# Humber Estuary Plan

Final draft

January 2021

# Contents

# Introduction

The Humber Estuary is home to one of the UK's most significant industrial clusters, spanning both banks. Known as the Energy Estuary, it has long been a primary location for energy generation and energy-intensive industries such as oil refining, chemicals and steel. It has recently become the main centre for developing the UK's world-leading offshore wind sector and is now a focus of plans for industrial decarbonisation.

With over 40,000 shipping movements each year, the Humber ports are the UK's largest by tonnage for both import of raw materials and components and export of UK manufactured products. They support a diverse range of manufacturing activity, which accounts for a quarter of the wider Humber region's £20.23bn Gross Value Added (GVA) – far higher than the national and regional averages.

As the eastern gateway to the Northern Powerhouse and the Midlands Engine, part of the land bridge between continental Europe and Ireland, the Humber ports are a vital part of the UK's strategic transport infrastructure – making efficient access by road, rail and inland waterway essential. Humberside Airport meanwhile provides fast access to continental Europe with several daily flights to Amsterdam and its onward connections across the world, while Manchester Airport's international links are also in relatively easy reach.

The Humber Bridge links the two banks of the Estuary. Since tolls were halved in 2012, the Humber economy has started to become more integrated. There were 9.8 million trips across the Bridge in 2017/18, 52% more than in 2012. 92% of these were cars, with analysis showing a large increase in commuting across the river.

Recent flagship investments – such as from Siemens Gamesa and Ørsted in the offshore wind sector; Ineos and Croda in chemicals; RB and Smith & Nephew in healthcare; and Wren Kitchens in assembly – together with a strong SME base, including a fast-growing tech cluster, have enabled the Humber to make strides in improving economic performance over the last decade.

However, the Humber still has a legacy of pockets of deprivation and there are some communities, particularly in urban areas and on the coast, which have not shared in the proceeds of national economic growth.

The region also faces a growing threat from climate change: the second highest flood risk in the country, combined with the largest cluster of energy-intensive industries, emitting more carbon dioxide than anywhere else in the UK. These essential industries produce products that society and the economy depend on, and account for around a quarter of the value of the Humber's economy and a disproportionate number of its higher-paid, higher-skilled jobs – but they will need to adapt.

# About this plan

This plan marks the start of the next phase of working together to grow the Humber Estuary economy, building on the progress the region has made over the last ten years.

The strategically important assets and sectors that set the Humber Estuary apart – our ports, energy, chemicals and process industries, and the unique natural resource of the Estuary – are what bind us together. Industries on the Humber make products like steel, pharmaceuticals, paint, plastics and petrol that society depends on, while the energy generated here and off our coast keeps Britain's lights on and homes warm. The success of the Humber Estuary economy is vital for the communities that live around it and is integral to the UK's prosperity.

Like the Estuary itself, the industries that surround it continually evolve. Recent years have brought major investments in offshore wind manufacturing, operations and maintenance, drawing on the region's maritime and light engineering heritage; healthcare technology and pharmaceuticals, building on their long history in Hull; and energy generation, including energy from waste. New manufacturers have been attracted to the region by its connectivity, skills and availability of land, while new and existing SME suppliers have grown and diversified.

In the last decade we have also seen some difficult times, with steel under threat from global competition but now on a sounder footing, and other plants closed or mothballed due to policy changes, economic conditions or restructuring of international businesses. In 2020, as the world was gripped by the coronavirus pandemic, the Humber ports and industries continued to play their vital role, but they are not immune from the wider downturn in the economy.

Looking ahead, the Humber Estuary economy faces three significant challenges:

- the need to transition from being the highest carbon emitting industrial cluster in the UK to net zero emissions, whilst protecting employment and ensuring the sustainability of industries;
- as an outward facing region, adjusting to the UK's new trading relationship with the EU; and
- living with a growing flood risk from rising sea levels.

In each of these lies opportunity to attract new investment and strengthen the existing Estuary economy – opportunities where the Humber is at its strongest when it works together, public and private sectors on both banks of the Estuary.

This plan sets out a framework for the next phase of collaboration across the Humber Estuary economy, based on the following shared strategic opportunities:

1. **Accelerating clean growth:** becoming a global leader in the transition to net zero carbon emissions; driving further growth from clean energy generation and securing the long-term competitiveness of energy-intensive industries.
2. **Developing the Humber's ports and manufacturing clusters:** handling more of the UK's future international trade and capturing more value-added activity from the Humber's ports, particularly in engineering and assembly sectors.
3. **Managing the Humber Estuary asset:** alleviating the risk of flooding to communities and industries around the Humber Estuary, facilitating new developments and jointly managing the Estuary's unique natural resources.
4. **Attracting and delivering new investment:** utilising the powers and resources of the partners to respond to major opportunities, and market the Humber proposition for external investment.

This plan is owned by the Humber Leadership Board, a statutory joint committee of the four Humber local authorities with the two Local Enterprise Partnerships (LEPs), and will be delivered in partnership with organisations across the region.

Proposals being developed for devolution in Hull & East Riding and Greater Lincolnshire offer the potential to accelerate the progress being made in the Humber economy, by placing more of the powers and resources required to support growth in the hands of local leaders. In preparation for this, the longstanding "overlap" of Local Enterprise Partnerships (LEPs) in Northern Lincolnshire will end on 31 March 2021, with North & North East Lincolnshire retaining full membership of the Greater Lincolnshire LEP and the Humber LEP being reformed into a Hull & East Yorkshire LEP.

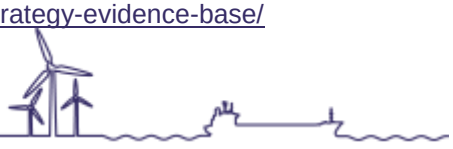
Continuing strong collaboration between public and private sectors across the Humber Estuary – through local authorities, future mayoral combined authorities and LEPs – will be vital for realising the potential of its shared opportunities.

This plan provides the framework for that collaboration and the first set of actions to take it forward, which will be complemented by wider actions on innovation, business, infrastructure and skills that will be set out in the two LEPs' economic strategies in due course.

It is closely aligned with the Northern Powerhouse's prime and enabling capabilities as set out in the Independent Economic Review[1], and supports the Government's aim of levelling up through a green recovery. It paves the way for further strengthening the Humber's specialisms, increasing the strategic contribution it makes to the UK economy, and building on its successes of recent years.

The plan is built on robust evidence and local and national stakeholder engagement, drawing in particular on the work led by the Humber LEP to develop a draft local industrial strategy with Government before the 2019 general election, and work by partners to understand the impact of coronavirus on the Humber economy during 2020. Both included extensive business and stakeholder engagement. The supporting evidence base is available online.[2]

[1] http://www.sqw.co.uk/insights-and-publications/northern-powerhouse-independent-economic-review/
[2] https://www.humberlep.org/strategies-and-deals/industrial-strategy/industrial-strategy-evidence-base/



# Accelerating clean growth in the Energy Estuary

## Our priorities

The Humber Energy Estuary is at the heart of the UK's energy supply, and one of its main industrial clusters. The Humber is central to the government's vision of achieving net zero carbon emissions by 2050, and is ideally placed to develop, test and roll out renewable energy innovations, building on its strong foundations in clean growth.

**Our shared priorities for clean growth are:**

1. To be a net zero carbon industrial cluster by 2040, and significantly lower carbon by 2030, whilst protecting strategically important industries and maximising benefits for local communities and businesses.
2. To support the long-term sustainability of existing industries through decarbonisation, diversification and reinvestment.
3. To leverage the development of low-carbon infrastructure to attract new investment and develop local supply chains, skills and innovation.
4. To continue to develop the region as a trailblazer for clean energy generation, growing the Humber energy cluster and establishing the region as a global leader in smart offshore wind operations and maintenance by 2030.

## Decarbonisation

**Decarbonisation is the most significant challenge and the greatest opportunity for the Humber.**

The UK is the first major economy in the world to pass laws to end its contribution to global warming by 2050.

