

Benefits of collaboration



- Networks can avoid expensive reinforcement costs
- Local Authorities will have a clear view of future energy in needs in their area, and a pathway towards decarbonisation
- Local Authorities have a clear pipeline of future projects to communicate to the private sector
- Local energy sources take pressure off the transmission grid, which needs to expand to accommodate new large-scale technologies (offshore wind, nuclear)
- Synergies are exploited where possible e.g. industrial waste heat used in heat networks
- Communities are more informed of the challenges of low-carbon energy planning and potential solutions
- More jobs in the growing flexibility/smart energy services market

Counterfactual



- Limited heat network take up leads to need for additional reductions elsewhere
- Increased reliance on fossil fuel heating (and potential corresponding energy cost/cost of living crisis implications)
- Missed opportunities to leverage national funding into Northern projects
- Missed opportunities to more proactively meet skills needs collaboratively for the sector

1.2 Demand side: Benefits of collaboration

- In this section, we estimate the benefits that a more collaborative approach could unlock. We do not seek to estimate the benefits of each intervention individually, as the evidence base around benefits is not sufficiently granular to do this. In addition, multiple interventions could result on the same benefit e.g. higher UK content/economic value, such that estimating benefits separately for each intervention may lead to double counting. Benefits are therefore estimated on a technology-by-technology/sector basis.
- We have estimated the potential benefits for the following technologies/sectors (these sectors were selected based on their relative importance in the British energy security strategy) based on the evidence available:
 - **Generation technologies** (Solar PV and onshore wind): these have been included as it is the most feasible, easy-to-deliver option for local authorities and communities, whose projects will stand to benefit most from increased collaboration and knowledge sharing.
 - **Heat Networks**: this has been included as there is considerable scope for different areas to share learnings around developing this projects, particularly for novel technologies where the North has high technical potential e.g. mine projects.
 - **Circular economy**: we have estimated the potential benefits from collaboration by looking at the benefits from reducing waste to landfill, focusing on commercial waste streams rather than municipal waste streams where landfill rates have already been considerably reduced.
 - **Smart Grids/energy systems**: we have compared the benefits from a 'local' network optimisation approach to that for a 'whole system' optimisation approach.
 - **Nature based solutions**: we have estimated benefits for two of the largest nature based projects currently happening in the North, based on a recent study which implicates benefits from carbon sequestration and recreation for woodland and peatland restoration projects.
- There are other technologies which may also generate benefits from a more collaborative approach. The numbers presented here should therefore be treated as indicative of the scale of benefits which could be realised.
- There are some benefits which we have not been able to provide a monetised estimate for the scale of the impact: for these the benefits are described qualitatively.

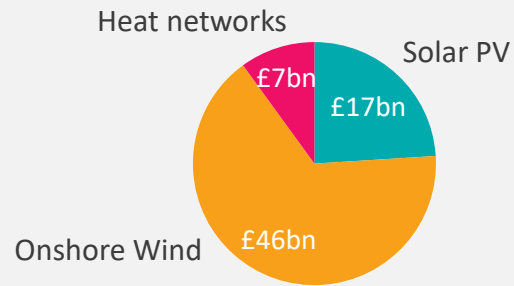
1.2 Demand side: Benefits of collaboration



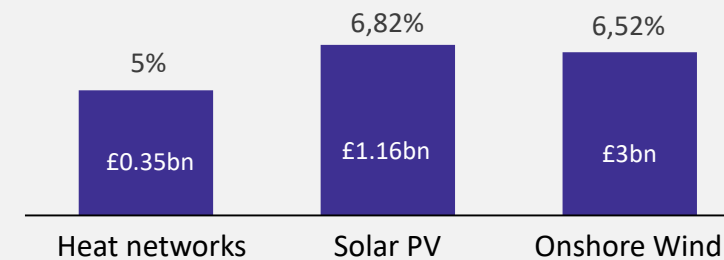
Estimating the benefits from collaboration – local energy projects

- Below we set out our method and results for estimating an indicative scale of benefits in relation to local energy projects. These are based on the assumption that most scope for benefits from collaboration is in relation to project pre-development costs rather than in actual project delivery.

Estimated market size /investments in the next 10-15 years



Pre-development cost estimates (in % of total investment costs)¹



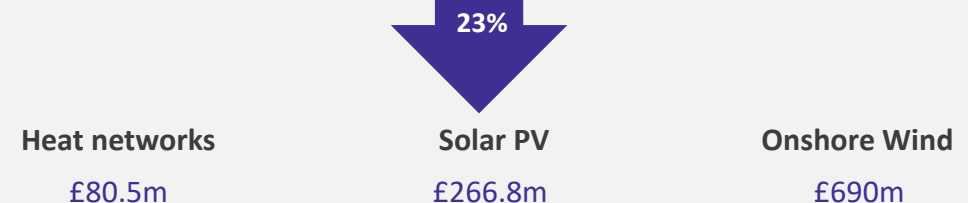
Estimated savings due to collaborative action

Based on available sources, we could estimate that collaboration can lead to around 65% savings in pre-development or procurement costs on average by project.²

Heat networks	Solar PV	Onshore Wind
£52.3m	£168m	£448.5m

Estimated total savings due to collaboration: £668.8m

Pro-rata estimates for the North (weighted by population %)



¹ BEIS: Electricity Generation Costs 2020

² london.gov.uk : Collaborative Procurement Savings Tracker

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Smart Grids/energy systems

Benefits of a joined up approach to system optimisation

- A Carbon Trust/Imperial College study¹ highlights that pressure to ensure that energy costs are minimised for the local population may mean that the value of additional investment which could lead to savings at a wider system level is not recognised.
- The study focused on the Greater London area and compared a ‘whole system optimisation’ scenario with a ‘local system optimisation’ scenario. In the whole system scenario, the model was constrained to minimise investment in distribution networks, rather than minimise costs across the whole system.
- Comparing the two scenarios, a local optimisation approach is £600m/yr more expensive at a GB level.
- This study provides an indication of the scale of benefits that could be achieved if the different parts of the North adopt a collaborative approach to energy systems planning. Although the modelling results are specific to the particular characteristics of the energy system in the Greater London area, energy networks in the North of England serve more customers (the population of the region is approximately 15m opposed to 9m in London), indicating that benefits of a similar scale could be achieved.

¹ Carbon Trust, Imperial College (2021), ‘Flexibility in Great Britain’

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Circular economy

Benefits of more efficient waste management in the industrial and commercial sector

- As outlined in the intervention specification, the main intention of this intervention is to allow a more sustainable use of industrial and commercial (I&C) waste streams.
- In comparison to municipal waste, data collection around I&C waste is less reliable and granular. The Government's Waste Management Plan for England (2021) estimated business recycling at approximately 43%.
- The Waste Management Plan has the target of recycling 65% of municipal waste by 2035.
- Volumes of I&C waste are estimated at 34m tonnes (2020 figures, source: UK statistics on waste data (2022))
- Weighting by population gives a North of England waste volume of $34\text{m} * 23\% = 7.82\text{m}$ tonnes
- To provide an indication of benefits, we assume that collaboration around I&C waste streams allows recycling rates to reach 65% by 2035 from current levels. This would imply an additional 1.72m tonnes being recycled.
- The monetisable benefits of this will depend on:
 - How the waste would be disposed otherwise (e.g. landfill)
 - The costs of recycling (which will depend on the nature of the waste and available treatments)
- Estimates in the public domain suggest that landfill is around two times more expensive than recycling. Given the current rate of landfill tax of £98.60/tonne, this suggests a saving of £50/tonne, and a total saving of **£86m** per year by 2035. Assuming a constant trajectory of increased recycling, this would generate total savings of **£560m** over the 2023-35 period.

