



# Innovation Strategy

June 2024

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# 1. Introduction

## Purpose

Through this Strategy the [Humber Freeport Innovation Liaison Group](#) (FILG) on behalf of the Humber Freeport will drive forward its innovation workplan, creating a platform for collaboration right across the Humber estuary.

The FILG's mission is to enhance business productivity within the Humber through developing an innovative eco-system. We aim to do this through targeting our key sectors of energy, advanced manufacturing, and ports & logistics.

By horizon scanning evolving and new markets for innovation expertise and activity, and keeping an oversight of emerging technologies, we hope to develop an evidence base and priorities for future investment. The strategy should be considered a forward-looking document of the Humber Freeport which will be updated on an ongoing basis.

The strategy aims to:

- Provide a context that shapes and impacts how local innovations are being facilitated and the challenges they encounter.
- Outline how it will enable implementation of ideas and opportunities.

## Our Vision

For the Humber economy to be one of the most innovative and productive within North-West Europe.

## Our Objectives

To contribute to the Humber Freeports success through developing a pan Humber Innovation eco-system that results in:

- An increased innovative and productive business base in key sectors within the Humber economy
- An evolving and sustainable model for pan Humber innovation

## Operating Principles

- Triple Helix: Public-Private-Education partnership
- Polycentric
- Malleable boundaries
- Model that takes a Leader, Investor, Partner approach
- Collaboration and Competition
- Impactful and inclusive

## The Humber Estuary and Innovation Opportunities

The Humber Estuary boasts a thriving port complex running from Goole at the western end, to Grimsby at the eastern end, with Hull, Immingham, Killingholme and New Holland ports that handles over 40,000 shipping movements each year and 79 million tonnes of cargo. The Humber operates as a network of ports and terminals and has good inland rail, road and inland waterway links, proximity to several regional airports and is connected to key infrastructure such as distribution pipelines. Road and rail freight connectivity on both banks of the Humber and into Goole enables the synergy within the estuary.

Humber is the busiest port complex by tonnage in the UK and the Humber Energy Estuary accounts for roughly half of England's natural gas and hosts two of the UK's six oil refineries and its second largest chemicals cluster. A quarter of all economic activity in the Freeport depends directly on carbon-intensive industries which encourages progress towards net zero by developing green innovative technologies. The Humber Freeport is uniquely placed to facilitate innovations in logistics and net zero clusters.



*Port of Immingham (Source: Greater Lincolnshire LEP)*

The tax sites and seed capital sites at the Freeport will support innovations by facilitating business parks, business incubators, manufacturing, research and logistics facilities. The region has made use of government support in the form of Enterprise Zones and other programmes, there is potential and need to do significantly more in terms of innovation facilitation, leveraging the Humber's sectoral strengths in clean energy and logistics.

The Freeport will look at innovation opportunities right across the Humber Estuary, focusing on its key clusters. Future Innovation projects and programmes will over time be proposed through the existing innovation ecosystem within the Freeport boundary and its wider economic hinterlands. This allows for leverage of skills, knowledge, inter-sectoral collaboration and synergy in facilitating innovations that not only benefit the Freeport businesses, but also contribute to health innovations, increased numbers of highly skilled jobs and improved infrastructure for the wider community in the region.

## **2. Strategic Context**

### **UK Policy**

The vision for the UK is to be a global hub for innovation and the current UK Innovation Strategy [UK Innovation Strategy: leading the future by creating it \(accessible webpage\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/uk-innovation-strategy-leading-the-future-by-creating-it) set out plans in 2023 against 4 key pillars to support the achievement of that vision:

- Pillar 1: Unleashing business to fuel businesses who want to innovate.
- Pillar 2: People - making the UK the most exciting place for innovation talent.
- Pillar 3: Institutions and places - ensuring research, development and innovation institutions serve the needs of businesses and places across the UK.
- Pillar 4: Missions and technologies – stimulating innovation to tackle major challenges faced by the UK and the world and drive capability in key technologies.

By providing local solutions to national challenges the Humber Freeport can impact on these pillars in several ways as highlighted in **Appendix A**.

## Added Value

We intend to use a number of clear measures to demonstrate the value added by Humber Freeport when it comes to strategic innovation support including:

- Increased innovation-based investment accessed in the Humber
- Increased knowledge transfer
- Key sectoral initiatives
- Access to / development of key talent
- Innovation and prototyping take up
- Patent registrations
- Strategic innovation led projects identified for future support
- Number of businesses benefitting from HFIC annually
- Key cluster growth and expansion
- Number of briefings to potential funders

## Tactics

The FILG has identified a mix of approaches to continue to expand its innovation eco-system:

- Collaborative Networks & Events
- Centres of Excellence
- Enhanced funding streams
- Talent development
- Knowledge transfer and prototyping
- Innovative research
- Cross fertilisation of key strands
- Cluster led workshops
- Regulatory & digital opportunities
- Dissemination of opportunities/achievements
- International learning

## Local Governance and Opportunities

### *Devolution*

The government has set itself a mission that, by 2030, every part of England that wants a devolution deal will have one with a simplified, long-term funding settlement. The Levelling Up White Paper 2022 and Levelling Up and Regeneration Act 2023 make the case for devolution citing the need for improved productivity and reduced regional disparities.

In Greater Lincolnshire the Level 3 devolution deal between the government and the local authorities of Lincolnshire County Council, North East Lincolnshire Council, and North Lincolnshire Council will result in a Mayoral Combined County Authority (MCCA). Greater Lincolnshire has a unique place in the future success of the UK with focus on clean energy, carbon capture opportunities, and food security. It has a vital role in global trade, securing the nation's supply chains in key industries.

In Hull and East Yorkshire the Level 3 devolution deal between the Government and the local authorities of Kingston upon Hull City Council and East Riding of Yorkshire Council will result in another MCCA. The deal offers the opportunity to leverage Hull and East Yorkshire's sectoral strengths in the transition to a

more productive, low carbon economy whilst improving the living standards and economic opportunities for their most deprived communities.

A central condition for both anticipated MCCAs due to be established in May 2025 is the creation of a Mayoral Joint Committee (MJC) to oversee strategic pan-Humber issues that affect both areas. This Committee will consist of two Mayors and four Leaders with associated membership from the Police and Crime Commissioner, both the Universities of Hull and Lincoln, the Integrated Care Board along with both the Chairs of the Humber Freeport and the Humber Energy Board. The emerging MJC, through Hull City Council, has commissioned a pan Humber Economic Strategy.

How the Humber Freeport through its existing innovation eco system interacts and collaborates with the MJC and its emerging priorities will be extremely important, creating synergies, combined opportunities for investment and commissioning joint pilot/test bed research activity.