Decarbonisation matters more to the Humber than most places in the UK:

- The Humber is especially vulnerable to climate change, with an economy dependent on water and the second highest flood risk in the country;
- The Humber's industrial cluster emits more $CO_2$ than any other UK cluster (30% more than the next largest)[3]. Total emissions from industry and linked power production (such as for steam) stand at

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/803086/industrial-clusters-mission-infographic-2019.pdf

14.8Mt$CO_2$ per year[4], or 15.9 tonnes of $CO_2$ for each Humber resident – more than double the national average;

- Energy intensive industries, which are also directly and indirectly large emitters of $CO_2$, account for 23% of the value of the Humber economy and around one in ten jobs. If not carefully managed, decarbonisation could be a serious economic shock;
- Decarbonisation is a major economic opportunity. Nationally, low carbon sectors are growing significantly faster than the wider economy, and the Humber has already become a magnet for the renewable energy sector. World-leading businesses are developing plans for investment in low carbon infrastructure in the region.

We will need to be ambitious in reducing the Humber's net $CO_2$ emissions to enable the UK to meet its climate change obligations. The Humber could make a greater direct contribution to reducing UK emissions than any other place, but there is no single solution or organisation that can achieve this alone. Realising this opportunity will require sustained action over the coming years, and collaboration amongst many organisations.

The Humber's contribution towards the UK's decarbonisation goals is multi-faceted:

- it is a leading location for the transition to clean energy, with a substantial concentration of renewable energy generation assets and businesses;
- it has a large and dynamic industrial cluster that can anchor the deployment of low carbon infrastructure, in support of the government's Industrial Clusters Mission; and
- it has rich natural capital which can be enhanced to support increased carbon sequestration.

By acting across these areas, the Humber aims to become a global exemplar industrial region that transitions to net zero $CO_2$ emissions, delivering maximum economic and social benefits to its residents, whilst pioneering a model that could be replicated nationally and internationally.

The Humber will need to go further and faster than other places to make the change whilst safeguarding its industrial base and communities. This will require cross-sectoral collaboration and innovative models for financing and delivering the changes required, but it will also create new opportunities for jobs and local businesses, and support wider cross-economy decarbonisation.

However, although acting on decarbonisation will reduce the Humber's contribution to climate change, it will not eliminate the impact. The Humber remains vulnerable to rising sea levels, and considerable investment will be required to implement the Humber 2100+ flood risk strategy that is currently being developed, building on the £150m invested as a result of the current Humber Strategy.[5] Communities and businesses around the Humber will need to become more resilient to climate change, supported by projects such as Living with Water and Ark.

[4] HIDR Baseline Local Emissions Assessment (Element Energy, 2020); UK local authority and regional carbon dioxide emissions national statistics (2017); Humber Local Energy Strategy (Siemens, 2019)
[5] https://consult.environment-agency.gov.uk/humber/strategyreview/

# Energy intensive and continuous process industries

**The Humber is home to a well-established cluster of energy intensive and continuous process industries[6] that are strategically important to the UK and the wider economy.**

The cluster accounts for almost a quarter of the Humber's GVA, with the highest concentration of direct employment in the Northern Powerhouse and further employment in supply chains. It has the potential for further growth, but also faces challenges from global competition and the need to decarbonise.

Key assets include:

- Two of the UK's six oil refineries, Phillips 66's Humber Refinery and the Total Lindsey Oil Refinery, accounting for around 25% of UK capacity, and biofuel producers like Greenergy.
- British Steel's Scunthorpe steelworks, bought by Jingye Group in March 2020, one of two integrated steelworks in the UK.
- Two major chemicals clusters, Saltend Chemicals Park and the South Humber Bank, making the Humber one of the UK's four main chemicals-producing regions.[7] Businesses include Air Products, BOC, Ineos, Nippon Gohsei, PX Group, Tronox and Solenis.
- Lime and glass manufacturing plants, with companies like Singleton Birch and Guardian Industries.
- One of the UK's largest concentrations of food manufacturing and cold storage, with businesses including Youngs, Hilton Seafoods and Morrisons.
- Leading healthcare technology and pharmaceuticals businesses like Smith & Nephew, RB and Indivior.

Global competitiveness is vital for the many large businesses in these sectors that supply European and North American markets from the Humber. The Humber produces both high quality commodity products, which face competition from low-cost overseas producers, and speciality products. Some businesses have regularly reinvested large sums to maximise efficiency; for example, Phillips 66 has invested £1.5bn in capital and maintenance since 2005. Recent sales – of British Steel to Jingye Group and BP Chemicals to Ineos – as well as the planned sale of Total Lindsey Oil Refinery to Prax, offer the potential for further re-investment.

With large multinational businesses prevalent in some sectors, the Humber needs to compete for investment and expansion projects against other sites around the world, and risks being negatively impacted by global strategic business decisions. Attracting new R&D investment and diversifying into new products has helped some businesses to strengthen their positions in the Humber.

However, a few plants face an investment gap – highlighting an underlying vulnerability in the Humber's industrial base. The investment required to reduce or eliminate emissions will also be significant and needs to be made in a way that does not undermine the competitiveness of these sectors in the Humber or

[6] Energy intensive industries are industries where energy usage makes up a significant part of production costs. Continuous processing describes manufacturing where materials are undergoing chemical reactions or treatment continuously 24 hours a day.

[7] https://www.parliament.uk/documents/commons-committees/Exiting-the-European-Union/17-19/Sectoral%20Analyses/7-Sectoral-Analyses-Chemicals-Report.pdf

offshore the UK's carbon emissions. Achieving this balance would position the Humber as a global exemplar in transitioning to clean growth and support the area's potential for attracting new low carbon manufacturing.

## Leading the transition to net zero

> **"The Humber is the backbone for our green transition and an example to the many other industrial centres across the UK that they can go green: a crucial message for our economic recovery from coronavirus."**
>
> *Kwasi Kwarteng MP, Secretary of State for Business, Energy and Industrial Strategy*[8]

The Humber cluster is at the forefront of plans to decarbonise industry in the UK, because of its scale and opportunities to deliver rapid results. Its carbon emissions are the highest of any UK industrial cluster, and it consumes an estimated 8,000GWh of energy per year – 6% of England's industrial and commercial energy usage – at a cost of around £330million[9]. The area's high availability of renewable energy and close proximity to large available storage sites – including Endurance, the UK's most geologically understood – means there is potential to deliver substantial reductions in carbon emissions by 2030, and reach net zero by 2040.

The Humber's priority is to develop a proactive, managed approach to decarbonisation that protects the long-term competitiveness of existing strategically important industries whilst generating new value from the UK's transition to a net zero carbon economy. To achieve this, partners around the Humber are working on the development of a Cluster Plan.

### Humber Cluster Plan

The Humber Cluster Plan will provide an evidence-based framework for identifying, understanding, prioritising and delivering the measures that will enable the Humber industrial cluster to significantly reduce emissions by 2030 and achieve net zero by 2040, while maximising strategic opportunities to drive the green recovery.

The Plan will enable a phased approach to be taken to decarbonisation – prioritising the implementation of near-term deliverable investments and mapping out how CCS and hydrogen infrastructure can be scaled up over time. It will consider how this can support cross-economy decarbonisation and local skills and supply chains.

Phase 1 of the Plan was led by the Humber LEP and CATCH. In Phase 2, eight leading industrial partners (British Steel, Centrica, Drax, Equinor, National Grid Ventures, Phillips 66, SSE and VPI Immingham) have joined the consortium. Extensive industry engagement will ensure wider stakeholders across the region are also involved.

The development of the Plan is part-funded by UKRI through the Industrial Strategy Challenge Fund. The Phase 2 project totals £2.6m and is expected to run from January 2021 to March 2023.

[8] https://www.yorkshirepost.co.uk/news/opinion/columnists/how-hull-and-humber-will-power-green-energy-revolution-kwasi-kwarteng-2932751
[9] https://www.humberlep.org/study-of-the-humber-energy-intensive-industries-cluster/

Two interlinked opportunities will be at the heart of the Humber Cluster Plan: fuel-switching and carbon capture and storage.

- **Fuel-switching:** Switching the power used by industrial processes from fossil fuels to clean energy sources with zero or net zero emissions – primarily electricity, blue or green hydrogen and biomass. The type of energy used will vary depending on the process.
- **Carbon Capture and Storage (CCS):** CCS prevents remaining emissions from entering the atmosphere by locking them underground, without ceasing (or displacing overseas) key industrial processes that the UK depends on. Phase 1 of the Humber Cluster Plan project found that 56% of the Humber's industrial combustion emissions are from internal fuels – unavoidable by-products of industrial processes – making industrial CCS an essential part of the region's approach.[10] CCS could also enable large-scale generation of blue hydrogen, supporting fuel-switching in industry and other sectors.