¹ Biffa, 'The Reality Gap' (2017)

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Nature based solutions (NBS)

Benefits of more nature based solutions

- A recent report from the RSPB has estimated that investing in peatlands as an NBS would generate benefits of approximately £4.60 for £1 spent, which includes benefits from carbon sequestration and recreation. Investing in woodlands would generate benefits of around £2.80 for every £1 spent, which also includes benefits from carbon sequestration, recreation and improvements in air quality.¹
- It has been estimated that potential investment in the Great North Bog (an ambitious, grand-scale peatland restoration initiative, a landscape approach to restoration across nearly **7 000 square kilometres (700 000 hectares)** of upland peat in the Protected Landscapes of northern England, could amount to £200m over 20 years according to development partners.²
- The partnership behind the ambitious development of The Northern Forest estimates that it will cost around £500 million to develop the Northern Forest over the next 25 years, in an area of about **25 900 square kilometres (2 590 000 hectares)**.³

Estimating benefits for The Great North Bog

Potential investment of **£200 million**² x **4.6** (applied cost-benefit ratio) = **£920 million**

Estimating benefits for The Northern Forest

Potential investment of **£500 million**³ x **2.8** (applied cost-benefit ratio) = **£1.4 billion**

¹ British Ecological Society (2021): Nature-based Solutions For Climate Change In The UK

² Moorsforthe future.org.uk

³ Thenorthernforest.org.uk

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Other Benefits (1/3)

Other benefits

- Job creation and improvements in productivity through greater investment and innovation.
- Improved energy security through increased, local production.
- Reductions in consumer bills through installation of low-carbon energy and improved energy efficiency.
- Carbon-savings from improving efficiency of resource-flows, and higher uptake of low-carbon fuels and solutions.
- Improvements in water quality, and flood-water management through NBS.

These are set out in greater detail in the table below:

Benefit type	Nature of impacts	How collaboration unlocks these benefits	Evidence around benefits	Relevant sectors
Jobs/upskilling	<ul style="list-style-type: none"> • Installation provides opportunities for workers with transferable skills e.g. electricians, while ongoing O&M will also require this technical skillset • Construction jobs to deliver new heat networks • Creation of new employment delivering smart systems and flexibility solutions • O&M jobs to maintain new systems • Jobs associated with the development and upkeep of nature based solutions, and the upskilling associated with these new roles, will drive benefits in the local workforce. 	<ul style="list-style-type: none"> • Through knowledge sharing, more local/community projects can be developed, increasing employment • Enabling more projects to happen, reducing costs around predevelopment, providing required skills • Collaboration promotes smart systems as an alternative to network reinforcement, allowing for innovation and scale • Collaboration will drive a greater scale of nature based projects, increasing job creation 	<ul style="list-style-type: none"> • Increasing solar capacity from the current levels to 40-50 GW by 2030 and 70 GW by 2035 would create around 20,000 jobs in the industry, of which 13,000 in the next decade • Similar scale of employment is likely for onshore wind: in a scenario with 35GW capacity by 2035, 30,000 jobs would be supported • The potential growth in heat networks will contribute to the creation of an estimated 46,400 to 63,400 new jobs annually across the UK • BEIS 'Energy Innovation Needs Assessment': (2019): domestic market for flexibility services could support £1.3bn GVA and 10,000 jobs by 2050. 	<ul style="list-style-type: none"> • Generation technologies (Solar PV and onshore wind) • Heat networks • Smart Grids/energy systems • Nature based solutions

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Other Benefits (2/3)

Benefit type	Nature of impacts	How collaboration unlocks these benefits	Evidence around benefits	Relevant sectors
Environmental	<ul style="list-style-type: none"> Emission reduction due to increased availability of renewable electricity Local projects reduce electricity transportation losses Energy savings from reduced gas imports, and reduced carbon emissions Reduced carbon emissions from landfill Higher recycling rates 	<ul style="list-style-type: none"> Knowledge sharing and collaboration allows more projects to be developed, increasing the environmental benefits Efficient resource flows and market mechanisms can encourage recycling, thus leading to less landfill usage and energy savings in production 	<ul style="list-style-type: none"> It is estimated that solar PV alone could reduce emissions by 4.7% in the current decade (2020-2030) There is evidence that well-designed and well managed solar can support wildlife habitats and meaningfully contribute to achieving national biodiversity targets Heat networks can deliver up to 5.7MtCO2 emissions reduction in residential and non-residential buildings by 2030 Landfill is a significant source of emissions, and currently accounts for 14m tonnes of CO2 annually 	<ul style="list-style-type: none"> Generation technologies (Solar PV and onshore wind) Heat networks Energy from Waste /Circular economy
Reduced expenditures for customers	<ul style="list-style-type: none"> Installing solar panels can lead to substantial reduction in annual electricity expenditures Local wind and solar PV projects can increase local energy resilience, and protect fuel poor residents from fossil fuel price fluctuations Introducing heat networks can lead to substantial reduction in annual heating expenditures 	<ul style="list-style-type: none"> More widespread deployment, especially on local authority owned homes, allows more consumers (including the fuel poor) to benefit from these savings Collaboration can facilitate more projects, unlocking greater overall benefits for consumers. 	<ul style="list-style-type: none"> In total a financial benefit of between £550 and £800 per year can be expected (depending on energy use) for domestic customers with solar PV. 4kW PV systems currently retail starting from £5,000 installed so a PV system will pay for itself in 5-10 years. Heat network customers pay, on average, £100 less annually than gas customers 	<ul style="list-style-type: none"> Generation technologies (Solar PV and onshore wind) Heat networks
Energy Security /efficiency	<ul style="list-style-type: none"> Reduced reliance on foreign gas imports Less exposure to fossil fuel price movements Less flexible fossil fuel generation required, reducing emissions EfW producers can have higher fuel intake, increasing production efficiency Additional revenue streams for waste producers 	<ul style="list-style-type: none"> By bringing more projects forward, collaboration helps reduce the exposure of households and businesses to fossil fuel price movements Local sources of heat supply and flexibility capabilities are exploited and remove demand from National Grid 	<ul style="list-style-type: none"> See above: solar PV and onshore wind generation reduces demand for gas. Carbon Trust/Imperial College 'Flexibility in Great Britain' report (2021): deployment of additional flexibility could displace 90GW of unabated gas generation in a fully electric scenario. EfW plants in the North in 2020 in average were operating with 83% efficiency 	<ul style="list-style-type: none"> Generation technologies (Solar PV and onshore wind) Smart Grids/energy systems Energy from Waste /Circular economy

1.2 Demand side: Benefits of collaboration



Estimating the benefits from collaboration – Other Benefits (3/3)

Other benefits

There is not sufficient evidence to make quantitative estimates of the other benefits collaboration could bring. Below we set out indicators of the scale of impact that could be unlocked:

Benefit type	Nature of impacts	How collaboration unlocks these benefits	Evidence around benefits	Relevant sectors
Export value	<ul style="list-style-type: none"> Building on skills and expertise in UK markets, UK firms can export to service other markets 	<ul style="list-style-type: none"> Early adoption of smart/flexibility solutions in the North will help drive scale and innovation, giving UK firms a competitive advantage 	<ul style="list-style-type: none"> BEIS 'Energy Innovation Needs Assessment' (2019): exports of smart system equipment and services could support £2.7bn GVA and 14,000 jobs by 2050. 	<ul style="list-style-type: none"> Smart Grids/energy systems
Improvement of water quality	<ul style="list-style-type: none"> Peat soils have water regulating properties and up to 70% of UK drinking water is sourced from catchments dominated by peatland habitat 	<ul style="list-style-type: none"> Collaboration can maximise these benefits by creating scale in the development of peat projects 	<ul style="list-style-type: none"> Improved water quality can be valued in monetary terms using the avoided cost method, i.e. how much it would cost to treat that water with an existing treatment system. 	<ul style="list-style-type: none"> Nature based solutions
Improved flood water management	<ul style="list-style-type: none"> Peatland vegetation slows the flow of rainfall, and the habitat's natural ability to store water can play a role in regulating both peak flows during flooding and base flows during dry spells, preventing flooding in local towns and villages. 	<ul style="list-style-type: none"> Collaboration can maximise these benefits by creating scale in the development of woodland projects 	<ul style="list-style-type: none"> The monetary value of reduced flood risk can be determined using the avoided cost method, i.e. using the costs of damage to properties and possessions of flooding as a proxy. 	<ul style="list-style-type: none"> Nature based solutions

NP11



1.1 | Supply side

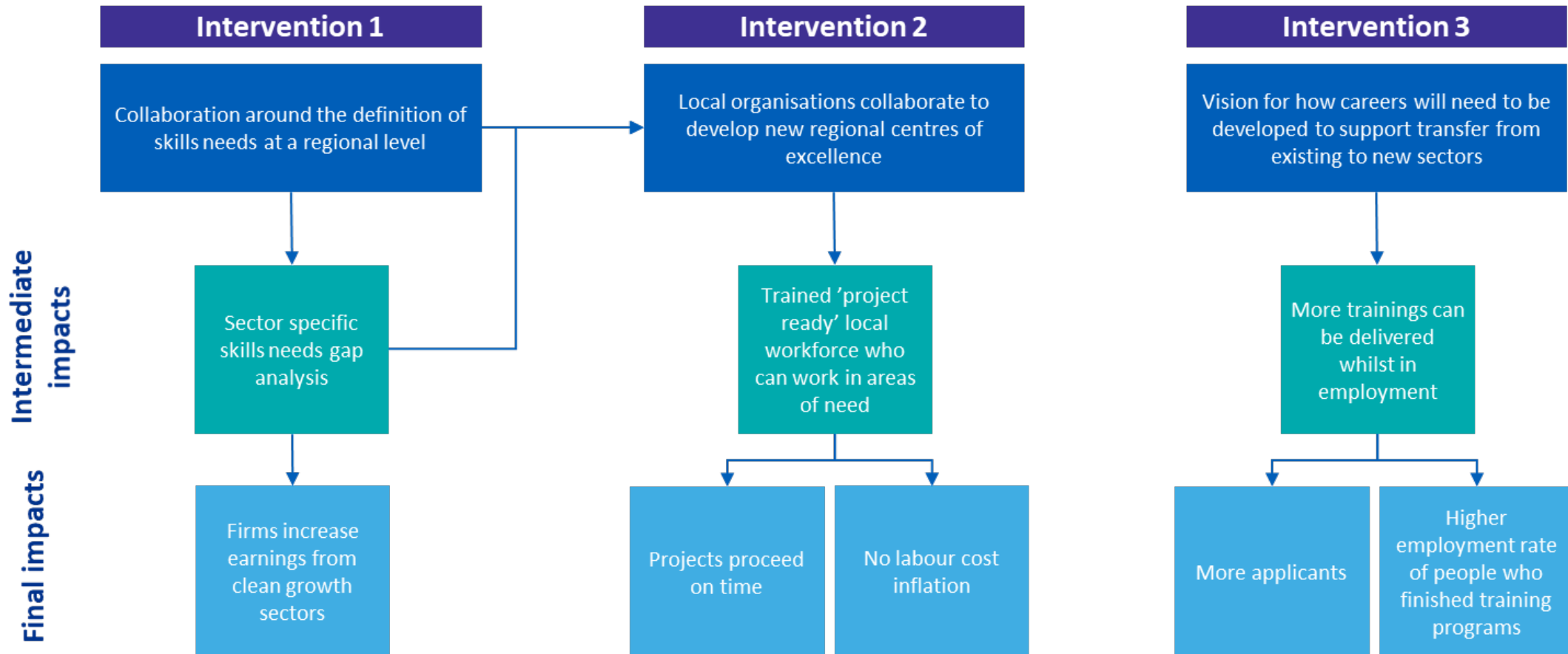
1.2 | Demand side

1.3 | Skills

➤ Specification of interventions

Economic Analysis

1.3 Skills: Specification of interventions



1.3 Skills: Specification of interventions

Intervention 1: Collaboration around the definition of skills needs at a regional level

What does this intervention involve?

- Work with local authorities, education providers and central government to understand training requirements across the region, especially in new/emerging sectors, creating a better funding case for the creation of new courses and qualifications
- Identify common skills requirements and gaps across the North, and examples of best practice in the current delivery of skills training by local partners
- Collaborating around understanding the national and northern position on skills demand both in terms of direct demand for new and transferable skills within the clean growth supply chain (including service sectors as well as engineering design, construction and operation)
- Increased engagement with community and education profession to explain opportunities

What the North is already doing

- Energi Coast Skills Group – North East LEP
- North West Energy & Hydrogen Cluster skills roadmap

Estimated resources

- 1 FTE to identify training requirements and skills needs for the local area

Required timeframes

NEAR TERM (0-2 YEARS)

- Work on this intervention can start as soon as possible, with potential achievements reached in the short term

1.3 Skills: Specification of interventions

Intervention 2: Local organisations collaborate to develop new regional centres of excellence

What does this intervention involve?

- Increased strategic collaboration with government on skills
- Leveraging new funding into the region for skills/better coordinated investment in new skills provision/facilities and other assets
- Identifying current capacity constraints and their economic impact particularly in specialist areas
- Agree best location for specialist centres of excellence or facilities, including collaborative delivery models

What the North is already doing

- Newcastle College & Port of Blyth Vocational Training Centre
- NzN Skills Alliance

Estimated resources

- 1 FTE to coordinate local organisations developing center of excellence
- Cost of experts to facilitate content development

Required timeframes

NEAR TO MEDIUM TERM (1-3 YEARS)

- After the necessary assessment of regional skills needs and skills gap analysis is completed, new regional centres of excellence can be located and developed accordingly

Case Study: NzN Skills Alliance

The N8 Research Partnership has launched the NzN Skills Alliance. The Alliance is a collaboration between FE, HE and the private sector in the North to align the needs of businesses in shifting to a low-carbon economy, and the skills offer of educational institutions in the North.

The Alliance is aiming to build on the Green Jobs Taskforce Report to highlight existing and future skills gaps in the region, and establish an integrated net zero skills and productivity programme.

This aims to be delivered in-part through the creation of Skills Hubs to deliver level 8 training to the next generation of business leaders.

N8 have proposed this activity as part of a £168m investment.

1.3 Skills: Specification of interventions

Intervention 3: Develop career support offer to enable transfer from existing to new sectors

What does this intervention involve?

- Sharing of skills and learning around project pre-development
- Coordinate around design of 'skills pilots' – e.g. projects with a requirement to upskill a target proportion of workers, or to deploy a target proportion of local workers- and then share learnings and insights around delivery
- Ensure visibility around project pipeline across regions, so that skilled workers can move in a frictionless way between projects in different areas
- Support SMEs with funding to access outsourced apprenticeship services (which is normally a paid-for service)
- Developing ways to achieving necessary skill levels either within employment or towards it, including both experiential and academic requirements and achieving DfE recognition for these
- Development of vision for how careers will need to be developed to support transfer from existing to new sectors including how training can be delivered whilst in employment.