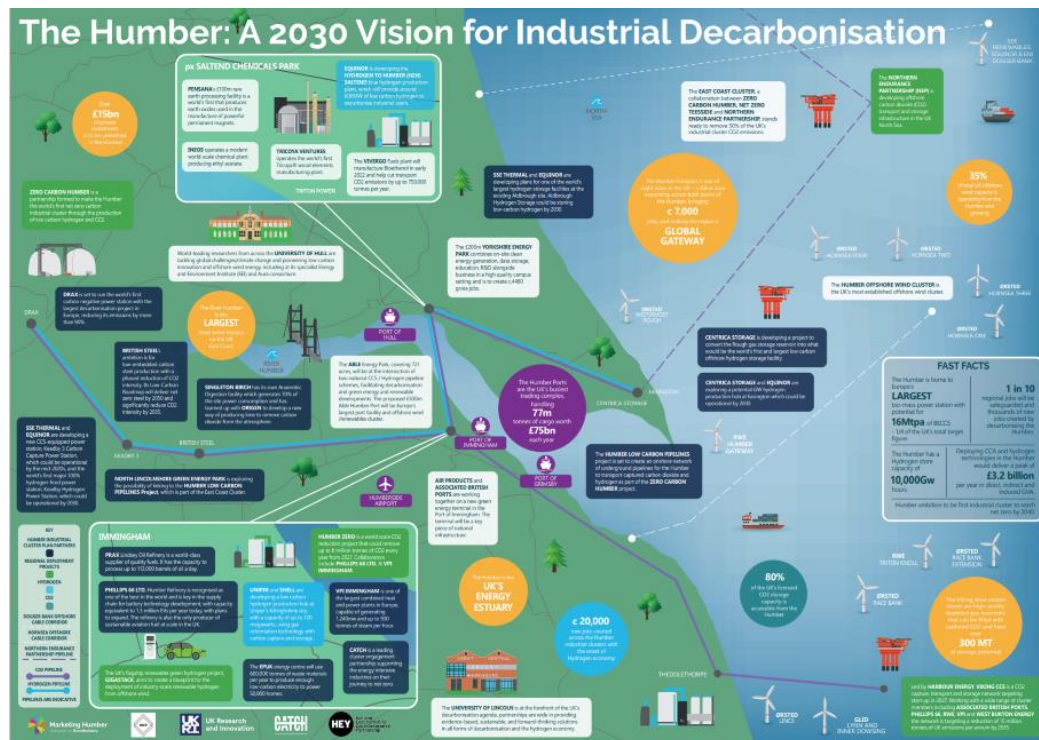
### Humber Industrial Cluster Plan

The Humber Industrial Cluster plan was set up in January 2021 following the 2-phase decarbonisation of industrial clusters roadmaps competition in 2019 by UKRI.

The HICP vision encompasses how industrial emissions will change over time and provide projects and industry with a well-defined and optimal route to achieving true net zero in 2040, by validating technological pathways, data, literature, interviews, research, supply chains, skills development and defining areas for investment.

The Humber region emits more 50% more CO2 than any other UK industrial cluster thus providing the largest opportunity for innovation and change to enable a low carbon future.

The map below brings together the breath of infrastructure, carbon sequestration capacity, hydrogen storage and production in the Humber, but also highlights the vast potential for skills, job creation and investment. Many of the companies involved in the HICP are looking at how to evolve and innovate – assessing which technologies need to be improved and which technologies will need to be introduced if we are to achieve true net zero by 2040.





### 3. Funding Approach

The FILG will actively seek funding where appropriate to do so, leveraging catalytic support to help access wider investment nationally and internationally.

The Freeport has formulated its initial approach to innovation led seed capital such as investment in Ideal Boilers, helping to fund their laboratories and air sourced heating product development. The Heat Pumps Laboratory facilities and new testing capabilities are to ensure that the future of Ideal Heating's product portfolio has area for growth in the most efficient way, delivering a robust solution for developing low carbon UK specific products of the future, while supporting new and growing markets. This new facility expansion is required to meet a wider product range, an increase in product roadmap for products specific to the UK commercial and domestic markets. It could include several test rigs, heat/cool water systems, environment testing chamber and climatic chambers allowing R&D projects, quality and reliability programmes, witness testing and preparation for certification. In addition, Ideal are developing Hydrogen Laboratory facilities to support domestic development of Hydrogen appliances, alongside reliability and quality requirements.

### Tax Sites

Tax Site interventions will support innovation projects, helping to address viability challenges and support enabling infrastructure. The local retention of pooled incremental business rates generated by the three Tax Sites is expected to be one of the most valuable elements of the Freeports package in terms of delivering the Innovation strategy's medium and long-term objectives.



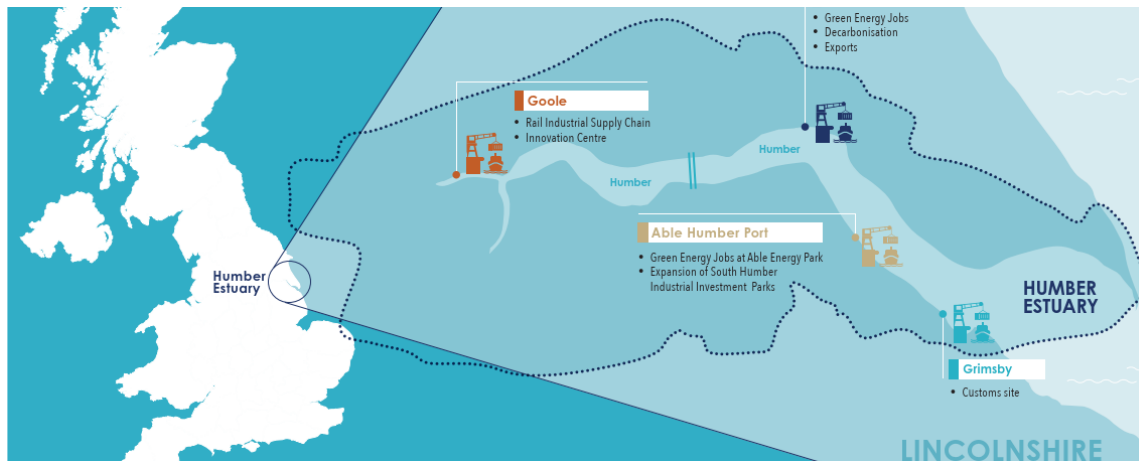
Proposed Able Marine Energy Park



Saltend Chemicals Park, Hull



Raise Innovation Centre adjacent to tax site at Goole



The retained business rates uplift guaranteed for 25 years will over time facilitate investment in innovation that will deliver further sustainable green growth across the Freeport boundary area and beyond and deliver meaningful and sustained levelling-up. However, in the short-term funding gaps may exist as it will take time for the local retention of incremental business rates to ramp up while the Tax Sites are being developed, and therefore retained business rates uplift currently cannot be defined.