The Humber is attracting interest from world-leading energy, infrastructure and industrial businesses to deliver projects that respond to these opportunities. Announced projects in development include:

- Gigastack, a consortium of ITM Power, Ørsted, Phillips 66 and Element Energy working to demonstrate how renewable hydrogen derived from offshore wind can be used in industry
- Hydrogen 2 Humber Saltend, led by Equinor, a plan to develop one of the world's first at-scale facilities to produce hydrogen from natural gas in combination with CCS
- Zero Carbon Humber, a partnership of Drax, Equinor and National Grid Ventures exploring the development of BECCS, through creating the world's first carbon negative power station, and hydrogen production
- Humber Zero, a CCS and hydrogen production plan backed by VPI Immingham, Uniper and Phillips 66

The Government's commitment to providing funding for industrial energy transformation, hydrogen production, clean steel production and carbon capture and storage will support the delivery of projects such as these, subject to the future policy environment.

## Opportunities for expansion and diversification

The Humber's capabilities, including existing feedstocks, energy availability, skills and land for expansion at established industrial locations, underpin its potential to attract complementary new investment. For example, Ineos has announced plans to build a £150m Vinyl Acetate Monomer plant at its Saltend Chemicals Park site, bringing an important raw material back to the UK, and in 2020 bought the BP Chemicals business on the same site. Phillips 66 could anchor the development of an electric vehicle value chain, while proposed developments like the Yorkshire Energy Park would combine on-site power generation with new industrial users.

Industrial symbiosis, using the waste from one process as the raw material for another, is an opportunity to strengthen the Humber's industrial cluster whilst contributing to the development of a circular economy that

[10] HIDR Baseline Local Emissions Assessment (Element Energy, 2020)

supports clean growth. New income streams, such as from selling heat that is currently wasted, could support some plants to become more sustainable. Industry research found that potential symbiosis for industry in the Humber include[11]:

- hydrogen production
- upstream and downstream chemical intermediate manufacture
- use of waste such as dusts, tars, oils, effluent, sludges, ash and used filter media
- capture and sharing of excess heat, steam and chilled water

The transition to alternative fuels also brings potential for new manufacturing in the Humber cluster. Some, such as hydrogen and ammonia, are already used in some local industrial processes, meaning that there is existing expertise in safely transporting and storing them. Large-scale production of hydrogen is likely to be a core part of the Humber Cluster Plan, replacing fossil fuels in some high-energy, high-temperature processes. This capacity could also support the decarbonisation of other sectors, such as maritime and heavy goods transport, and neighbouring regions as the transport and storage infrastructure is developed.

The development $CO_2$ and hydrogen transport and storage infrastructure could become important assets for attracting new industrial investment to the region – with land available for growth alongside existing industrial locations on both banks of the Humber.

The processing of waste also continues to be an opportunity for the Humber. For example, Altalto, a collaboration of Velocys and British Airways, plans to develop Europe's first commercial scale waste to sustainable transport fuels plant near Immingham. Phillips 66 Humber Refinery has meanwhile developed projects to enable the processing of waste oils, converting these to high demand products, and the refinery continues to invest to expand this capability.

## Strengthening local skills and innovation

The Humber Energy Intensives Industries Cluster Study underlined the importance of strengthening the Humber's skills base to support the sectors to expand, while seeking to grow R&D activity in order to capture maximum value.[12]

Many businesses in the cluster are active in supporting the development of the Humber workforce, including through apprenticeships and involvement in local careers initiatives. Technical skills development is supported by the industry-led CATCH facility, the University of Hull, Institutes of Technology and colleges and training providers, which respond to business needs. However, some firms report difficulties in recruiting skilled managers and executives to the region, and awareness of career opportunities in the sector still needs to be improved.

[11] https://www.humberlep.org/study-of-the-humber-energy-intensive-industries-cluster/
[12] https://www.humberlep.org/wp-content/uploads/2019/06/Humber-Energy-Intensive-Industries.pdf

**Case study: CATCH**

The CATCH facility was set up via a partnership established in 1999 to support the multi-billion pound Humber Chemical sector, in a collaboration between businesses and the public sector. CATCH offers world leading facilities and works in partnership with multiple training providers including local further education colleges and private organisations who are recognised as leaders in their field – finding the solutions for businesses.

CATCH's membership is made up of partners from the process, energy and engineering sectors, their associated supply chains, and local authorities, including all four Humber local authorities. CATCH works collaboratively with the local authorities to attract inward and internal investment.

CATCH's latest expansion was completed in 2017, with new training facilities supported by a £1.75m investment through the Humber LEP's Growth Deal with Government.

The Humber has competed globally to secure substantial reinvestment in R&D from existing businesses, with recent successes including RB's new £105m Centre for Scientific Excellence and Smith & Nephew's medical devices R&D centre. By expanding the amount of R&D undertaken in these sectors, local partners in the Humber aim to increase the number of higher paid knowledge-intensive jobs, as well as position the region for future manufacturing activity through new product lines and processes.

# Clean energy generation

Energy is an essential foundation for economic growth. The UK is transitioning to clean sources of energy and the pace of change is set to accelerate. Over just a few years, the Humber has transformed into one of the world's leading hubs for clean energy. The Humber Energy Estuary has a vital role to play as the offshore wind sector scales up to deliver the Sector Deal and Government's commitment to the further expansion of offshore wind, and the opportunity to create more sustainable new jobs and business opportunities throughout the energy system.

The Humber Energy Estuary makes an important and diverse contribution to the UK's clean energy mix, including:

- manufacturing of blades, assembly and installation from Siemens Gamesa's facility at Greenport Hull; and operations and maintenance from the Port of Grimsby, with Ørsted, RWE, Centrica and E.ON amongst others. The Humber also has over 20 operational onshore wind farms;
- the Ports of Immingham and Hull import biomass for Drax power station near Selby, with Immingham capable of unloading 2,300 tonnes of biomass an hour. Drax is the UK's largest decarbonisation project, having converted four of its six units from coal to biomass;
- a third of the UK's gas is landed and processed at Easington by Gassco, Centrica and Perenco. The Humber is home to several gas-fired power plants including VPI Immingham, one of the largest Combined Heat and Power plants in Europe with the opportunity for blue hydrogen creation;
- Greenergy's Immingham plant fulfils a significant part of the UK's biodiesel requirement from waste and rapeseed oil;
- innovative energy from waste plants like Energy Works in Hull, and more facilities planned such as for the manufacture of aviation fuel; and
- underground storage sites for gases, both onshore and offshore; and growing interest in battery storage.

## Offshore wind cluster

The Government's target of 40GW of offshore wind by 2030, a fourfold increase on current installed capacity, along with industry's aim to increase UK content to 60% by the same date, present a significant opportunity.[13]

Offshore wind manufacturing, installation, operations and maintenance all now have firm foundations in the Humber, creating sustainable skilled jobs and attracting a wider supply chain. The Humber has more companies in the offshore renewables sector than anywhere else in the Northern Powerhouse and Scotland[14]. The Humber is centrally located for the largest offshore wind farms under construction and planned, and has the land, ports, and is continually developing the skills required to support the sector,

[13] Energy White Paper (December 2020)
[14] ORE Catapult and Technopolis analysis (2017) in Offshore Renewable Energy Science and Innovation Audit

meaning prospects are also strong. The industry-led Humber Offshore Wind Cluster Prospectus, launched in November 2020, set out the next steps for the cluster's growth.[15]

The UK's offshore wind Operations & Maintenance (O&M) sector is worth around £600m/year today and forecast to exceed £2bn by 2030. The UK has the potential to leverage its competitive advantage in offshore renewable O&M to develop UK solutions for a global market, and the Humber is positioned to be at the front of that drive.

The Humber ports are ideally situated for further installation activity, with the whole of the southern North Sea in easy reach. The location supports the Humber's position as a leading part of the UK's offer for attracting further manufacturing activity throughout the supply chain, having already secured one of the most significant manufacturing investments to date – Siemens Gamesa's blade factory in Hull, a £315m investment creating over 1,000 new jobs. Developments such as the Able Marine Energy Park would enable this to expand further, increasing UK content.

**Case Study: Green Port Hull / Siemens Gamesa**

Public-private investment of over £315m accelerated the employment of over 1,000 people, with over 95% living within a 30-mile radius of Hull. Around 10% of recruits were women, higher than in similar manufacturing and engineering environments where the proportion of female employees is typically below 5%.