What the North is already doing

- Vocational training centre at Port of Blyth
- Drax & Selby College

Estimated resources

- 1 FTE dedicated to analyse and develop career support opportunities

Required timeframes

NEAR TO MEDIUM TERM (1-3 YEARS)

- Work on this intervention can start as soon as possible, with potential achievements reached in the short term

1.3 Skills: Specification of interventions

Skills Interventions (General)

Why this intervention is needed /what will happen without it?

Benefits of collaboration



- Higher wages and encouragement to invest in productivity improvements via training and technology investments
- Employment in key sectors directly supported by skills provision, reducing likely loss of jobs to other sectors
- Improvements in sector diversity
- Higher level of skill and productivity to attract inward investment
- Stronger business growth due to a more comprehensive skills offer
- More efficient skills provision, better coordinated investment in a comprehensive skills offer which is industry-led
- Greater scale for industry collaboration enabling delivery of bespoke courses and apprenticeships
- Opportunity for shared learning and best practice/exemplars across the North

Counterfactual



- Slowed/reduced employment in key sectors, or loss of employment to other regions
- Slowed/reduced improvements in sector diversity
- Offshoring and outsourcing to other regions, and loss of potential inward investment
- Slower business growth due to skills gaps
- Inefficient skills provision - excessive competition in segments of the skills pathways resulting in reduced capacity for training and upskilling an embedded workforce
- Inefficient skills provision - provision is not industry-led and lags behind changing industry needs, with individuals often requiring further training
- Increased labour prices, delays to projects due to skills shortages

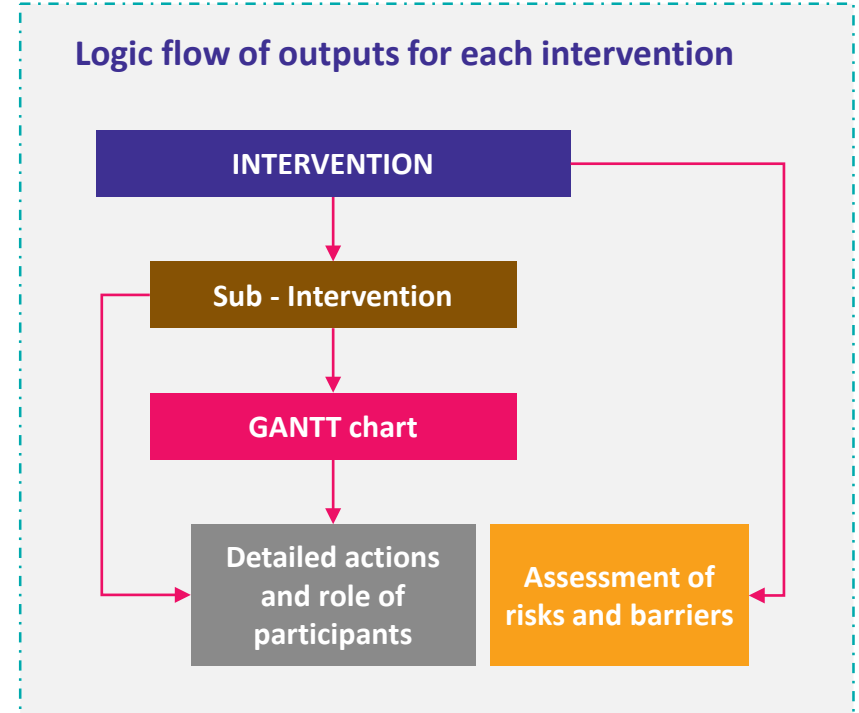
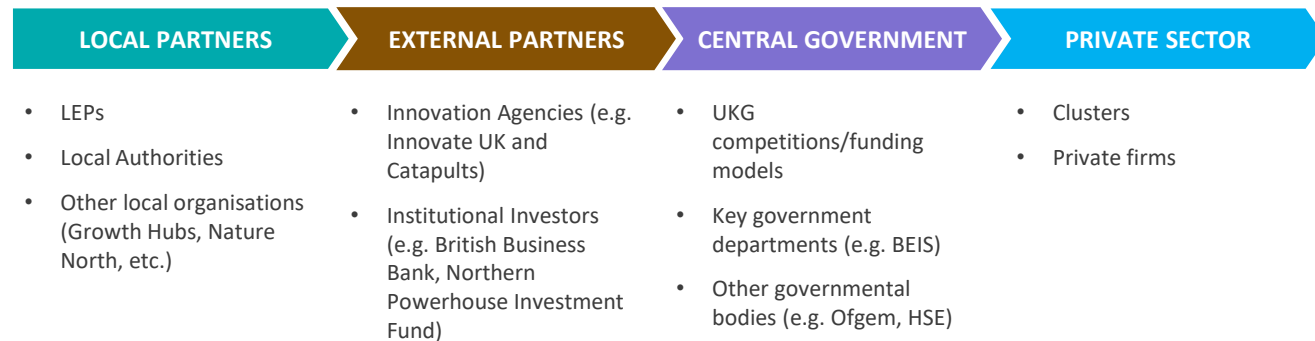
02

Detailed Delivery Plans

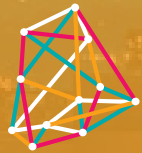


2.1 Detailed Delivery Plans: Overview

- This section sets out a detailed delivery plan for each of the interventions identified in the economic analysis (section 1).
- Following the structure of the economic analysis, these interventions have been categorised into ‘supply-side’, ‘demand-side’ and ‘skills’. Some of the activities are inevitably cross-cutting, and the categories are not intended as perfect sub-divisions, but remain useful for ensuring delivery of action plans.
- For each intervention, we have identified (with stakeholder input) a series of sub-interventions, and included a detailed delivery timeline, actions and activities, to give an indication of the programmes of work required. We have also assessed risks and barriers to the delivery of each intervention.
- For all actions and activities in the delivery timeline we assigned a stakeholder group who will be the main driver and will be responsible for the delivery of the action. The key for this color coding can be seen below:



NP11



2.1 | Supply side

- Risks & Barriers
- Project Schedule

2.2 | Demand side

2.3 | Skills

Detailed Delivery Plans



2.1 Supply side: Overview of interventions

The supply-side interventions outlined can boost the output and competitiveness of Northern industry, by giving businesses opportunities to reduce costs, improve productivity, and attract more funding and investment, from both the public and private sectors.



These interventions are summarised in the table below:

	Intervention	Activities
Supply side	1. Encouraging alignment, collaboration and information-sharing	Development of shared business cases
		Organising regional forums to share information
		Increasing cluster alignment
	2. Supply chain mapping, gap analysis, and opportunities identification	Supply chain mapping and gap analysis
		Identify supply chain opportunities
	3. Exploit supply-side synergies	Encouraging co-location of hydrogen production with renewables and nuclear
		Shared Hydrogen Transport and Storage Infrastructure, and other low-carbon heat solutions
	4. Supporting increased funding and support for new technologies	Creating a shared 'Northern Voice' to represent common interests and innovation funding priorities
Supporting new technologies such as tidal and floating wind, with a focus on integration with hydrogen		

2.1 Supply side: Risks and Barriers

This section identifies the key risks and barriers identified by stakeholders in the delivery of our interventions, and suggested activities to address these.