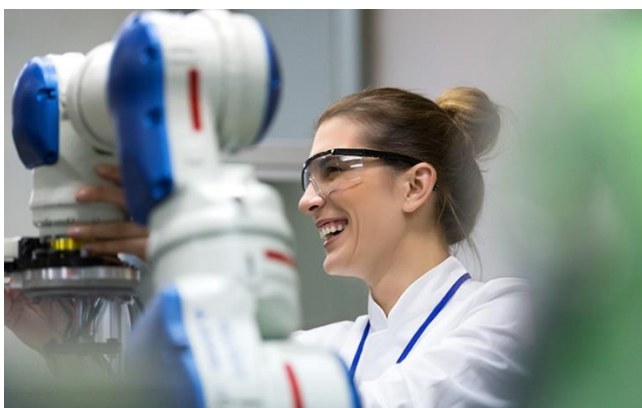
Relevant innovation linked projects, when confirmed by the Freeport Company and approved by the Public Funds Committee, will be able to access the following funding sources:

- **Tax Sites and Seed Capital funding.** Tax benefits and future retained business rates to support innovation projects helping to address viability challenges and support enabling infrastructure.
- **Wider government funding** (such as, UKRI, Research England RED Fund, Innovate UK)
- **Private sector financing**

Investments in innovation led programmes will be identified by the Freeport Company via (a) a call for proposals and (b) the generation by the Freeport Company of its own potential schemes. These will be subject to evaluation based on clear criteria and a prioritisation process as set out in the Freeport Company's Investment Policy.

#### **4. Humber Freeport Innovation Hubs**

**The Humber Freeport Innovation Group will propel innovation catalysed by the Freeport activities, increasing investments in R&D in the region and generating economic growth in the Humber.**



The [Humber Freeport Innovation Collective](#) (HFIC) is jointly supported by the University of Hull and the University of Lincoln, bringing together significant existing innovation assets and relationships with key businesses and innovation stakeholders across the region. A Memorandum of Understanding is in place between the two universities on research and innovation collaboration in relation to the Freeport and the



3 priority clusters, maximising the benefit of their complementary specialisms and expertise.

The HFIC serves and supports businesses as a one-stop shop to access funding support, to advise businesses on capital investment, staffing and skills development, to help develop business-academic collaborations and support the networking of businesses in the core cluster areas. Our existing innovation hubs seek to build on this and further the momentum and engagement between academic institutions and Freeport businesses to develop a network of industry-academic relationships based on applied university research and commercial returns to Freeport businesses. The HFIC will help to coordinate innovation led activity, with specific projects and development plans organised through the existing ecosystem within the Freeport and its wider economic hinterlands.



The Freeport utilises a number of regional hubs in the aim of creating a resilient, inclusive, innovation-driven regional economy taking full advantage of the investments in the Freeport and building on previous regional investments. The region has several established and operational centres of excellence in Research, Development & Innovation. These centres form the basis of the HFIC, aligning the development of strategic sectors with their technical skills, knowledge, and expertise. Existing hubs include the [Aura Innovation Centre](#), [The Bridge Advanced Materials and Engineering R&D Centre](#), [Offshore Renewable Energy Catapult](#), [Lincoln Institute for Agri-Food Technology](#) (LIAT) and the [National Centre for Food Manufacturing](#) (NCFM).

The Humber's innovation ecosystem and our universities' research capabilities are aligned to our ambition and complement each other, and private sector led innovation at our Tax Sites and Seed Capital Sites. In addition to delivery through the regional hubs, the Universities of Hull and Lincoln support innovation delivery through Knowledge Transfer Partnerships.

## Innovation Development and Facilitation Through Agglomeration Effects

A central focus for the FILG will be the creation of agglomeration effects around: energy, ports and logistics and advanced manufacturing. These sectors are pivotal to the economic success of the sub-region and are established strategic priorities.

Over time agglomeration effects will deliver:

- Lower transport costs and shorter supply chains for the businesses located directly at the tax sites and within the outer boundary of the Freeport.
- Better functioning local markets bringing together a dense cluster of enterprises focused on these sectors building the intensity of activity amongst the businesses they comprise.
- Greater incentives to develop a specialised workforce in these sectors, building the capacity of the tax sites as international centres of excellence.
- Accumulation of the Freeport's commercial knowledge and leverage in spill over effects from the larger scale sectoral initiatives and their wider supply chains, that collectively enables the development of new enterprises.

- The ability in relation to the relevant economic clusters to create test beds to rapidly test and iterate new ideas.
- Inter-sectoral collaboration to create synergy in innovations, e.g. clean energy and logistics or advanced manufacturing and agri-tech. This way the Freeport is adding value beyond what would otherwise happen within siloed industries.

The breadth and depth of the Humber Freeport’s key clusters, with their economies of scale, scope, feedstock and off taking of customers on the doorstep help achieve unrivalled cluster effects.

The enhanced productivity arising from these effects will support the longer-term sustainability of the Freeport and its added value and legacy through the economic interactions generated.



*Aura Innovation Centre. Photo credit: David Lee Photography Ltd.*

## Engagement with Innovation Stakeholders

A significant part of this agenda will involve an ongoing dialogue with the local authorities and Mayoral Combined County Authorities which have an important role to play in terms of local enabling and funding activities. The FILG will engage with Freeport Company’s Public Funds Committee to help advise and direct the use of the retained business rates in relation to the innovation agenda.

Liaison with the Public Funds Committee will also involve a wider dialogue with the local authorities about how their overall economic development programmes can be harnessed to build innovation synergies with the Freeport. The FILG resource will ensure these opportunities are reflected in the Freeport Innovation Plan linking in with the wider strategies and plans operating across the sub-region.

There will also be opportunities to access funding from R&D funding such as Research England RED Fund, UK Research and Innovation (UKRI), Innovate UK funding and other mainstream research funds.

## The Freeport Regulatory Engagement Network (FREN)

The FREN will enable the Humber to develop a key contribution to the national realisation of Freeport benefits by becoming a living laboratory for the transition to net zero through facilitating direct, joined-up and timely engagement between the Humber Freeport Innovation Liaison Group (the FILG) and regulators. The FREN will be used to simplify and streamline regulatory approvals, minimise bureaucracy and remove uncertainty that often prevents good ideas becoming reality.