Siemens Gamesa officially opened the wind turbine blade manufacturing plant in November 2016, ahead of programme and enabling the production of 75m wind turbines to support the growing offshore wind industry.

Through the Green Port Growth Programme, over 800 local businesses were provided with assistance to enter the renewables supply chain. Contracts exceeding £249m were awarded to businesses in the area as a result of the programme. The experience of the programme is now being used to help businesses access opportunities in other sectors as well, through the Supply Chain Network supported by the Humber LEP's Business Growth Hub.

Building on the Humber's leading capability in offshore wind operations and maintenance (O&M) is an immediate opportunity for securing high-value and sustainable growth. The Humber's O&M cluster is centred on the Port of Grimsby and includes Ørsted's expanding East Coast Hub employing over 360 people, RWE's bases for Triton Knoll and Humber Gateway, and a significant number of associated suppliers. It is supported by expertise in the wider Humber area, including Aura and the Offshore Renewable Energy Catapult, and helicopter operations from Humberside Airport. Local business networks such as Team Humber Marine Alliance and Grimsby Renewables Partnership continue to support SMEs to access opportunities in the sector, helping to build a local supply chain.

In the medium term, the Humber's role in blade manufacture and installation means that it is well-placed for repowering existing Round 1 and 2 turbines as well as Round 3 and 4 in the future, creating an opportunity to develop new industry in the Humber in the recycling and remanufacturing of old turbine equipment. This will require innovation in material separation as well as the development of new products from the

[15] https://www.humberoffshorewindcluster.co.uk/

materials. The Humber could be at the heart of an offshore turbine circular economy industry which by 2030 will see the need to decommission around 750MW of wind capacity and recycle more than 600 turbines each year – a huge economic opportunity.[16]

**Offshore Renewable Energy (ORE) Catapult: Smart O&M Centre**

The ORE Catapult has an ambitious plan to enable the UK to become internationally recognised as a centre for operating offshore renewable plant, and for UK innovators and solution providers to develop products and services that will build and maintain a UK based supply chain, boosting productivity of UK businesses, creating high value Intellectual Property (IP) and an exportable commodity.

In order to drive the levels of industry and supply chain engagement required to achieve its vision of a centre for global excellence, the ORE Catapult has decided to establish a major new presence at the Port of Grimsby, the UK's largest O&M hub.

This Smart O&M innovation centre will sit at the centre of a national ORE Catapult network based in other key O&M clusters, as well as strategic international relationships, to ensure that corridors of trade and knowledge exchange are optimised between clusters, resulting in national coverage with international influence.

The centre will ensure that the Humber becomes a globally significant cluster for the conception, research, development and commercialisation of the technologies and processes that will define 21st century O&M.

### *Innovation and skills*

Key to the future expansion of the Humber's offshore wind cluster and seizing the opportunities in the medium and long term will be developing and implementing the new technologies and skills required.

As turbines are located further out to sea, planned maintenance is increasingly likely to be carried out remotely – requiring expertise in robotics, sensors, communications and virtual and augmented reality amongst others. Wind farms in German and Taiwanese waters are already being supported from Grimsby; in future, technologies developed in the area could be used to monitor and maintain wind farms around the world. This could create new high-tech business and employment opportunities, building on the Humber's existing tech cluster, and could lead to new export markets for products and services.

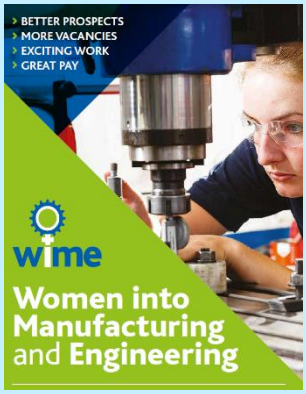
Aura, a partnership of the Universities of Hull, Sheffield and Durham; the Offshore Renewable Energy Catapult; and industry, aims to create a world-leading, multi-disciplinary offshore wind and low carbon energy innovation hub. The new Aura Innovation Centre at Humber Bridgehead will be a focal point for this work and will work with SMEs at any stage of the innovation process. The £5.5m Aura Centre for Doctoral Training will meanwhile create opportunities for over 70 post-graduate PhD students focusing on offshore wind and the environment. A £7.6m research partnership is already under way.

Investment in training facilities at the Humber's colleges, two university technical colleges and CATCH, home to specialist training providers including Maersk, as well as Siemens Gamesa's decision to relocate and expand its training centre in Hull, is supporting workforce development and local residents to access the new jobs being created. Providers are working in collaboration through the virtual Humber Energy

[16] https://www.energylivenews.com/2018/10/01/investing-e1bn-in-port-facilities-could-cut-offshore-wind-costs-by-5/

Skills Campus to respond to the industry's requirements, including encouraging greater diversity in the industry through programmes such as Women into Manufacturing and Engineering.

**Case study: Women into Manufacturing and Engineering (WiME)**




WiME is a business led programme designed to inspire girls and women to consider careers in manufacturing and engineering. The WiME Humber events have seen over 1,600 girls, parents, teachers and careers advisers attend. Airco, Siemens Gamesa and Swift Group started as the initial WiME Partners and partner numbers has now grown to 45 companies. The companies involved range from software, renewables, energy, chemicals, construction to ports & logistics and advanced manufacturing.

WiME has supported people into employment at companies including Airco, ABP, BP, Humber Bridge, Ideal Boilers, Ineos, Siemens Gamesa, Spencer Group and Swift Group.

## Diverse and secure energy supply

The Humber also makes vital contributions to other parts of the energy mix, supporting energy security and resilience, with the potential for further expansion:

- Nearby Drax, which imports some of its biomass through dedicated facilities at the Ports of Hull and Immingham, could become the world's first negative emissions power station using BECCS.
- The Humber's several gas-fired power stations provide a secure energy supply to industry and help to balance peaks in demand as well as the intermittency of some weather-dependent renewable generation. Several are already exploring decarbonisation through switching to hydrogen fuel or employing post-combustion capture, and new low-carbon thermal power generation could also be added. For example, SSE Thermal is developing an option for Keadby Three, a low-carbon combined cycle gas turbine (CCGT) plant alongside its existing power stations near Scunthorpe.

Investment is also being attracted in energy from waste facilities, including projects led by Spencer Group, Altalto, EPUKi, North Beck Energy and Solar 21.

As outlined earlier, the Humber is well placed to support the development of a hydrogen economy, with expected industry demand enabling existing production to be expanded with the help of carbon capture technology and deployment of electrolysis for green hydrogen using clean renewable power, creating a zero-carbon energy system. Increased availability of hydrogen would support industry, transport and domestic heat to transition to a clean fuel source. Similarly, the Humber also has potential to support the further use of ammonia as an energy vector.

Complementing this, the Humber has significant energy storage potential underground and under the North Sea, with depleted gas reservoirs, natural aquifers and salt caverns. Providing grid-scale battery storage close to offshore generation and mainland connection provides the opportunity to reduce short-term transmission losses.

The Humber also plays a vital part in the global battery supply chain, with the Phillips 66 Humber Refinery being the UK and Europe's only producer of petroleum graphite coke. This product is exported around the world at an industrial scale for the manufacture of electric vehicle batteries and consumer electronics.

The Humber's existing energy generation capabilities and variety of users, and the substantial interest in clean energy amongst local businesses, institutions and residents, makes it an ideal location for piloting new technologies and business models – whether on a large scale for industry, or a smaller scale for individual community use. The Humber Local Energy Strategy set out the first steps towards this, recognising the Humber's attractiveness for both on-site industrial power generation and community-level infrastructure that can lead to lower costs for businesses and consumers.

## Clean growth: next steps

**Our next steps towards achieving our priorities for clean growth are:**

1. To work in partnership with industry to develop an ambitious and deliverable Humber Cluster Plan by March 2023 and support the delivery of associated investments. This will include outlining the skills and supply chain opportunities for industrial decarbonisation, and establishing what arrangements will be required to deliver the plan.

2. To develop a shared proposition for further inward investment from energy and clean growth sectors, and consider how this will be marketed.

**Hull & East Yorkshire LEP and Greater Lincolnshire LEP will work with local authorities and other partners to support this by:**

1. Supporting the successful development of the Humber Cluster Plan (the Hull & East Yorkshire LEP will take over from the Humber LEP as the lead partner in the project).