Supply side risks and barriers (1/2)

Risk/barrier 	How to address 	Parties' roles in addressing		
		Local Partners	Private Sector & External Partners	Central Government
<p>Competition with other UK regions and clusters for BEIS competitions & private investment in low-carbon technologies (e.g. East Coast Cluster).</p>	<ul style="list-style-type: none"> Improving intelligence-gathering around competition Improving quality of bids/regional business cases Increasing inter-cluster working and alignment 	<p>Create collaborative forums to enable information-sharing and promote collaboration (e.g. shared business cases) both within, and between clusters.</p>	<p>Participation in collaboration initiatives, and willingness to adapt and share expertise (incl. between clusters).</p>	<p>Ensure funding pots are sufficient to not block viable projects with societal benefits</p>
<p>Areas without access to industrial clusters excluded from opportunities.</p>	<ul style="list-style-type: none"> Identification of supply chain opportunities and gaps, to improve local procurement and generate regional demand across the entire value chain Potential to extend the geographic reach of low-carbon networks (e.g. CCUS infrastructure) 	<p>Supply chain analysis, and implementation of findings (e.g. regional procurement principles).</p>		<p>Assess viability of long-run availability of CCUS/hydrogen networks beyond initial clusters</p>
<p>Lack of UK Government clarity on regulatory frameworks and grant funding (e.g. for new tech demonstrations, and Hydrogen T&S) limiting private sector confidence and investment.</p>	<ul style="list-style-type: none"> Improving effectiveness of lobbying of central government on share priorities through establishment of 'Northern Voice' 	<p>Coordinate asks for UKG through regional forums (e.g. 'Northern Voice').</p>	<p>Feed into regional forums</p>	<p>Provide clarity around funding criteria for competitions, and business models for low-carbon deployment.</p>

Immediate, significant blocker

Potentially significant impact in mid/longer term

Could affect longer term development

2.1 Supply side: Risks and Barriers

Supply side risks and barriers (2/2)

Risk/barrier 	How to address 	Parties' roles in addressing		
		Local Partners	Private Sector & External Partners	Central Government
<p>Skills gap limiting capacity to grow low-carbon industries/meet demand for infrastructure build</p>	<ul style="list-style-type: none"> Assessment of skills needs to meet current and future industry requirements Coordinated action on skills development (e.g. Centres of Excellence), and improve availability of in-career upskilling/retraining options 	<p>Coordination of regional skills programme (see skills interventions)</p>	<p>Provide clear outline of skills requirements and current gaps, and invest in training and apprenticeship programmes</p>	<p>Improve UK-wide funding/provision for career development & retraining</p>
<p>Long build-times for larger projects (e.g. new Nuclear) limiting investor confidence</p>	<ul style="list-style-type: none"> Ensuring nuclear and hydrogen producers have the opportunities and information required to assess viability, and improve confidence in the potential for co-location partnerships 	<p>Provide forums/spaces and institutional knowledge to promote collaboration and partnerships, and develop best-practice guidance</p>	<p>Increased collaboration and investment in co-location to demonstrate viability and profitability</p>	<p>Clarity on business models for co-location, and deployment of new nuclear</p>

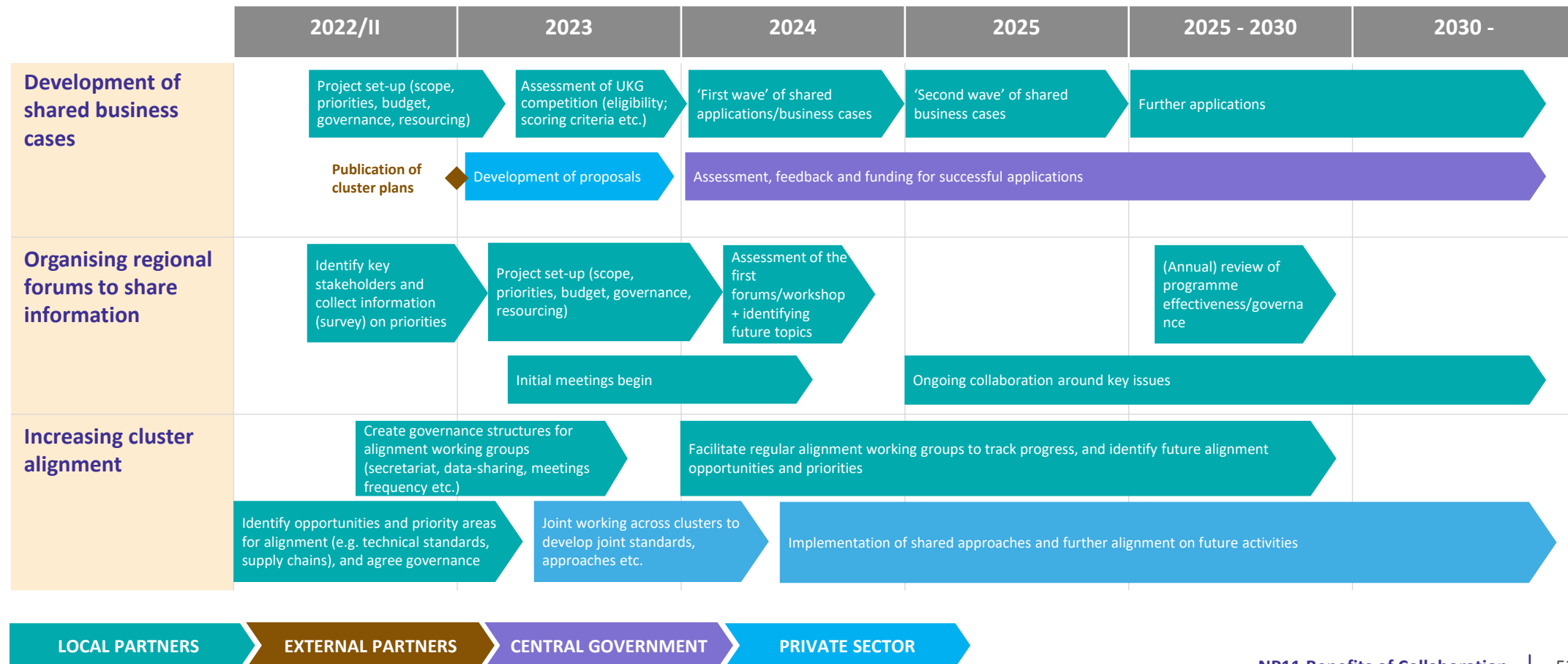
Immediate, significant blocker

Potentially significant impact in mid/longer term

Could affect longer term development

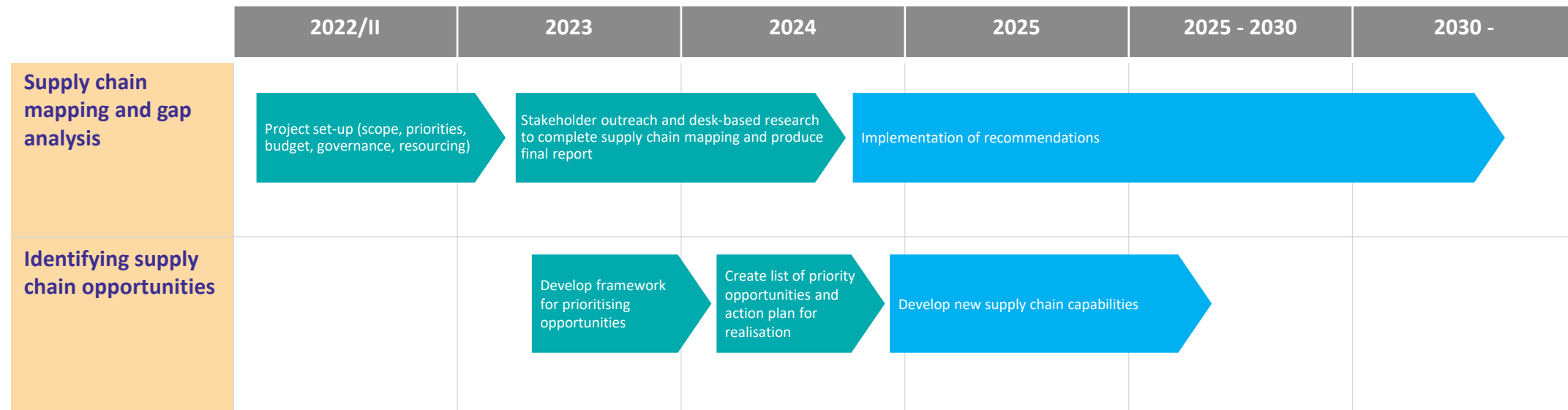
2.1 Supply side: Intervention 1 Project Schedule