[FREN Questionnaire](#)

## Regional Innovation Barriers and Opportunities

The FILG works directly with CATCH which already has a very well-established track record of supporting practical specialist skills across the three core clusters. The Freeport is enabling CATCH’s expansion on commercial terms by using seed capital to build an extension to their existing campus. The FILG will

work with CATCH to help ensure its plans for the use of this resource are fully tuned to reflect the needs of Freeport businesses and to identify linkages with the two core universities and wider FILG members, thus ensuring that the resource to meet the skills demands linked to innovation growth are addressed. The new Institutes of Technology in Greater Lincolnshire and Yorkshire and the Humber (which already incorporate Siemens Energy and CATCH) will be key partnerships which can provide immediate capacity in this context. The agglomeration effects of the Freeport will also act as a powerful attractor in terms of branding and engagement for direct recruitment and specialist staff sourcing.

The knowledge and innovation eco-system with its specialisms in ports and logistics, advanced manufacturing and energy, filtered through the lens of the FILG work plan, referenced at the level of individual company needs and opportunities will drive the process of playing in the expertise available to the Freeport to provide the information on technology and possibility on markets to the Freeport businesses and their supply chains. Where there is scope to develop a larger scale collective impact through national alliances linked to other Freeports, these opportunities will be identified and accessed through the FILG resource working with the national Freeport Innovation Leads Forum (FILM). The Universities, ORE Catapult and other partners will also work explore support for individual activities or bids to develop innovation funding from UKRI and other appropriate/relevant sources.

Specialisms in the Humber will play an important role for the UK, for example the Offshore Renewable Energy Catapult has established the Operations and Maintenance Centre of Excellence (OMCE) in Grimsby. As the largest offshore wind O&M port in the UK, Grimsby is the ideal hub from which to build an innovation ecosystem that secures the region as the global centre of gravity for development, demonstration and test of wind power O&M technology and techniques for decades to come.

## **5. Core Innovation Sectors**

The FILG will finesse the connections and expertise of the specialist hubs within the Freeport, with the agenda identified through its liaison with individual businesses to address the market factor challenges. It will pick out the key components within the Humber innovation eco- system to identify the most desirable combination of expertise to investigate the demand for new projects and propose areas of innovation opportunity.

The core clusters of the Hub interlink with the Humber Freeport's and the region's target markets: clean energy, advanced manufacturing and ports & logistics, as detailed below.

### **Clean Energy**

#### **Humber's Decarbonisation Ambition and the UK's Energy Estuary**

In recent years the Humber has become one of the world's leading hubs for clean energy, with innovative waste to energy to plants and bio-fuel production such as the first aviation bio fuel project at scale, over 20 operational onshore wind farms, and the country's pre-eminent centres for wind turbine blade manufacture, assembly and installation.

As the UK's Energy Estuary, the Humber provides a huge decarbonisation opportunity and Humber Freeport will play an important role in the UK's journey to net zero. Innovation in cleaner, greener technologies is already abundant in the region and Humber Freeport is keen to attract investment from companies who share the ambition to play an key role in the decarbonisation of the region and the UK.

The decarbonisation sub-group is working to develop the region's capabilities and ambition in becoming a world-leader in renewable energy, decarbonisation technology, and net zero business.

By working together, the UK's industrial clusters offer a tremendous opportunity to slash industrial emissions, whilst retaining jobs and putting the economy on a firm footing as we transition to a net zero target by 2050.

The Humber industrial cluster is the largest source of CO2 emissions and currently employs 360,000 in energy intensive, traditional sectors.

# WORKING IN OFFSHORE WIND IN THE HUMBER

At the forefront of fighting climate change in the renewable energy industry

## WHAT IS OFFSHORE WIND?

Offshore wind power or offshore wind energy is the energy taken from the force of the winds out at sea, transformed into electricity and supplied into the electricity network onshore.

Offshore wind power is a renewable and infinite energy source, and the conversion of wind into power creates no harmful greenhouse gas emissions. (National Grid, 2022)

## STEP INTO A REWARDING FUTURE:

**Apprenticeships**  
Kickstart your career in offshore wind from age 16+ and begin earning whilst progressing towards a qualification.

**Cadetships**  
Begin a career offshore working in the international shipping industry learning valuable transferable skills to offshore wind.

**University Degrees**  
Continue your post-18 learning with general and specialist university courses including the University of Hull's Masters in Renewable Energy course and PhDs in Offshore Wind.

**Graduates**  
Launch your career with graduate entry positions and programmes in finance, engineering, IT and business specialist areas and more.

**Direct entry**  
Transfer your knowledge, skills and experience from leading sectors locally and regionally into the offshore wind industry.

For latest and detailed information on all entry routes please scan the QR code below.

### Did you know?

- We're powering over 4.4 million UK homes from 8 operational offshore wind farms. In the next decade this could rise to over 14 million with the addition of 7 new offshore wind farms.
- There are ~15,000 homes in Hull - so offshore wind could power Hull 30 times over!
- The combined area of our current 8 operational offshore wind farms is 120km<sup>2</sup> - equivalent to 168,000 football pitches.
- We've broken world records three times with Lynn and Inner Dowsing (2009), Hornsea 1 (2020) and Hornsea 2 (2022) as the world's largest offshore wind farms.

### Where can I work?

There are many careers to explore in offshore wind in the Humber and there's a job for every area of interest.

An offshore wind farm has a development, construction and operational phase and we need thousands of people to make this happen.

Your future job could be onshore or offshore, technical or specialist, from wind turbine technicians to offshore coordinators, blade production operators, cable installers to environmental specialists. You could be working with tools, radios, computers or the materials to make blades. Your workplace could be on a vessel, helicopter, over 40cm into the sky on a wind turbine, in offices, control rooms, airports, factories and even universities!

Did you know there are many emerging roles in biodiversity, research and new technologies as the industry grows? We're pioneering a digital revolution with a 5G testbed to demonstrate robotics and zero emission vessels in Grimsby. We're also supporting the restoration of marine habitats at Spurn Point by reintroducing oysters and planting seagrass.

### Companies involved in offshore wind

and many more too!

## THE HUMBER OFFSHORE WIND CLUSTER

94m

155m

204m

### How big is an offshore wind turbine?

SCAN TO FIND OUT MORE...

**People behind offshore wind - career case studies**

[www.facesofwindenergy.com](http://www.facesofwindenergy.com)

### JOB PROJECTIONS

By 2030 there will be over 100,000 jobs in the UK offshore wind industry and in this region.

A workforce of over **4,700** growing to over **14,750** by 2030

We also have an abundance of low carbon resources to draw on to create a low carbon hub ready for the future. The UK can exploit the assets and opportunities in the Humber to accelerate the whole economy on our net zero journey, leading decarbonisation in the Humber opens the way for other clusters and sectors to follow.

The Humber Industrial Cluster Plan shows that for industrial emissions we can achieve net zero by 2030 and with the inclusion of Bio Energy with CCS we can achieve significant Green house gas removals, essential for decarbonisation of hard to abate sectors such as transport and heat.