2. Ensuring business and innovation support (including via Growth Hubs), careers advice (via Careers Hubs) and education and training provision is responsive to these opportunities.

3. Exploring opportunities for cross-economy decarbonisation and local energy developments (including through their Energy Hubs) that are complementary to the Humber Cluster Plan and associated low carbon infrastructure.

**We are seeking support from Government:**

1. To engage in the development of the Humber Cluster Plan and explore what further interventions may be required to expedite its delivery.

2. To progress the pipeline of projects that will be required to deliver the Humber Cluster Plan by 2040, and consider how opportunities for local residents and businesses can be maximised.

3. To support the development and marketing of the Humber proposition for inward investment in clean growth, via the Department for International Trade.

# Developing the Humber Ports and Manufacturing Clusters

## Our priorities

The Humber ports are vital to the UK economy. As well as supporting the energy sector and energy-intensive industries, they support a wide range of manufacturers in the Humber and across the UK, importing materials and components and exporting their products. Locally this includes a diverse mix of engineering and assembly sectors, such as in caravans and modular buildings, that will soon be joined by new rail sector manufacturing.

Our aim is to build on existing growth in the Humber ports and related manufacturing sectors to develop more value-added activity – creating new, skilled manufacturing jobs in the region – and support the wider Northern Powerhouse and Midlands Engine to trade internationally.

**Our shared priorities for the Humber ports and related manufacturing are:**

1. To increase the amount of value-added activity associated with the Humber ports, including through establishing a Humber Freeport to support the expansion of manufacturing in the region.
2. To establish the Humber as a clean maritime cluster, building on the region's contribution to decarbonising energy and industry.
3. To improve port connectivity and infrastructure, including rail and road access and enabling investment on port-related sites.
4. To enhance the Humber's competitiveness for logistics activity and support a greater share of UK trade, including through innovation in smart logistics and encouraging the implementation of efficient border arrangements following EU exit.
5. To support the productivity and competitiveness of port-related manufacturers, including by offering business, innovation and skills support that meets their needs.

## The Humber ports

**The Humber ports have long been at the heart of the region's economy. In the next stage of their transformation, they will enable the Humber's further development as a world-leader in clean growth, support it to become a globally competitive hub for sustainable shipping and logistics, and help the region to expand value-added manufacturing including through a Freeport. Intensifying and diversifying the Humber ports' economic role will strengthen the region's already pivotal contribution to the Northern Powerhouse, Midlands Engine and wider UK economy.**

The Government's Maritime 2050 strategy recognises that the UK economy is highly dependent on the maritime sector, with 95% of goods exports and imports moved by sea, including nearly half of the

country's food supplies and a quarter of its energy supply.[17] The UK's continued success as a global trading nation is dependent on its ability to import and export goods efficiently, and the Humber plays a vital role in supporting this.

The Humber ports are the UK's largest by tonnage, and the fifth largest in Europe. Together, Goole, Grimsby, Hull, Immingham and Killingholme handle over 40,000 shipping movements each year and 79 million tonnes of cargo[18]. The Humber has the UK's most inland port at Goole, and four ports on the River Trent (Flixborough Wharf, Grove Port, Gunness and Keadby), placing 75% of UK manufacturing and 40 million UK consumers within a 4-hour drive[19].

The Humber ports are strategically important to both the Northern Powerhouse and the Midlands Engine, forming their largest eastern gateway to international markets. The Humber ports and connected industries are also important to the regional economy, with the ports and logistics sector employing 25,000 people in the Humber in 2017 – an increase of nearly 50% since 2009 – contributing over £1bn to the Humber economy. Around 3,750 businesses operate in the ports and logistics sector, which has grown by 12% since 2010. Despite this growth, there are still productivity challenges. Sector productivity levels in the Humber (£74k GVA per FTE) are behind the wider Yorkshire and Humber region (£82k per FTE) and England (£111k GVA per FTE). As global trade volumes continue to increase, the sector in the Humber will need to respond to its productivity challenges in order to remain competitive and continue to support the wider regional economy.

With vessel sizes increasing, there is growing demand on ports to efficiently unload, handle and transfer cargo to ensure that shipping is as efficient as possible. Technological developments are facilitating this change and increasing efficiency, with digital systems being adopted by ports like Rotterdam to manage the transfer of cargo and enable customers to track their goods. The move towards autonomous vehicles and driverless technologies could also improve efficiency but is expected to have an impact on jobs and future skills requirements.

## Driving new value-added activity through a Humber Freeport

Efficient transport through the Humber ports supports manufacturing and other sectors in the UK and abroad, but the Humber's ambition is to add more value to the goods transported through its ports – creating new manufacturing jobs and supply chain opportunities in the local area. This builds on existing strengths and growth in port-related manufacturing sectors, described in more detail below.

To support this growth, the Humber will need to do more than offer the land and skills that are required in close proximity to the ports: it will need to be positioned to be globally competitive, recognising that overseas ports are also competing for new value-added investment to serve the European market. As part of this, businesses, local authorities and LEPs around the Humber have developed a plan for a Humber Freeport that would support the area to attract new value-added manufacturing growth on non-operational port land. The proposal will be submitted to Government in February 2021.

## EU exit

As one of the UK's major importing and exporting hubs, the Humber has a key role to play in maximising new shipping and trade opportunities that may emerge now the EU exit transition period has ended. With

[17] https://www.gov.uk/government/publications/maritime-2050-navigating-the-future
[18] ABP Data; (End Q3 2018)
[19] https://www.pwc.co.uk/who-we-are/regional-sites/yorkshire-north-east/insights/green-light-for-renewable-energy-in-the-humber-.html

the EU export market accounting for 44% of all UK exports in 2017, the UK's future trading relationship with the EU will be an important factor in the continuing success of the Humber's manufacturers, as well as the ports and services that support them.

ABP has invested £50 million to double container handling capacity in the Humber ports since the EU referendum, equipping them to play a crucial role in trade resilience.

The development of planned new border infrastructure at ports on both sides of the Humber will be essential for ensuring trade can continue efficiently with the minimum disruption.

## Port connectivity

The Department for Transport's Connectivity Study (2018) highlighted the importance of ports to global success and that their continuing performance relies on efficient and effective national, regional and local infrastructure.[20] Recent and ongoing infrastructure investment is supporting the Humber's vital role as an international gateway that is part of the land bridge between Ireland and continental Europe. Road access to the Port of Immingham was improved with Highways England's £97m upgrade of the A160 in 2017, while in Hull the £355m A63 Castle Street scheme began in March 2020 – following earlier work to deliver a new bridge at Princes Quay and improvements to Roger Millward Way. The Humber is also investing in local road infrastructure near ports to relieve congestion and open up new land for development.

Rail freight can reduce $CO_2$ emissions by up to 76% compared to road, as well as reduce congestion – with each freight train transporting the equivalent of 76 lorries.[21] Investment has taken place to enable larger containers to be transported by rail from the Port of Immingham, with the South Humber Gauge Enhancement scheme completed in 2019 supported by the Humber LEP's Growth Deal with Government. A similar scheme will also be required in the future to provide larger gauge clearance to the Port of Hull.

The Humber is connected to a network of inland waterways such as the Aire and Calder Navigation, connecting the Humber with central Leeds, which The Canal and Rivers Trust has identified as a priority waterway for development as a freight route – offering the potential for materials for large construction projects in the city centre to be brought in by low emission barge instead of road. Reinvigorating the use of inland waterways, such as for heavy cargoes that are less time-sensitive or large equipment and building components that are disruptive to transport by road, is a further opportunity for the Humber to support the decarbonisation of transport.

The Humber continues to work in partnership with Transport for the North and other city regions to develop the case for improving east/west connectivity from the Humber ports through to Liverpool. This would speed up Northern businesses' access to international markets and help the Northern Powerhouse to further grow its manufacturing and logistics clusters. Increased use of rail freight and inland waterways would also help to relieve pressure on the M62 and contribute to lowering carbon emissions across the North.

A key enabler of lower carbon freight transportation will be supporting intermodal transfer, such as from seagoing vessels to coastal shipping, barge or train. The strategic location of the Humber ports with

[20] https://www.gov.uk/government/publications/transport-connectivity-to-ports-review-of-the-current-status-and-future-infrastructure-recommendations
[21] http://www.rfg.org.uk/rail-freight/why-use-rail-freight/

multiple modes of transport in close proximity makes the area well suited to establishing new intermodal freight handling facilities.