Intervention 1: Encouraging alignment, collaboration and information-sharing



2.1 Supply side: Intervention 2 Project Schedule

Intervention 2: Supply chain mapping, gap analysis, and opportunities identification



LOCAL PARTNERS

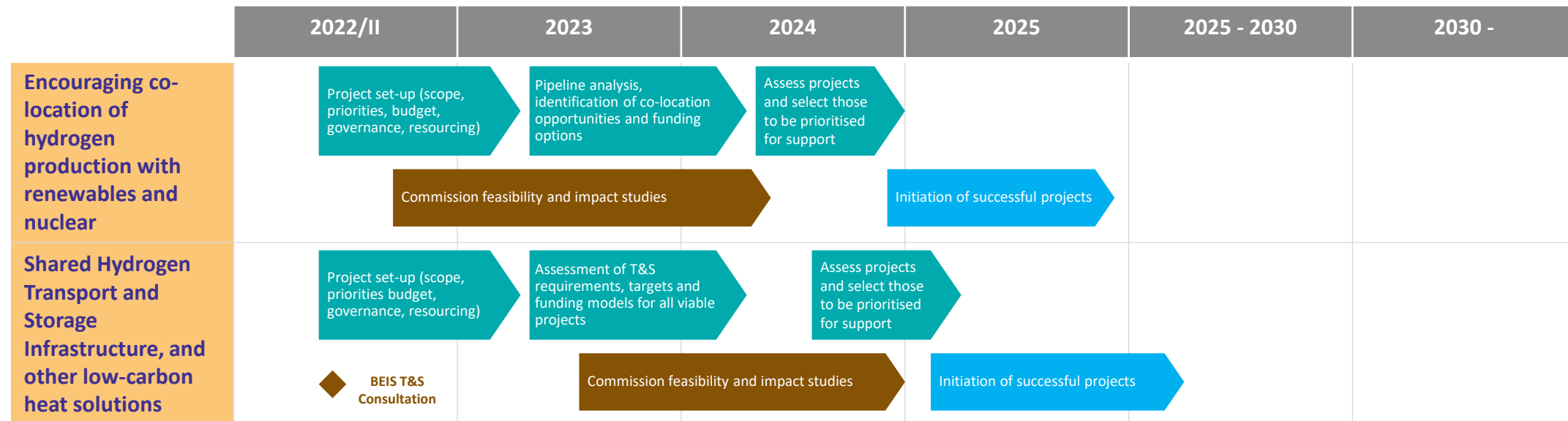
EXTERNAL PARTNERS

CENTRAL GOVERNMENT

PRIVATE SECTOR

2.1 Supply side: Intervention 3 Project Schedule

Intervention 3: Exploit supply-side synergies



LOCAL PARTNERS

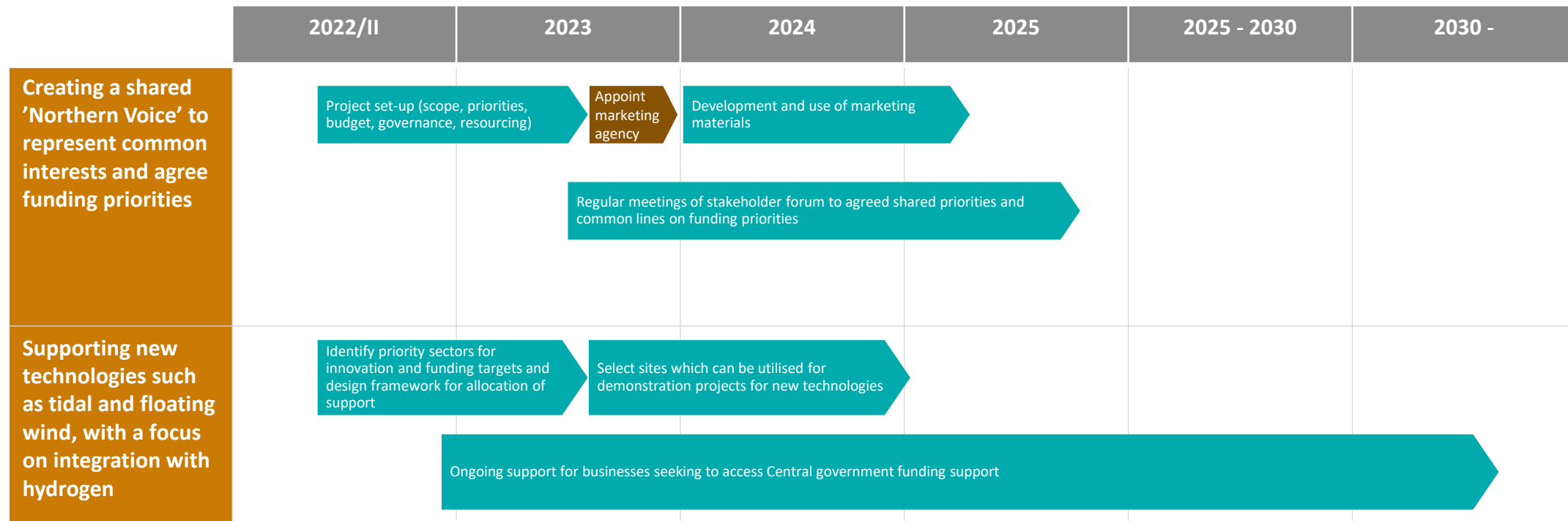
EXTERNAL PARTNERS

CENTRAL GOVERNMENT

PRIVATE SECTOR

2.1 Supply side: Intervention 4 Project Schedule

Intervention 4: Supporting increased funding and support for new technologies



LOCAL PARTNERS

EXTERNAL PARTNERS

CENTRAL GOVERNMENT

PRIVATE SECTOR

NP11



2.1 | Supply side

2.2 | Demand side

- Risks & Barriers
- Project Schedule

2.3 | Skills

Detailed Delivery Plans



2.2 Demand side: Overview of Interventions

The demand-side interventions outlined can boost demand for Northern Industry for by increasing uptake of low-carbon solutions in both the private and public sectors, and supporting the growth of markets and investment in commercial waste and circular economy initiatives.

These interventions are summarised in the table below:

	Intervention	Activities
Demand side	1. Collaboration around nature-based solutions	Develop a strategic plan for nature
		Develop a common benefits valuation framework
	2. Supporting the development of a circular economy	Optimising waste resource flow; greater reuse of waste streams across borders
		Create a list of market mechanisms
	3. Providing shared project development/business case capacity for local energy projects and decarbonised heat/transport	Building capacity into business case development
	4. Local area energy master planning	Northern Energy master planning
		Feeding into networks' work on developing smart grids and flexibility

2.2 Demand side: Risks and Barriers

This section identifies the key risks and barriers identified by stakeholders in the delivery of our interventions, and suggested activities to address these.