The original HICP published last year modelled credible scenarios for achieving net zero by 2040 for industrial emissions. A recent refresh of these core scenarios has been published, which shows we are still on track for net zero by 2040, but each year of delay sees 6-10million tonnes of missed carbon capture.

A new webpage is available on [www.HF/decarb](http://www.HF/decarb) to find out more.

## Advanced Manufacturing

### Vision

The Humber Freeport and hinterlands is home to a thriving ecosystem of advanced manufacturing companies achieving innovative and clean energy driven operations. The FILG seeks to promote this innovation to enhance the Advanced Manufacturing (AM) sector both within the Freeport zones and the wider Humber region, making it one of the most innovative and productive within North-West Europe.

### Context

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The Humber region has substantial AM activity across a wide range of sectors and the establishment of the Humber Freeport provides excellent opportunities to expand and enhance this through the growth of existing AM activities and by attracting new AM activities into the region. There is also opportunity to apply advanced manufacturing principles to enhance the performance of existing manufacturing activities to make them more efficient, productive and sustainable.

### **Key Advanced Manufacturing Sectors**

The key manufacturing sectors in the Humber include:

- Chemicals/cement/steel
- Oil and gas
- Offshore wind energy
- Clean energy
- Food
- Health, pharmaceutical and medical devices
- Leisure homes and modular buildings

These sectors are energy intensive and, in many cases, result in significant carbon emissions and so it is critical that innovation adopts low/zero carbon technologies and that the AM strategy is aligned with the Freeport energy innovation and decarbonisation strategies. As employment declines in older, high-emitting industries, it is vital that the AM strategy aligns with and informs the Freeport skills strategy to ensure AM companies and their supply chains have the skills and cultures to absorb and exploit innovation.

### **Strategic Objectives**

- Ensure that the Humber region has an innovation ecosystem which makes it attractive to organisations seeking to establish new AM activities
- Ensure that organisations with existing manufacturing activity within the Humber region increase productivity, establish new products and access new markets while ensuring energy efficiency and sustainability
- Promoting the development of local supply chains for key AM sectors
- Through working in partnership with other organisations within the Humber, nationally and internationally the FILG will:
  - Develop a coherent and compelling offering of innovation support for AM organisations within the freeport and the wider Humber across technology and manufacturing readiness (TRL/MRL) levels
  - Identify opportunities and challenges for innovation in AM and develops approaches to address the challenges and maximise the opportunities, including cross fertilisation between AM sectors
  - Ensures the Humber maximises its share of AM innovation funding by helping current and potential AM organisations to access funding
- Aligns with and informs other relevant Freeport and devolution plans covering energy, ports and logistics, decarbonisation and skills

### **Supporting Innovation**

The FILG will accelerate innovation in AM through identifying common challenges and providing tailored support. It will build on existing and emerging areas of expertise and ensure alignment between key centres of excellence within the region including Hull and Lincoln universities, ORE Catapult, Aura/Aura Innovation Centre, The Bridge, LIAT, NCFM and Catch alongside national/regional bodies such as Made Smarter, MakeUK, Northern Powerhouse Partnership and key extra-regional organisations such as University of Sheffield/Advanced Manufacturing Research Centre, High Value Manufacturing Catapult and National Composites Centre. The FILG will also promote the benefits for AM organisation of accessing Freeport incentives and promote opportunities for regional AM organisations to engage in public and private innovation funding programmes such as UKRI, Innovate UK programmes and the Offshore Wind Industrial Growth Plan and support these organisations to maximise their chances of gaining funding. It will disseminate examples of success to raise the profile of the Freeport and the region, encourage innovation within existing organisations in the region and attract organisations considering establishing activities



within the Freeport and wider region.

**Mission** – To attract new advanced manufacturing companies to the region and to accelerate the adoption of advanced manufacturing techniques and equipment by existing business.

**Outcomes:**

- New manufacturing companies setting up in the Humber Freeport use AM where possible
- Grow the % of existing manufacturing companies in the area using AM
- Increase the active collaborations (business to business, business to academia) supporting business growth and development of new products or services
- Local supply chain is informed of opportunities and engaged with the customer base

**Tactics:**

- Set expectations about new businesses using AM
- Supporting supply chain development through tax site investment
- Building a collaborative innovation ecosystem

## Ports and Logistics

The Humber is the busiest port complex by tonnage in the UK with more than 15% of all UK seagoing freight passing through one of the ports in and around the estuary. The port complex handles all types of commodities and types of vessels and serve as a critical base for various renewable energy assets. Besides sea routes, the Humber is also connected through pipelines, an international airport, well developed motorways, rail connections and inland waterways. It is at the centre of key freight corridors connecting Europe to Leeds, Manchester, Liverpool, Northern Ireland and the Midlands. The strategic importance of The Humber for the UK economy as a logistics hub is therefore clear.

Furthermore, there are a number of key manufacturing and processing sectors based around the Humber that requires effective and efficient logistics solutions to be viable and successful. This includes chemicals, oil and gas, food and agriculture, pharmaceutical and timber-based manufacturing. The Humber is also at the centre of the renewable energy revolution with large-scale construction and maintenance of offshore wind and hydrogen assets.

The movement of goods generate roughly 10% of all carbon emissions world-wide. Due to the complex landscape of logistics, it is also the most challenging sector to decarbonise. This further emphasises the importance of innovation in the sector.

The role of freeport centric innovation in ports and logistics will be to:

- Enhance sustainable efficiency, resilience, and safety of all logistics operations in the region.
- Develop opportunities to increase the value add to goods passing through the region
- Support the road to net-zero through decarbonisation of ports and logistics,
- Support the road to net-zero through logistics support for the renewable energy industry
- Stimulate growth of a world class ports and logistics services sector in the region
- Establish the Humber as the most innovative ports and logistics centre in the UK

Examples of port and logistics innovation that could be of particular interest to the region are:

- Cost effective solutions to increase the use of rail freight
- Use of AI and blockchain technology to increase efficiency and safety of processing cross-border trade
- Cost effective and safe solutions to distribute and deploy renewable energy
- Better operational coordination and communication in multi-modal transport chains

- Decarbonisation of port operations
- Use of data and AI applications to identify logistics risks and improve resilience
- Real world testing of renewable energy use in logistics
- New supply chain models that optimise the opportunities presented by the Freeport and address challenges presented by increased border controls.
- Deployment of automated equipment in appropriate areas, e.g. driverless port vehicles.

As an ecosystem containing almost all types of logistics operations and challenges, and being at the centre of the energy revolution, the Humber is well positioned to serve as a representative testbed for the real-world deployment of innovative ports and logistics solutions.

Ports and logistics innovation capabilities are provided by various higher education resources in the region, including the Universities of Hull and Lincoln, Humber College, and CATCH. The Logistics Institute (University of Hull), founded in 2008, is dedicated to logistics research and innovation.