## Clean maritime and decarbonisation

Through the Clean Maritime Plan, the Environment Route Map of Maritime 2050, the Government has set out its ambition for the UK to lead the way in transitioning to a future of zero emission shipping. The Humber can support the UK in this ambition by accelerating its transformation into a clean maritime cluster, building on its roles in renewable energy and decarbonising industry.

Key opportunities for the Humber include:

- The Humber is well placed to scale up supply of alternative fuels, such as hydrogen and ammonia, to the volumes required to support refuelling of ships, as well as trains and road vehicles. The Humber's established chemicals cluster is adjacent to its largest ports, and proposals for hydrogen production and distribution are being developed.
- The greater use of rail freight and inland waterways can help reduce emissions from road transport, reduce congestion and improve air quality to the benefit of local communities. This can be supported by the development of new intermodal freight handling facilities.
- The availability of electricity in the Humber, increasingly from clean sources, is a necessary enabler for installing the portside electricity infrastructure required to power – and in future potentially charge – vessels while in port, reducing emissions.
- The Humber's extensive port estate can host renewable energy generation as part of becoming greener. For example, ABP has installed solar panels on large warehouses across its port estate. The Port of Immingham installation alone totals 4.5MW, with electricity generated on site used to power port equipment such as cranes, conveyors and lock gates, and a small excess exported to the national grid.

# Logistics

## Rebalancing port trade flows

The Humber ports are the closest east coast ports to four of the five large-scale warehousing clusters in the North and the Midlands by journey times.[22] However, every year countless unnecessary road miles are driven by HGVs transporting goods to and from the North and the Midlands to ports in the South when closer Northern ports like the Humber could be a viable alternative.

Using Northern ports more appropriately could increase productivity in the logistics sector by reducing journey times, support the North to develop more value-added activity near its ports and help to cut the sector's emissions. Research by the University of Hull's Logistics Institute, supported by ABP, shows that across several key routes the Humber delivers on average a 15.3% better $CO_2e$ performance compared to southern port routes – with fewer road miles also enabling greater journey time predictability.[23]

[22] https://www.abports.co.uk/media/dbgh5u4c/mds-transmodal-report-the-proximity-of-the-gb-warehousing-stock-to-different-ports.pdf
[23] https://www.abports.co.uk/media/mmbffs2t/university-of-hull-logistics-institute-a-comparative-analysis-of-short-sea-import-and-export-routes-to-and-from-the-uk.pdf

Some progress is being made. Since 2017, the number of shipping services connecting Hull and Immingham to ports on the Continent has increased by over 30% with new services from Amsterdam and Ghent plus the introduction of deep-sea feeder services into the Port of Hull.[24]

The Humber's strategic location means that it is also well-positioned to benefit from changes in global freight transportation, including the increasing use of rail to transport containers overland to Europe from China along the Silk Road, bringing UK-bound containers directly into the north via either the northern European ports or the Baltic; and the opening up of alternative northern shipping routes

However, these opportunities for growth could also lead to increased congestion on the local road network, which is why transport investment – including in rail freight – remains essential.

## Smarter logistics

Large-scale infrastructure improvements are important but can be costly and time-consuming to deliver. Optimising existing infrastructure and introducing new smart technology ensures that maximum value can be extracted from new and existing assets.

Steps towards smarter logistics have already been taken, such as through the LHOFT project led by the University of Hull's Logistics Institute. In Hull, a new smart city platform is being established that will support the monitoring and optimisation of the city's road and other infrastructure.

**Case study: Liverpool - Humber Optimisation of Freight Transport (LHOFT)**

This unique project brings together the combined strength of a major cargo owner (Unilever), two key port operators at each end of the M62 corridor (ABP on the Humber and Peel Ports on the Mersey) to collaborate with experts from the rail industry in a study (led by the University of Hull's Logistics Institute) to develop an end-to-end journey model that promotes the diversion of trade from long distance North-South road routes to ports on the East and West of the country. These freight journeys could be further optimised using rail and offers the potential for a huge reduction in the number of freight miles on the UK road system. Technology to be developed by the University will enable multiple cargo owners to pool volumes to de-risk new sea and rail services through northern ports.

Delivery of associated projects such as the A63 Castle Street Improvement Scheme will unblock highway constraints between the Port of Hull and the National Strategic Road Network, supporting the long-term competitiveness of the Port of Hull and the East Hull and Paull Enterprise Zone sites that are needed to support the offshore wind industry and associated renewable energy manufacturing.

However, the Humber needs to do more to drive innovation in logistics. Overall, the Humber's logistics sector has been far less likely than the area's other strength sectors to undertake innovation projects.[25] The Humber's logistics sector is also skewed towards smaller independent operators, with only a limited local presence from the multinational third party logistics operators that have greater resources available to develop and deploy innovations and more influence over their customers and suppliers. The Humber will therefore need to ensure its logistics sector can access support to strengthen its competitiveness and is positioned to capture local value from increased throughput through the Humber ports.

[24] https://www.abports.co.uk/news-and-media/latest-news/2019/new-research-says-it-s-time-for-logistics-industry-to-think-humber/
[25] Hull University Business School analysis

The Humber's ambition is to become a testbed for trialling new ideas and technology that optimise the use of port infrastructure and related road and rail connectivity – enabling the region to become one of the smartest and most efficient port clusters in the world.  This will also support the Humber's ambition to reduce its carbon emissions by maximising transportation efficiency, and contribute to the region's work to strengthen wider maritime skills.

# Port-related manufacturing

The Humber ports enable a growing amount of manufacturing, processing, assembly and customisation activity to take place in the surrounding area, taking imported raw materials and components and adding value to them. In addition to energy-intensive and continuous process industries such as petrochemicals and steel, covered earlier, specialisms also include caravans and modular buildings, furniture and food processing.

The Humber's competitive advantage comes from the Humber ports providing easy access for importing materials and exporting finished products, large employment sites for the manufacture and storage of large products, and a good supply of relevant skills with high-quality training provision. The Humber Enterprise Zone has supported the expansion of this activity, with the manufacture of wind turbines at Greenport Hull and the planned assembly of London Underground trains by Siemens Mobility in Goole, and has the space to accommodate further growth.

## Engineering and assembly

The engineering and assembly sector contributed £1.5bn to the Humber economy in 2017, accounting for 8.2% of total GVA. There are 1,165 businesses operating in the sector, employing over 25,000 people – the third highest concentration in the Northern Powerhouse, and 50% more than in 2010. This growth has been supported by the strengthening of some specialisms, such as kitchen manufacture, as well as diversification into new products such as wind turbine blades.

Some sub-sectors are supported by embedded local supply chains, while the growing tech cluster in Hull is supporting digitalisation in the sector. However, there can be wide variation in the ability of businesses and availability of skills required to invest in the latest technology and process improvements to increase productivity and competitiveness, particularly as some sub-sectors contain many micro businesses.

The Humber's established business and skills base in these sectors, together with the availability of land in close proximity to the ports, mean that this is an area that could achieve further growth – potentially accelerated by the development of a Humber Freeport. In addition to offshore wind manufacturing, outlined earlier, two key growth opportunities are the rail sector and modular building.

### *Rail sector*

Siemens Mobility's decision to invest in an industry-leading £200m rail manufacturing base at the Goole 36 Enterprise Zone site is a major opportunity to step up the development of this growth sector in the Humber region, building on a long tradition for the sector in Yorkshire. Siemens Mobility plans to create up to 700 operational jobs and a further 250 during the construction period, with an additional 1,700 potential UK supply chain roles. The first phase of the manufacturing facilities is expected to open in 2023. It is anticipated the development will be fully operational in 2025. This will add to existing expertise in track manufacturing, loading and shunting equipment, operational communications and rail engineering, from companies including British Steel, Trainload, AD Comms and Spencer Group.

Supporting this, industrial partners and academic bodies including Siemens Mobility, the Universities of Birmingham and Hull representing the wider UK Rail Research and Innovation Network, and East Riding of Yorkshire Council are working to establish the Goole site as a hub for rail sector innovation and supply chain development. RaisE (Rail Innovation and Accelerator Solution Hub for Enterprise) will be a world-class centre for innovation, research and development – accelerating the adoption of technology within the rail industry, and providing a high-tech and well-equipped facility for start-ups and SMEs linked to rail

supply chains. Construction is under way in 2021, supported by investment from the European Regional Development Fund and the Getting Building Fund through the Humber LEP.

