



Economic Impact Study of Ørsted Investments in the Humber region

A Report for Ørsted UK

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1 Executive Summary

Ørsted is among the world's leading renewable energy companies. Over the last decade, the East Coast has grown to become one of Ørsted's major areas of development in the UK. Beginning their activities at the Port of Grimsby in 2012 with a small base and associated infrastructure for the Westernmost Rough offshore wind farm, they since opened their expanded East Coast Hub in 2019, now the world's largest offshore wind operations and maintenance centre. The Hub currently supports the six East Coast offshore wind farms developed and acquired by Ørsted over the last decade (Westernmost Rough, Lincs, Race Bank, Gunfleet Sands, and Hornsea 1&2.); over the next decade, it will deliver two more. Combined, the existing and future wind farm developments create a capacity of 8.6GW, contributing 17% of the UK government's 2030 ambition of 50GW of offshore wind.

This study quantifies the economic impact of Ørsted-led investments in the Humber region over the last decade and forecast to 2030. Using best practice methodologies, it assesses the effect of the offshore wind farms and associated investments in the Humber on the local employment and business environment, the diffusion of activity through supply chains, and the induced effect of this activity on the wider economy.

Through employment and training opportunities, wind energy in the Humber has transformed the shape of work in the region, engaging local people in a fast-growing and dynamic industry. It has provided new skills and sustainable jobs in a coastal economy, boosting production and providing a source of regional prosperity for decades to come. Through direct investment in local education, and training opportunities in the company, Ørsted is providing a route for local young people to enter one of the world's most dynamic and growing industries.

1.1 Economic Impact Results

Ørsted has directly invested or enabled investment of **£9.5 billion** (Westernmost Rough, Race Bank, Hornsea 1 and Hornsea 2) in infrastructure and assets within proximity of the Humber region and its coast. Over the next decade, further investments will add another **£14 billion** in this region.

We have modelled this investment to demonstrate the Gross Value Added (GVA) – a measure of productivity – which this investment has contributed to the economy.

The total national economic impact of the investments is **£2.2 billion GVA** over the two decades of offshore wind investment in the Humber. This is made up of £982 million GVA over the past decade, and a further 1.22 billion GVA to 2030.

The effect of this investment generates economic activity through Ørsted's supply chain across the country, in construction work required to build the wind farms in the Humber, and induced jobs across the UK as a result of the increased spending.

Further Ørsted development will **sustain at least 760 FTE jobs in supply chain companies** around the UK, **7,500 in construction roles**, and **1,100 roles across the broader economy**.

1.2 Regional GVA and Employment

Ørsted's investments have made a major contribution to the regional economy.:

- Ørsted has contributed **£816 million GVA to the Humber economy** over the past decade. Ørsted's presence and further investment in the Humber will deliver a **further £960 million** to the Humber economy in the period to 2030. This totals more than **£1.7 billion GVA**.
- Of the above, it is estimated that more than **£45 million** has been invested directly into local community, education and skills development in the Humber region to date, such as the £1m donation to the Grimsby Youth Zone, with significant further investments planned.
- The East Coast Hub is Ørsted's home for the long-term operations and maintenance of their operational East Coast offshore wind farms. There are **520 people currently employed at the East Coast Hub** in the Humber, 230 directly employed by Ørsted and the remaining being long term operations and maintenance contractors. Since 2017, **21 apprentices** have been trained at the East Coast Hub, and 20% of these are female. Over the next decade, more than **80 new apprentices** will be created across a range of technical and non-technical roles.
- Over the period to 2030, the number of people working out of the East Coast Hub will **increase to over 800**, adding 250 high-value jobs in the green economy.

1.3 Carbon Abatement

The offshore wind investments off the Humber coast have a major role to play in the UK's journey towards net-zero emissions:

- By 2030, investment here will generate enough electricity **equivalent to at least one in four homes in the UK** powered by Ørsted from assets off the Humber.
- Ørsted's investments in the Humber region to date have led to **3 million tonnes of CO₂ abatement**. In the period through to 2030, there will be a **further 21 million tonnes of avoided** emissions.
- The combined value of this CO₂ abatement to the UK economy is estimated at **£6.8 billion**.