## Governance

The Freeport Innovation Liaison Group (FILG) will act as the overarching body, with membership and governance arrangements as set out in the Terms of Reference. It sits alongside the Decarbonisation and Skills groups with the Chair from each having representation on the Humber Freeport Board to update on activity and highlight delivery and investment opportunities.

The FILG will act as a conduit for collaboration, brokering discussions between business, academia, investment, and expertise, to establish empowering relationships which facilitate the development of ideas. The FILG will research and disseminate good practice by partnering and creating links with other Freeports and institutes to share learning and experiences. The FILG will use the agreed Plan on a Page document and subsequent 3-year delivery plan as the basis for driving activity with a view to facilitating and driving the Freeport objectives.

## Cross Cutting Strands

Innovation, along with Net Zero and Skills is one of three workstrands being developed by the Humber Freeport.

Each of these themes has a lead representative who has observer status on the main Humber Freeport Company Limited board. This ensures a robust and two-way contribution to the board's strategic direction and theme development.

## 6. Our Innovation Assets

### Supporting national decarbonisation, energy security and growth agendas for the UK

- Offshore Renewable Energy Catapult
- Orsted & RWE (Hornsea 1, 2, 3, 4; Humber Gateway, Grimsby)
- Siemens Gamesa Blade Manufacturing Plant - This £310m wind turbine blade factory has already created over 1000 job opportunities and was expanded in 2023 to increase capacity.
- Able Marine Energy Park Zone - Able Humber Port (AHP) is located on the south bank of the river Humber and provides 285 hectares of land plus an additional 43.7 hectares of new quayside when developed. 178 hectares of this land is designated as a Freeport Tax Site.
- AURA CDT (Centre for Doctoral Training) - driving innovation in OSW Energy and the environment  
[Aura Innovation \(aura-innovation.co.uk\)](https://www.aura-innovation.co.uk)

- OYSTER project – consortium will develop and demonstrate a system designed to be integrated with offshore wind turbines to produce green hydrogen [Oyster Project \(oysterh2.eu\)](https://oysterh2.eu)
- Developed by RWE Humber Gateway is located 8km off the East Yorkshire coast, just north of the mouth of the river Humber. It can generate enough electricity to power up to 199,000 UK homes, and its operations and maintenance base is in Grimsby. In 2015 the 219-megawatt wind farm became fully operational with all 73 turbines generating two months ahead of schedule.
- The £200m Yorkshire Energy Park - a next generation energy and technology business park that will drive economic growth, support the local community, and help position the Humber at the forefront of the global transition to net zero [Yorkshire Energy Park | Homepage \(yorkshire-energy-park.co.uk\)](https://yorkshire-energy-park.co.uk)
- Hull East Tax Site - 197ha on the Estuary's north bank adjacent to Pensana Rare Earths' £90m oxides processing facility site
- Equinor's flagship H2H Saltend project leading to a step change in decarbonising one of the largest chemical hubs in the UK by enabling a switch to hydrogen in the nearby Saltend Chemicals Park, already home to multinationals such as Ineos and Nippon Gohsei
- Saltend Chemicals Park - enabling large-scale production of low carbon chemicals and low carbon maritime refuelling at the Port of Hull
- Croda £24m distribution centre. The new warehouse space, in the Goole 36 enterprise zone, will act as a worldwide distribution hub for chemical products made at its sites in Hull and Rawcliffe Bridge
- BECCS - Bioenergy with CCS at Drax – producing negative emissions and sustainable renewable electricity
- Humber Zero - A world-scale CO2 reduction project that involves carbon capture utilising new technology. Participants include Phillips 66 Limited and VPI Immingham
- SSE Thermal and Equinor are developing Keadby 3 Carbon Capture Power Station, which could become one of the UK's first power stations equipped with carbon capture technology
- Prax Group plans to deploy carbon capture technology at Lindsey Oil Refinery as part of the proposed East Coast Cluster and V Net Zero Pipelines to capture >85% of our CO2 emissions [East Coast Cluster](#)
- ZerCal250 – Origen-Singleton Birch's lime production process without producing CO2 [ZerCal250 \(investhumber.com\)](https://investhumber.com)
- Aldbrough Hydrogen Storage project led by SSE Thermal and Equinor could be in operation by early 2028, with an initial expected capacity of at least 320 Gigawatt hours (GWh), which is enough to power over 860 hydrogen buses a year [Aldbrough Hydrogen Storage](#)
- Gigastack - UK's flagship green hydrogen project, led by a consortium of Phillips 66 Limited, Ørsted (UK) Limited, ITM Power (Trading) and Element Energy Limited. The project aims to harness offshore wind to power electrolysis and produce hydrogen, a low-emission fuel, to power industry [Gigastack phase 2 | Ørsted \(orsted.co.uk\)](https://gigastack.co.uk)
- Refinery of the Future - Phillips 66 Limited, the only producer in Europe of specialty graphite coke used in lithium-ion batteries and the only UK refinery to make and supply sustainable aviation fuel at scale
- Rough Hydrogen Storage - Centrica's redevelopment of Rough would provide 10 TWh of hydrogen storage capacity to UK infrastructure [Centrica re-opens Rough storage facility](#)
- Led by Harbour Energy, V Net Zero will develop the infrastructure to transport and store CO2 in secure offshore storage sites
- Shell and Uniper are progressing plans to produce blue hydrogen at Uniper's Killingholme site on the South Humber Bank. Humber H2ub (Blue) aims to produce low carbon hydrogen at Uniper's

Killingholme site and is expected to capture approximately 1.6 MT CO<sub>2</sub> p.a. and be operational later this decade [Project Humber H2ub | Uniper](#)

- VPI Immingham and Air Products have entered a joint development agreement to drive forward the Humber Hydrogen Hub (H3), which seeks to develop a flagship 800 MW low carbon hydrogen production facility in Immingham [Air Products and VPI Sign Joint Development Agreement for Large-scale, Low-carbon Hydrogen Production in Humber](#)
- Air Products and ABP are working together on a new green energy terminal in the Port of Immingham. The terminal will be a key piece of national infrastructure [Immingham Green Energy Terminal \(airproducts.co.uk\)](#)
- SSE Thermal and Equinor are developing Keadby Hydrogen Power Station located in North Lincolnshire, this could be the world's first 100% hydrogen-fuelled power station, producing zero emissions at the point of combustion
- Humber Low Carbon Pipelines project led by National Grid will provide the vital infrastructure required to unlock the potential of the Humber region by providing connections to the various decarbonisation projects [National Grid announces preferred route for pipelines to decarbonise Humber industry | National Grid Group](#)
- British Steel's ambition for low-embedded carbon steel production with a phased reduction of CO<sub>2</sub> intensity by 2035 and 2050 [Sustainability \(britishsteel.co.uk\)](#)
- Goole Tax Site 198ha of undeveloped agricultural land, and an extension of the Goole Enterprise Zone
- Siemens' £200m new rail factory and £7m Raise Innovation Centre where Siemens, ERYC, the University of Birmingham and UKRRIN collaborate [RaisE - University of Birmingham](#)
- University of Hull Logistics Institute [Logistics Institute | University of Hull](#)
- The Smart Sustainable Circular Chain LAB and [Lincoln International Business School | University of Lincoln](#) (LIBS) focused on Ports and decarbonisation in shipping