### *Modular building and modern methods of construction*

The Humber's cluster of caravan and modular building businesses, which currently caters mainly to the leisure and commercial development markets, has the potential to diversify into the residential market – supporting the Humber to deliver its housing targets, and creating an opportunity to win business elsewhere as part of wider moves to modern methods of construction.

Some small-scale projects have already taken place: Premier Modular worked with the Goodwin Development Trust to develop five houses on Hull's Thornton Estate, the city's first Code-5 sustainable social housing; while Integra manufactured modular apartments for a pilot project in Bristol.

The sector is continually improving the energy and resource efficiency of its products, meaning that it is aligned to the Humber's ambition to reduce carbon emissions to net zero.

**Delivering Low Carbon Homes through Energy Saving Retrofit**

The Humber is also addressing carbon reduction through development of retrofitting programmes that will ensure homes are able to support the carbon neutrality goals of the Humber Estuary Plan. In Hull, external solid wall programmes are helping to reduce fuel poverty, increase thermal efficiency and improve quality of life.

Over 800 homes so far have been provided with a range of energy saving works including full central heating systems, boiler replacements, roof improvements and external wall insulation that will save over 36,000 tonnes of carbon.

Council, social and privately owned homes ranged from traditional single skin brick construction, Victorian terraces to those that have previously been earmarked for demolition because of structural defects. Projects also addressed structural stability of previously unmortgageable homes and defective houses to allow mortgages to be raised on the properties.

## Ports and manufacturing: next steps

**Our next steps towards achieving our priorities for ports and manufacturing are:**

1. Submitting an ambitious bid for a Humber Freeport to Government in February 2021.

**Hull & East Yorkshire LEP and Greater Lincolnshire LEP will work with local authorities and other partners to support this by:**

1. Advocating and seeking funding for infrastructure improvements that will support the competitiveness of the Humber ports and manufacturing clusters.
2. Working in partnership with industry and academic partners to maximise the opportunity presented by the development of the Siemens Mobility rail manufacturing facility, seeking to establish the Humber as a key location for rail sector innovation and supply chain growth.
3. Ensuring business support (including via Growth Hubs), careers advice (via Careers Hubs) and training provision is responsive to these opportunities.

**We are seeking support from Government:**

1. To back our proposal for a Humber Freeport and work with us to implement it.
2. To provide commitment to improving trans-Pennine freight links, particularly by rail and water, that will support the decarbonisation of the logistics sector.
3. To support the development and marketing of the Humber proposition for inward investment in port-related manufacturing and the more efficient use of northern port assets, via the Department for International Trade.

# Managing the Humber Estuary asset

## Our priorities

The Humber Estuary is a unifying natural and economic asset on which a significant part of the Humber's economy depends, as well as being a contributor to wider UK prosperity. Its diverse natural resources are internationally recognised for their importance, but rising sea levels mean that flooding from the Humber Estuary presents a growing risk for the communities and industries that surround it.

As a shared resource, the Humber Estuary must be managed responsibly and collectively by the many different stakeholders involved.

**Our shared priorities for managing the Humber Estuary asset are:**

1. Alleviating the risk of flooding to communities and industries around the Humber Estuary, with a focus on developing and delivering the Humber 2100+ Strategy.
2. Jointly managing and investing in the Humber Estuary's unique natural resources.
3. Facilitating new economic development in a timely and sensitive manner, working with agencies and stakeholders to manage the trade-offs involved in a transparent way.

## Flood risk and living with water

The Humber has the second highest flood risk in the country, behind only the Thames Estuary. Between 1993 and 2015 sea levels increased by up to 2mm per year, having a significant impact on the Humber region due to its topography. There are currently 90,000 hectares (ha) of land around the Humber Estuary at risk of being flooded, and around 400,000 people, mostly around Hull and Grimsby. The impact of the 2007 floods in Yorkshire and the Humber had a total economic burden of £2.7bn, or 4 per cent of the region's GVA, and it took the region's economy 14 months to recover. The 2013 Tidal Surge in the Humber was also extremely disruptive to the area's economy, with damage to 115 businesses and 149 residential properties recorded in Hull, for instance.

As well as the direct disruption to businesses and residents, flood events can deter reinvestment and new investors coming to an area. Recognising this, a range of partners in the Humber are contributing to improved flood defences that are ensuring the region remains open for business. By the end of 2021 over £150m will have been invested in flood defence improvements as a result of the current Humber Strategy, better protecting 70,000 properties. Investment has come from a range of sources, including Government grants, European Regional Development Fund and businesses.

The Environment Agency is working in partnership with 12 local authorities and the Humber LEP to develop a new Humber Flood Risk Management Strategy, which will redefine the strategic approach to managing tidal risk for the next 100 years. It is currently due to be submitted for approval by the end of 2021. The

Humber Strategy will consider the needs of the environment as part of the delivery of flood management and will use opportunities to use natural flood management to increase the region's resilience.

The Living with Water Partnership has brought together Hull City Council, East Riding of Yorkshire Council, the Environment Agency and Yorkshire Water to ensure a strategic joined up approach to effective flood management is taken. Part of this is encouraging behavioural change for businesses and residents of the area. The success of this work led to the partnership winning the 2019 BQF award for Public/Private Sector collaboration.

**Living with Water Partnership: Flood Protection**

The Living with Water partnership comprises the Environment Agency, Hull City Council, the East Riding of Yorkshire Council and Yorkshire Water with a vision of becoming a sustainable city, protected from climate change with a thriving 21st Century economy predicated on the relationship with water in the city and surrounding areas.

Whilst waterside living is seen as an attraction, the risk of flooding is something that needs addressing through good design. The flood risk that the city faces means that significant work over the past decades has gone into understanding the risk and providing the necessary infrastructure. Considerable investment has and is going into flood alleviation on the River Hull, Humber and surface water and sewer flooding.

Living with Water has successfully drawn the public and private sector interests in water together to deliver long-term investment into flood infrastructure within Hull and the East Riding. Since its formation, the partnership has delivered £200m of investment into flood infrastructure including the construction of new flood defences along the River Hull and Humber, a new pumping station at Kingswood, construction of 3 large flood storage areas on the city's boundaries and the creation of 6 smaller storage areas within the city. All these measures led to Hull being awarded the status of a Global Water Resilient City in 2018.

A group of local businesses has meanwhile funded the development of a concept for a lagoon in the Humber. The ambitious project would also create a new road link and development land.

The University of Hull conducts nationally significant flood management research and is progressing the development of a Flood Resilience Centre of Excellence to develop and disseminate this research. It has also recently established the Flood Resilience Innovation Centre following a successful bid for £1.9m from the European Regional Development Fund. The centre will enable Humber-based small and medium sized enterprises to develop innovative solutions to mitigate flood risk, improve response to flood events and increase resilience. Project Ark, set out below, would take this ambition further.

The expertise of local authorities, the University of Hull and Yorkshire Water allied to the responses to past flooding events mean the Humber is in a strong position to develop the next phase of water management approaches for the UK, which can inform future development.

**Case study: Ark – National Flood Resilience Centre**

Humberside Fire and Rescue Service and the University of Hull have come together to create Ark: the National Flood Resilience Centre. Ark will make the UK a world leader in flood rescue, research and resilience by creating a unique, purpose-built facility for training, research and innovation.

Combining simulated full-scale urban and rural environments that can be inundated, Ark will provide flood emergency responders with safe and realistic training in swift and still water. Ark will also act as a hub for new undergraduate and postgraduate Engineering programmes at the University of Hull and provide unique experimental facilities to support research and innovation, with capabilities that cannot be replicated at any existing research establishment.

# Natural capital

The Humber is recognised as being rich in natural capital. Most of the Estuary is designated as a Ramsar site and as a Special Area of Conservation for its extensive intertidal habitats such as mudflats, sands, coastal lagoons and sand dunes, and its populations of grey seals and lampreys. It is also a Special Protection Area for its breeding, migratory and overwintering bird populations, the third largest Site of Special Scientific Interest in England, and home to three National Nature Reserves.

The Humber's natural capital makes an important economic contribution through employment in agriculture and food processing; attracting tourists to areas such as Flamborough Head and Spurn Point; helping to retain the Humber's deep-water channels essential to shipping; saltmarsh acting as a natural buffer to tidal flooding; and the rivers and aquifers providing water for farming and other industries. It is also a key part of the area being attractive to live and work in and supports the health of residents and workers with green space, fresh air and access to wild places offering great opportunities for exercise and recreation.