Demand side risks and barriers (1/2)

Risk/barrier	How to address	Parties' roles in addressing		
		Local Partners	Private Sector & External Partners	Central Government
<p>Uncertainty due to delays in DEFRA releasing final waste strategy may limit investment in waste solutions</p>	<ul style="list-style-type: none"> Identify commercial waste/circular opportunities economies in the region through assessment of current waste streams and market mechanisms Action 'quick wins' and develop joint set of asks/priorities for central government 	<p>Commission studies to generate action plans, and facilitate information sharing and collaboration between private and public sector bodies</p>	<p>Implementation of commercial waste and circular economy solutions</p>	<p>Publication of waste strategy and further clarity on funding mechanisms</p>
<p>Uncertainty around the future of hydrogen in heating, including blending</p>	<ul style="list-style-type: none"> Develop scenarios-based approaches to local energy master-planning, incl. high/low ranges for electricity and hydrogen demand 	<p>Work with networks to ensure capacity and information availability to deliver assessments</p>	<p>(Networks) Delivery of network maps, and action and investment plans to meet demand</p>	<p>Timely decisions on the role of hydrogen in heating (2026), and blending into the grid (2023)</p>
<p>Absence of proper valuation of carbon-reduction (i.e. carbon pricing + ESG requirements) limiting investment in low-carbon projects, incl. nature-based solutions</p>	<ul style="list-style-type: none"> Develop a common approach to valuation for use in business cases, and build capacity into business case development to facilitate a unified approach across the region 	<p>Develop best-practice guidance and work with local industry to build this into business case development</p>	<p>Adopt common approaches and increase business case development capacity</p>	<p>Delivery of new ETS, and other funding schemes (e.g. for NBS & demand-reduction initiatives)</p>

Immediate, significant blocker

Potentially significant impact in mid/longer term

Could affect longer term development

2.2 Demand side: Risks and Barriers

Demand side risks and barriers (2/2)

Risk/barrier	How to address	Parties' roles in addressing		
		Local Partners	Private Sector & External Partners	Central Government
<p>Volatility of energy prices reduces investment confidence due to uncertainty around future supply chain and energy costs, and value of alternative fuels/demand-reduction</p>	<ul style="list-style-type: none"> Ensure business cases are resilient to a range of supply/demand scenarios Encourage onshoring/local procurement of energy and supply chain materials wherever possible 	<p>Develop best-practice guidance for forecasting /valuation, and provide opportunities for local supply chain collaboration</p>	<p>Adopt common approaches/methodologies in development of businesses cases, and embrace local supply chain opportunities</p>	
<p>Grant programmes are time limited and resource intensive, taking resources from longer term commercial proposals</p>	<ul style="list-style-type: none"> Build capacity into business case development within industry, and provide support for industry and guidance on best-practice in applying for government grants 	<p>Provide support and guidance for success in UKG funding applications</p>	<p>Increase capacity for business case development</p>	
<p>Land availability for nature based solutions</p>	<ul style="list-style-type: none"> Collaboratively develop a strategic plan for nature, including evidence base and consultation, which considers trade off and optimum use of land for different uses including nature 	<p>Work with landowners to implement, plan and build confidence in the nature based solution sector Create examples of high integrity at scale</p>	<p>Investment in examples for nature based solutions sector, and support capacity building in the sector</p>	<p>Clarification in implementation of ELMS (Environmental Land Management Schemes) and other related policies</p>

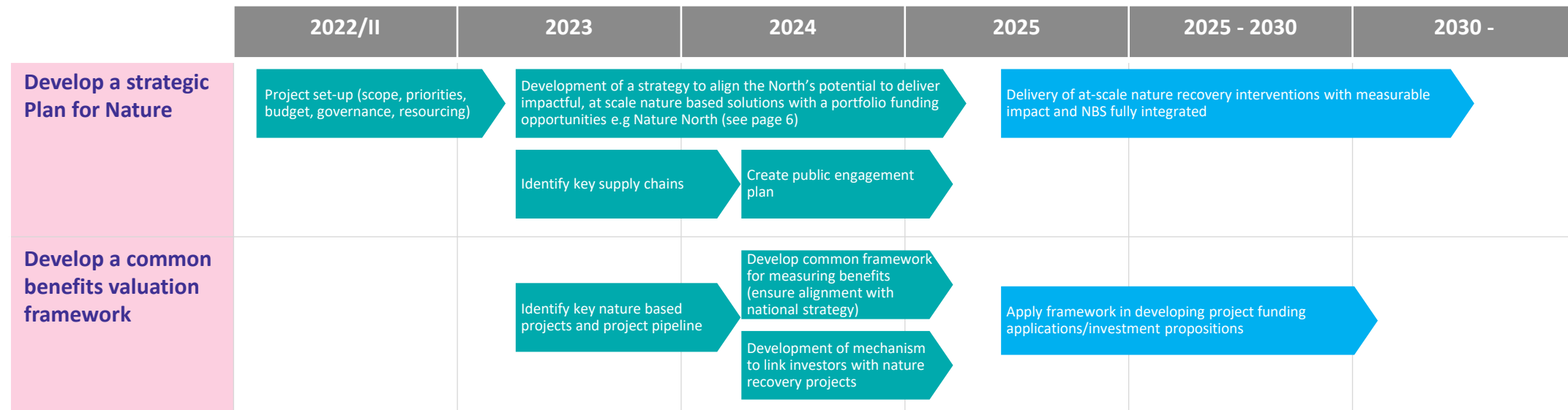
Immediate, significant blocker

Potentially significant impact in mid/longer term

Could affect longer term development

2.2 Demand side: Intervention 1 Project Schedule

Intervention 1 – Collaboration around nature-based solutions



LOCAL PARTNERS

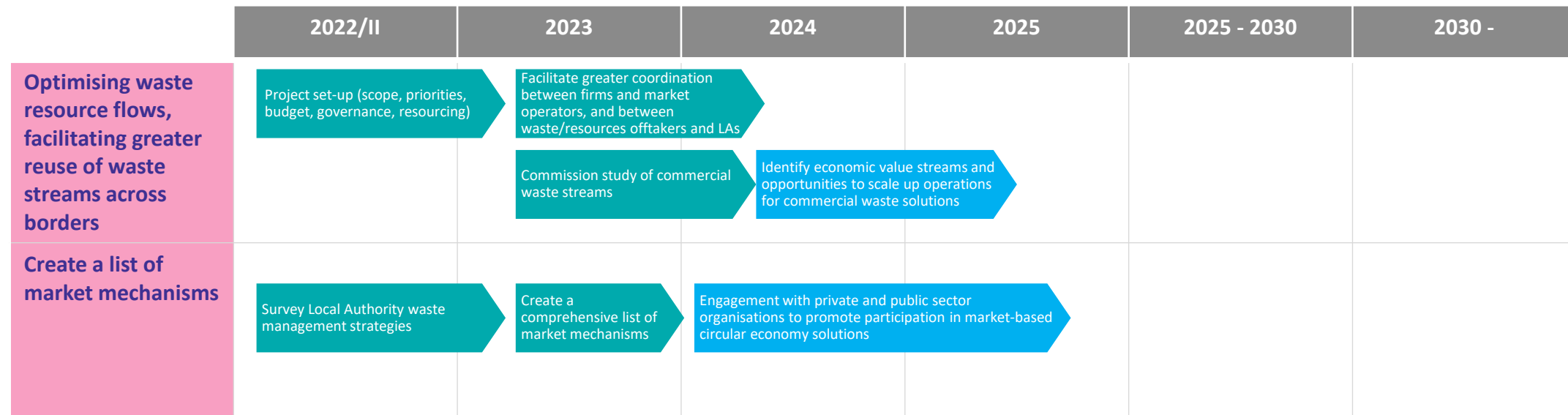
EXTERNAL PARTNERS

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PRIVATE SECTOR

2.2 Demand side: Intervention 2 Project Schedule

Intervention 2 – Supporting the development of a circular economy and market mechanisms