### Academic Offer & Opportunities

- Aura consortium and Aura Innovation Centre [Aura Innovation \(aura-innovation.co.uk\)](#) - offer wide-ranging support to Net Zero transition
- Broad academic base & collaboration with industry and other universities, including cross university energy and decarbonisation expertise and sector support
- The Logistics Institute and Hull University Business School - modern logistics and supply chain management
- Wider innovation collaborations – Humber OSW Cluster, East Coast Cluster (Teesside), Liverpool-Humber Optimisation of Freight Transport project (LHOFT), Advanced Manufacturing Research Centre links to Humber FILG (University of Sheffield), rail innovation via Raise (University of Birmingham)
- National Centre for Food Manufacturing [National Centre for Food Manufacturing | College of Health and Science | University of Lincoln](#)
- The Bridge, Advanced Manufacturing R&D Centre (UOL) [The Bridge | Lincolnshire's Advanced Engineering Materials R&D Centre \(thebridge-lincoln.org\)](#)
- Lincoln Institute for Agri-Food Technology (LIAT) global agri-food robotics and automation [Lincoln Institute for Agri-Food Technology | College of Health and Science | University of Lincoln](#)
- The Smart Sustainable Circular Chain LAB and [Lincoln International Business School | University of Lincoln](#) (LIBS) around logistics and energy intensive industries
- School of Engineering (University of Lincoln) - work on industrial decarbonisation
- Food trade and logistics skills, knowledge, and innovation hub with local, national, and global outreach

- University of Hull's Energy & Environment Institute – offering support in environmental impact, flooding and understanding of Climate Change

### Social Value Added

- Lincoln International Institute for Rural Health (LIIRH) - interdisciplinary research to address the most important health issues facing rural communities locally, nationally, and internationally. The institute brings together world-leading specialists, conducting research across a range of rural health related concerns
- College of Social Science at University of Lincoln has academic expertise on governance, policy engagement and public communication
- University of Hull's Wilberforce Institute which deals with modern slavery

## 7. Case Studies

### Advancing Offshore Wind



The UK's offshore wind sector is pivotal for achieving Net Zero goals, set to increase from 14 GW to 50 GW by 2030. Innovation, including robotics and digital technologies, is crucial for success, making operations smarter, safer, and more sustainable.

This not only translates to more clean energy but also creates high-skilled jobs and significant export opportunities for UK businesses.

With the sector's expansion, effective asset management is vital, with O&M costs comprising a significant portion of total lifetime expenditure. To address this, Industry 4.0 technologies are being used to lower costs, cut emissions, and improve safety.

The 5G PORTAL (Ports and Offshore Renewable Technology Accelerator Lincolnshire) is a cutting-edge private 5G zone covering Grimsby port and the Lynn and Inner Dowsing wind farm, facilitating technology development and trials.

By harnessing 5G advantages, such as low latency and high bandwidth, the 5G PORTAL contributes to a sustainable future, driving the offshore wind industry forward.

Key Points about the 5G PORTAL:

**Purpose:** Accelerate the development of digital technologies essential for the expansion and evolution of offshore wind assets.

**Funding:** A £2.8 million investment funded by Innovate UK, the Greater Lincolnshire LEP, and industry partners.

**Consortium:** Led by the Offshore Renewable Energy (ORE) Catapult, the consortium includes Microsoft, XceCo, Associated British Ports (ABP), Accelleran, JET Connectivity, Boldyn, and Satellite Applications Catapult.



**Cutting-Edge Technology:** The 5G PORTAL allows technology providers to develop, test, and refine solutions that keep the UK at the forefront of off shore wind innovation.

## Enabling Future Innovation Through Targeted Skills Investment

CATCH, based in Stallingborough, has unveiled its ambitious plan to combat engineering construction skill shortages across the UK.

- New £60m state-of-the-art training facility
- CATCH aims to train 1,000 apprentices by 2029
- Enhanced transportation for access from Lincolnshire and Yorkshire



With upcoming Net Zero projects expected to generate 20,000 new industrial jobs, the demand for skilled workers is set to soar. To meet this demand, CATCH has secured funding from key sponsors, the Engineering Construction Industry Training Board's (ECITB) and CATCH members, Phillips 66 Limited, Harbour Energy, and VPI Power. The expansion of the training centre includes a national net zero conference and learning centre, classrooms, a welding and fabrication hub, and an outdoor Process Unit Training Module.

Speaking about the plan, Catch CEO David Talbot said: "Our phased strategy ensures a sustainable expansion of apprenticeship numbers. The backbone of this initiative's success will be the support from the industrial supply chain. Many companies understandably are waiting to assess the skills landscape before committing to expanding or creating new apprenticeship vacancies. Our proposed new facility helps to mitigate this risk, with dedicated support from the CATCH team, the industrial supply chain can be confident that together we can ensure that the skills pipeline is sustainable for the low carbon future."

CATCH's plan not only addresses immediate skill shortages but also sets the stage for a sustainable, net zero future, ensuring the UK remains at the forefront of environmental innovation.

## Innovating Towards a Green Future: Ørsted's Vision



"We must accelerate radical innovation now – so we can proactively build the sustainable green energy system of the future." David Bould, Head of UK and Ireland Ventures and Open Innovation © Ørsted

Ørsted, driven by a vision for a world powered entirely by green energy, recognises the urgent need for radical innovation in the energy sector. To achieve this goal and ensure sustainable, affordable energy for all, Ørsted emphasises the necessity of transforming the entire energy system.

In June 2023, Ørsted launched the UK and Ireland Innovation Hub:

- Aims to accelerate the next generation of renewable innovation and find solutions
- Backed by an initial £500,000 investment
- Working with start-ups, academia, related industries, and the investment community

Ørsted's commitment to environmental sustainability extends beyond energy production. Coastal habitats are unsung heroes in the fight against climate change. They're also biodiversity-rich ecosystems teeming with life. But these essential habitats are declining. In the UK Humber Estuary, Ørsted have embarked on a seascape restoration project – Wilder Humber – to improve the health and resilience of the estuary's ecosystem.