The Humber's natural capital will play a vital role in helping the area achieve net zero carbon emissions and increase resilience to the impacts of climate change. The Estuary's ecosystems, distinctive saltmarsh, reedbeds, mudflats and coastal marine sediments capture $CO_2$ and provide effective flood management.

A systemic, large-scale intervention in the land use management across the Humber could yield significant natural carbon sequestration, while enhancing flood resilience and establishing a self-sustaining environment.

Initial estimates are that existing natural habitats (25% of land cover) around the Humber sequester around 0.6Mt$CO_2$e/yr. Changes to land management use, such as increasing wetland area within the flood risk zone, which has the added benefit of additional flood storage capacity, and restoring peatland, could increase this by 2MtCO2e/yr – approximately 21% of the current carbon footprint of the Humber area.

Because the Humber's natural capital matters, it needs to be managed and invested in like any other form of capital. In particular, the Humber Estuary and its related landscape need to be managed as one, supporting the area's industrial ambitions and protecting and improving this important finite resource.

The Humber aims to develop an ambitious joint approach to managing and investing in the natural capital of the Humber Estuary, building on the strong local partnerships that are already in place and a track record of delivering successful natural capital projects.

**Case Study: Cress Marsh Mitigation Site, South Humber Industrial Investment Programme**

The South Humber Industrial Investment Programme (SHIIP) is the largest economic regeneration initiative ever delivered by North East Lincolnshire Council and its regeneration partner ENGIE. The £42m programme, funded by the Council and both the Humber and Greater Lincolnshire LEPs, is tackling a long-term market failure in the provision of high-quality employment sites and premises on the South Humber Bank.

SHIIP is providing enabling infrastructure to unlock delivery of the Stallingborough Interchange Enterprise Zone (EZ) site and supporting a first phase of advanced industrial units on the site; bringing forward a new £8.4m link road connecting the Ports of Grimsby and Immingham and improving access to adjoining EZ sites; and delivering a comprehensive programme of ecological mitigation to de-risk future development of the area.

Working with ecological organisations like the RSPB and Natural England, the Council developed a unique and innovative mitigation strategy. Creating wetland mitigation sites in advance will allow industrial developers to meet their environmental planning conditions without costly up-front investment. The first of these sites, Cress Marsh, was completed in December 2018.

## Responding to development proposals

The Single Conversation approach, established by the Humber LEP as part of the Hull & Humber City Deal in 2013, has been a trailblazer in simplifying liaison between organisations on major developments – making the area more responsive to time-sensitive proposals. It brings together senior representatives of the four Humber local authorities and a range of statutory agencies and utilities companies involved in planning and development to address major projects and developments across the region, with the purpose of working collaboratively to overcome challenges and barriers to delivery and ensuring that these projects can contribute to the economic development of the Humber area.

A 2020 review of the group's work found that a diverse range of projects and developments have been addressed across the region, covering transport infrastructure, flood defences and new commercial and industrial developments. Notable examples include the time-sensitive Tetney pipeline replacement and the development of Greenport Hull. Feedback from both developers/investors and participants highlighted the strength of a unique initiative that helps the Humber stand out.

Continuing the Single Conversation approach will enable the Humber to remain responsive to inward investor interest and capable of delivering on time-sensitive development and infrastructure projects. Complementing the proactive approach being taken to managing and improving the Humber Estuary's natural capital, this will also ensure trade-offs can be dealt with in a transparent way.

## Managing the Humber Estuary asset: next steps

**Our next steps towards achieving our priorities for managing the Humber Estuary asset are:**

1. Designing an integrated Local Natural Capital Plan for the Humber Estuary, which will incorporate the value of natural capital in support of other carbon sequestration activities; and identify the best places to invest in improving the area's unique environment to support productivity, growth, and wellbeing. The Humber will engage with Defra and – building on the existing collaboration – the Environment Agency and Natural England to develop a joint plan through an inclusive process involving wider partners.

2. Continuing the proven Single Conversation approach established by the Humber LEP to support the area to be responsive to major development proposals that may affect the Humber Estuary environment.

**Hull & East Yorkshire LEP and Greater Lincolnshire LEP will work with local authorities and other partners to support this by:**

1. Recognising the economic and environmental importance of the Humber Estuary in their economic strategies.

2. Advocating and seeking funding for improvements to flood defences and natural capital that will support communities around the Humber Estuary.

**We are seeking support from Government:**

1. To continue to support the development of the new Humber 2100+ Flood Risk Management Strategy as planned (ahead of approval during 2022 and launch in 2023), and committing to recognising the strategic national importance of the Humber's economic and environmental assets when considering the investment required to deliver it.

# Attracting and delivering new investment

## Our priorities

The opportunities outlined in this plan have the potential to attract new inward investment to the Humber, creating jobs and supply chain opportunities for communities around the Estuary. Developing and marketing the Humber's shared proposition, and responding proactively to opportunities, will ensure the region maximises this potential.

**Our shared priorities for attracting and delivering new investment are:**

1. To develop and market the shared proposition for investment in the Humber allied to this plan.
2. To respond proactively to investment opportunities, collaborating across boundaries where relevant.

## The Humber offer

The Humber is recognised across the UK and around the world for its ports, energy and industrial clusters. It also benefits from its association with the Yorkshire and Lincolnshire brands, known for quality of life, and the distinctive identities of its city and towns.

The shared opportunities outlined in this plan in clean growth, ports and port-related manufacturing give the Humber a compelling offer for new trade and investment, supported by local supply chains, skills, connectivity and development land. New low carbon infrastructure, such as hydrogen and $CO_2$ pipelines, and the potential development of a Humber Freeport will bolster the region's competitiveness.

The complementary offers of the places around the Humber for these opportunities mean that the Humber's strongest proposition is a joint one, covering the assets and capabilities on both sides of the Humber Estuary and a varied portfolio of sites and premises. From city centre office accommodation to innovation centres, port-side industrial land to pre-built manufacturing premises on the edge of towns, the Humber has a diverse offer that can suit many requirements.

Working together to develop and market this proposition, and responding proactively to investment opportunities, will help ensure the Humber maximises its potential. In doing this, the Humber can draw on the experience and capabilities of its four local authorities and two LEPs to deliver on major opportunities; the support of businesses and Marketing Humber to communicate them; and the role of the Department for International Trade to market the UK around the world.

## Attracting and delivering new investment: next steps

**Our next steps towards achieving our priorities for attracting and delivering new investment are:**

1. To develop investment propositions for the areas outlined in this plan.
2. To work with partners to develop and deliver a marketing strategy for the investment propositions.

**Hull & East Yorkshire LEP and Greater Lincolnshire LEP will work with local authorities and other partners to support this by:**

1. Agreeing and incorporating shared Humber messages into their marketing and communications.
2. Continuing to respond proactively to investment opportunities, collaborating across boundaries where relevant.

**We are seeking support from Government:**

1. To support the development and marketing of the Humber proposition for inward investment via the Department for International Trade.

# Wider priorities for growth and productivity

This plan has set out how the agreed shared priorities for collaboration across the Humber Estuary will be taken forward by the Humber Leadership Board, supported by LEPs, local authorities and any future combined authorities.

Wider action on the five foundations of productivity set out in the UK Industrial Strategy – Ideas (innovation), People, Infrastructure, Business Environment and Places – will be crucial for supporting these shared priorities, and ensuring that their delivery has the maximum benefits for local communities. This includes support to carry out research and commercialise new ideas; providing training facilities and programmes that meet the needs of the area and supporting people into work; investing in infrastructure that enables development and supports people to access employment; and ensuring local businesses and new investors can access the advice and support they need to grow in this region. Providing this will ensure places across the Humber region benefit from the opportunities outlined here and in local strategies.

As, at the time of writing, the economic impact of the Covid-19 pandemic continues to be felt, action to support businesses and residents through the effects and aftereffects of the recession it has caused will also be essential. The priorities set out in this plan, as well as wider action on the foundations of productivity, will aid the region's economic recovery.

The Hull & East Yorkshire and Greater Lincolnshire LEPs will set out revised long-term economic strategies for their areas in due course, complementing shorter-term local recovery planning. These will reflect the shared Humber Estuary priorities outlined in this plan, as well as opportunities and issues distinctive to their areas and actions they will lead on the foundations of productivity.