LOCAL PARTNERS

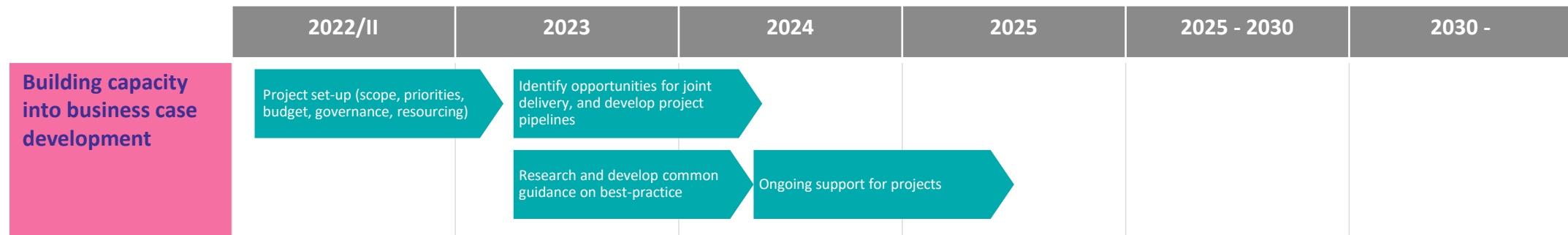
EXTERNAL PARTNERS

CENTRAL GOVERNMENT

PRIVATE SECTOR

2.2 Demand side: Intervention 3 Project Schedule

Intervention 3 – Providing shared project development/business case capacity for local energy projects and decarbonised heat/transport



LOCAL PARTNERS

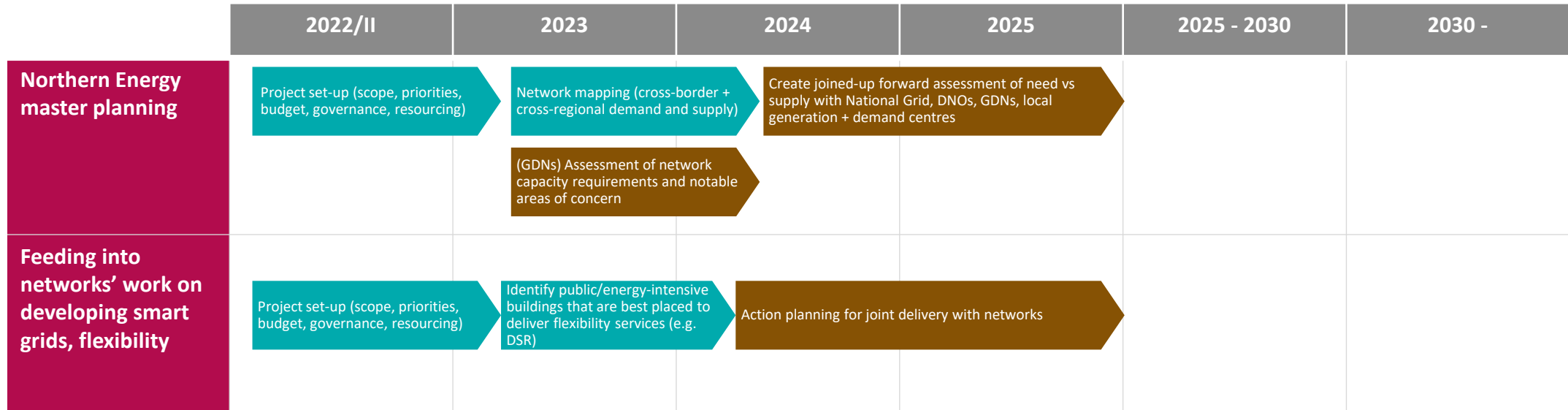
EXTERNAL PARTNERS

CENTRAL GOVERNMENT

PRIVATE SECTOR

2.2 Demand side: Intervention 4 Project Schedule

Intervention 4 – Local area energy master planning



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3.1 | Supply side

3.2 | Demand side

3.3 | Skills

- Risks & Barriers
- Project Schedule

Detailed Delivery Plans

2.3 Skills: Overview of Interventions

The skills interventions outlined will provide the platform for employers and educational institutions to modernise and expand their training offering, and improve career pathways. This will ensure that the Northern workforce is equipped for the challenges of the future, and all workers have the opportunity to benefit from the net-zero transition.



These interventions are outlined in the table below:

Intervention	
Skills	1. Collaboration around future skills needs Analysis of shared skills requirements and gaps across the North
	2. Regional centres of excellence Establishment of regional hubs for development and provision of skills training
	3. Enabling transfer from existing to new sectors Develop offer to support people looking to move into the industries of the future

2.3 Skills: Risks and Barriers

This section identifies the key risks and barriers identified by stakeholders in the delivery of our interventions, and suggested activities to address these.

Skills risks and barriers

Risk/barrier 	How to address 	Parties' roles in addressing		
		Local Partners	Private Sector & External Partners	Central Government
<p>Lack of clear picture of industry skills requirements and current gaps</p>	<ul style="list-style-type: none"> • Identification and agreement of clear, region-wide skills requirements across industries, and key priorities for future action 	<p>Deliver assessment of regional skills requirements/gaps, now and in the future</p>	<p>Provide information to LEPs on skills requirements</p>	<p>Develop national skills agenda that can provide template for regional-level assessments of requirements</p>
<p>Limited opportunities for newly qualified candidates in the labour market</p>	<ul style="list-style-type: none"> • Ensure buy-in (e.g. recognition of qualifications) from key regional employers/trade bodies • Work with other regions/national institutions to ensure consistency of approaches 	<p>Facilitate partnerships between skills/educational institutions and industry, and promote apprenticeships</p> <p>Provide pathways for newly qualified candidates into industry</p>	<p>Work collaboratively (education and industry) to develop shared skills narrative, and develop training programmes</p>	<p>Provide recognition of qualifications, and coordinate national approach to new skills requirements training</p>
<p>Funding gap for skills provision, both public provision and private sector training</p>	<ul style="list-style-type: none"> • Public-sector funding for skills development (including in-career upskilling opportunities) • Ensure private sector prioritises training offer + apprenticeships, and promote examples of best-practice (e.g. through partnerships) 	<p>Develop a clear set of requirements and gaps, and develop action plan for how to achieve these (e.g. centres of excellence) – noting where further investment is needed and by whom</p>	<p>Investment in retraining/skills offer for employees</p>	<p>Deliver funding for skills development, apprenticeships, and rewards for employers to invest in training</p>

Immediate, significant blocker

Potentially significant impact in mid/longer term

Could affect longer term development

2.3 Skills: Interventions 1-3 Project Schedule

Interventions – Skills

	2022/II	2023	2024	2025	2025 - 2030	2030 -
Collaboration around future skills needs at a regional level	Project set-up (scope, priorities, budget, governance, resourcing)	Identify sector needs and current training offering to identify skills gaps Develop action plan for fulfilling future skills needs	Engagement with local education providers and employers to fill gaps			
Regional centres of excellence	Identify current areas of provision and notable capacity constraints	Identify potential locations, existing projects, funding opportunities, and risks Develop collaborative delivery models and begin process for accelerated delivery				
Enabling transfer from new to existing sectors	Project set-up (scope, priorities, budget, governance, resourcing)	Research existing retraining options, transfer pathways, global best-practice, and sector needs	Engagement with local employers and education providers to develop retraining support, and funding options			





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