Contents

1	EXECUTIVE SUMMARY	2
1.1	ECONOMIC IMPACT RESULTS	2
1.2	REGIONAL GVA AND EMPLOYMENT	3
1.3	CARBON ABATEMENT	3
2	INTRODUCTION	6
3	METHODOLOGY	8
3.1	APPROACH TO THE STUDY	8
3.2	IMPACTS	12
3.3	CARBON ABATEMENT	16
4	ECONOMIC IMPACT RESULTS	18
4.1	ECONOMIC IMPACT	18
4.2	REGIONAL GVA AND EMPLOYMENT	18
4.3	CARBON ABATEMENT	19
5	CASE STUDIES: INSPIRING PEOPLE	21
5.1	BRIDIE SALMON – APPRENTICE WIND TURBINE TECHNICIAN	21
5.2	KYRAN ARAVINTHAN – APPRENTICE WIND TURBINE TECHNICIAN	22
5.3	JASON LEDDEN – SENIOR CONSTRUCTION PROJECT MANAGER	24
5.4	LIAM JACKSON – SENIOR PROJECT AND CONTRACT MANAGER	26
6	CASE STUDIES: SUPPLY CHAIN EXCELLENCE	28
6.1	AMS No-DIG	28
6.2	BGB SCAFFOLDING	30
6.3	HUTCHINSON ENGINEERING	31
6.4	PICT OFFSHORE	32
6.5	SIEMENS GAMESA RENEWABLE ENERGY	33
6.6	SPECIALIST MARINE CONSULTANTS LIMITED	35



Hornsea 1 Offshore Wind farm

2 Introduction

Ørsted is among the world's leading renewable energy companies. Formed as DONG Energy in 2006 following the merger of six Danish energy companies, Ørsted's heritage lies within Danish energy production. Their developments across a range of green energy solutions are helping to decarbonise the world's energy systems, limiting global warming, and providing clean, renewable energy in the UK.

Ørsted has been on a green transformation journey for fifteen years and in this time have established the company as a global leader in offshore wind. In 2017 Ørsted divested its upstream oil & gas business operations and rebranded to Ørsted. Ørsted has 7.5 GW of constructed capacity and the ambition to increase this to 15 GW by 2025. The UK, home to the world's largest offshore wind farms, is at the centre of Ørsted's plans. Ørsted has 12 operational offshore wind farms that it either owns or partly owns, one wind farm under construction and a further three in its development pipeline.

Over the last decade, the East Coast has grown to become one of Ørsted's major areas of development in the UK. Beginning their activities at the Port of Grimsby in 2012 with a small base and associated infrastructure for the Westernmost Rough offshore wind farm, they since opened their expanded East Coast Hub in 2019, now the world's largest offshore wind operations and maintenance centre. The Hub is currently supporting five offshore wind farms, including Westernmost Rough, Lincs, Race Bank, Gunfleet Sands, and Hornsea 1. Hornsea 2, currently under construction, will be joining the East Coast portfolio in mid-2022. By 2030, Ørsted will develop two additional large wind farms, Hornsea 3 and Hornsea 4, increasing the energy-creating capacity off the coast of the Humber still further.

Ørsted has commissioned Opergy and Metro Dynamics to assess the economic impact of these two decades of offshore wind investment in the Humber.

Starting with the development of the Lincs wind farm, which became operational in 2013, Ørsted's investments in offshore wind have generated economic benefits, both locally and nationally, and this will continue over the next decade.

This Economic Impact Study focuses on Ørsted led investments in the Humber region over the last decade and forecast to 2030. Using best practice methodologies, it assesses the effect of the wind farms and associated investments in the Humber on the local