Through partnerships with innovative startups like Spoor, Ørsted leverages technology to monitor wildlife interactions with wind farms, informing better planning for sustainable energy infrastructure.

Hornsea 1 and 2 showcase Ørsted's leadership in offshore wind innovation, providing clean energy to over one million homes. Looking ahead, projects like Hornsea 3 and 4 drive further advancements in the UK offshore wind sector.

With a history of fruitful collaborations and a commitment to transformative innovation, Ørsted continues to pioneer the global transition to green energy, ensuring both financial growth and environmental stewardship.

### Floreon Technology Ltd

While traditional engineering plastics are made from fossil resources, Floreon harnesses the power of plants by transforming Polylactic Acid (PLA) into a durable engineering polymer. Unlike typical PLA, often limited to disposable uses, Floreon's pioneering technology elevates it for durable applications. The game-changing breakthrough lies in achieving a UL94V-0 fire

resistance rating using a halogen-free flame retardant within PLA, a first in the world. With a carbon footprint up to seven times lower than traditional plastics, Floreon is the best choice as a high-performing sustainable material.



- Based at the Aura Innovation Centre in Hull
- Founded in 2011 by local entrepreneur, Shaun Chatterton, following a successful Knowledge Transfer Partnership with Sheffield University.
- They are a cutting-edge sustainable materials technology startup dedicated to revolutionizing the plastics industry with innovative bioplastic compounds.

Floreon recently received funding from Northern Gritstone (£2m), an independent investment company supporting the leading businesses of tomorrow which emerge from the world-class science and innovation hub that is the North of England today. The funds are being used to scale up the manufacturing of Floreon bioplastic compounds and to help the business achieve commercial success in a wide range of B2B markets such as building & construction, electrical products, appliances, medical devices, automotive and aerospace, and technical packaging.

Floreon fully utilises the technical facilities and support services provided by the University of Hull. This is enabling Floreon to pursue the development of new PLA-based compounds, with the latest R&D activities focusing on biodegradable grades, both industrially and home compostable for use in applications where recycling is not an option.



## Grimsby Fish Van Fleet Goes Electric



A project led by the University of Lincoln's National Centre for Food Manufacturing (NCFM) with support from the Seafood Grimsby and Humber Alliance and funded by the Greater Lincolnshire Local Enterprise Partnership, UK Government and Toyota UK is progressing a trial to explore optimal energy use in electric vans used for seafood delivery across the country.

The Grimsby seafood processing cluster is the largest seafood processing and trading cluster in Europe:

- 6,000 employees, with a further 12,000 in the supply chain
- The vans remain reliant on traditional diesel engines and electrical refrigeration systems and are estimated to have a carbon footprint of 2,000 CO<sub>2</sub> tonnes per year
- Project is looking to reduce this significantly with well over 100 independent fish vans currently operating in and around Grimsby.

NCFM is overseeing the project, monitoring the carbon impact and assessing the cost effectiveness of full transition to Electric Vehicles. The University of Lincoln is also exploring innovation and knowledge exchange as part of the project, including how the vans perform in terms of carbon reduction and cost savings and what could be done nationally to increase the wider take-up of electric vehicles for food delivery.

South Humber and the Freeport Boundary lie within the UK's Food Valley and decarbonisation of the food sector and its logistics chain is a high strategic priority, building on the £350,000 for Seafood Skills Training already invested from the UK Seafood Fund.

During initial discussions with businesses, it was identified that the current 240-mile limitation on a single charge for Electric Vehicle (EV) Fish Vans would inhibit uptake if it was assumed that current routes would be undertaken on a single charge. For EVs to be feasible for a larger proportion of the Grimsby Fish Van fleet, charging during the round must be adopted. Thus, geographical information systems (GIS) models have been established for the National Charge Point Registry (Department for Transport data). Charging point distribution comparing Lincolnshire and London has set things in context for the local area.

Initial assessments are under way for feasibility of a move to EVs and company data is being shared for the movement of 20 fish vans for a week. Current information suggests that, on average, these vehicles travel 255 miles per day – more than the 240-mile limitation, but with faster charger numbers on the rise, partial charging during lunch breaks or stops could make EV Fish Vans a more viable proposition. Assuming a 240-mile-per-day maximum charge, 47.8% of tested routes and 20% of vans could be replaced with EVs. A more likely figure is

200-miles-per-day, as the vans are refrigerated, and models suggest that a fully loaded vehicle can lose up to 15% of its maximum range. Ultimately, GIS models will enable testing of the opportunity for EV replacement of the Grimsby Fish Van fleet.

Initial temperature data has also been shared with the project team and primary assessments are underway to look for patterns in this data for comparison to EV data captured when the vans are on the road.

Life Cycle Assessments (LCA) and carbon foot-printing for EV fish vans and their diesel equivalents are also under way to evaluate the true environmental impact of this change. EVs are often purported to be more environmentally friendly than their diesel/petrol counterparts but how much so is not frequently reported and is variable dependent upon the usage of the vehicle. These assessments specifically for fish vans will allow reporting of the decarbonisation impact of these changes for specific businesses should they be implemented.



## Appendix A – Humber Freeport Links to UK Innovation Strategy 2021

Pillar 1: Unleashing business to fuel businesses who want to innovate by:

- Increasing annual public and private investment in R&D.
- Identifying potential innovation led seed funding opportunities.
- Working with and sharing progress with the National Innovation Hub, Innovate UK and British Business Bank.
- Putting forward key innovation led infrastructure priorities for investment.
- Reviewing regulatory barriers in our ports, customs and tax sites.
- Helping Freeport related businesses to introduce and scale innovations across international markets by making the right connections.
- Supporting businesses in adopting digital technologies and AI.
- Accelerating growth in the Humber's most innovative businesses.
- Exploring further adoption of the Made Smarter Programme and advanced industrial digital technology amongst manufacturing SMEs in the Humber.

Pillar 2: People - making the UK the most exciting place for innovation talent through:

- Identifying critical emerging innovation skills gaps in the Humber and working with IUK, our universities and others to address these.
- Working with the Connect Places Catapult on bespoke initiatives/workshops

Pillar 3: Institutions and places - ensuring research, development and innovation institutions serve the needs of businesses and places across the UK by:

- Supporting and working with businesses to develop R&D capacity and support local growth.
- Helping drive further economic growth through university-business innovation.
- Using Humber Freeport Innovation Collective to make cross institutional connections.

Pillar 4: Missions and technologies – stimulating innovation to tackle major challenges faced by the UK and the world and drive capability in key technologies by:

- Establishing business-led research projects to develop transformational new technologies.
- Identifying how the Freeport can locally respond to the key seven technology families that will transform the UK economy in the future, in particular Energy and Environment Technologies and advanced materials and manufacturing.