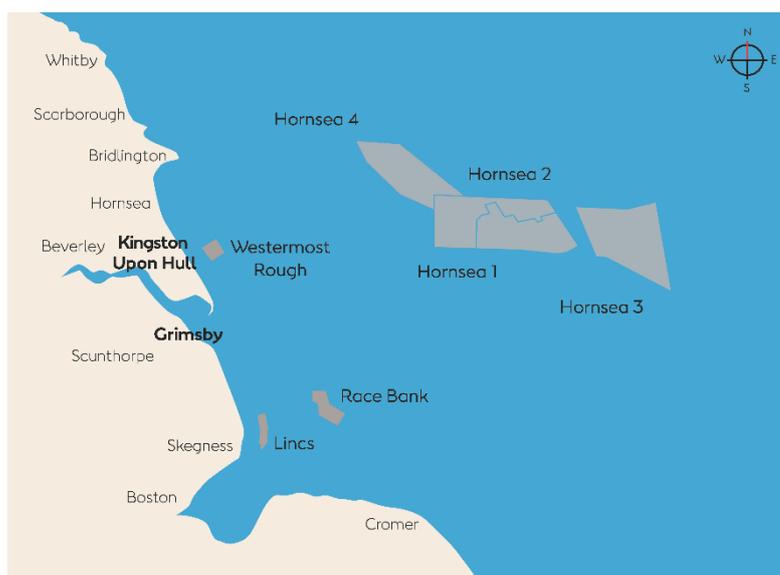


Figure 1 – Ørsted's East Coast Offshore Wind projects

employment and business environment, the diffusion of activity through supply chains, and the induced effect of this activity on the wider economy.

These are supported by case studies of how Ørsted's involvement in the Humber has transformed the local economy. Through employment and training opportunities, wind energy in the Humber has transformed the shape of work in the Humber, engaging local people in a fast-growing and dynamic industry. The supply chains for these offshore wind farms reach across the country, adding new specialisms in the local area and supporting firms outside of it.

The offshore wind farms off the Humber Coast have added and will continue to add significant new capacity to generate clean and renewable energy in the UK. This represents value to the UK and to the natural environment, offering an alternative to fossil fuel power stations and supporting the UK's strategy for net-zero. As such, it has a value to the UK. Accordingly, it has been modelled below in terms of its economic value, demonstrating its importance to the UK in easily comparable economic terms in line with established appraisal methods.



Figure 2 - Ørsted's East Coast Hub located at the Port of Grimsby

3 Methodology

The methodology of this Economic Impact Assessment (EIA) is based upon nationally agreed economic appraisal methods set out in HM Treasury's 'Green Book'¹. It draws on a range of studies and data that relate to the existing and planned Ørsted investments in the Humber, as well as broader economic data to calculate impacts where needed.

This analysis incorporates:

- a) The economic impact of the Ørsted investments in the Humber to date, beginning in 2012/13.
- b) The projected economic impact of Ørsted's planned investment in the Humber to 2030.
- c) The impact of the carbon dioxide emissions abated through the provision of clean energy through Ørsted's investments. This is represented as an economic value, in line with government appraisal approaches.

We have modelled the economic and climate impact at two geographic levels:

1. At a regional level, corresponding to the Humber area, comprising the local authority areas of: Kingston upon Hull, the East Riding, North Lincolnshire, and North East Lincolnshire.
2. At a national level (UK) – corresponding to all other parts of the UK apart from the Humber region, acknowledging that some of the economic benefits of Ørsted's investments in the Humber impact other parts of the country.

3.1 Approach to the study

The EIA is based on data provided by Ørsted, which covers their investments off the East Coast and in the Humber region. This incorporates operations information from the East Coast Hub, spend in the local supply chain, and donations and investments in facilities and training in the local area. We have modelled the economic impact of this activity to demonstrate the additional growth attributable to Ørsted's involvement in the Humber. This is expressed as additional Gross Value Added (GVA) – a measure of productivity used to quantify the size of different parts of the economy.

This study covers the investments made over the last decade and likely future development through to 2030. To date, Ørsted has invested in six offshore wind farms off the East Coast (five through development, and one through acquisition) and within a proximity to the Humber, significantly increasing the UK's capacity to generate clean, renewable energy. These offshore wind farms are Westermost Rough, Race Bank, Gunfleet Sands, Hornsea 1 and Hornsea 2. Lincs offshore wind farm was acquired by Ørsted from Centrica. Over the next decade, Ørsted will invest in their Hornsea 3 and Hornsea 4 wind farms.

¹ [The Green Book: appraisal and evaluation in central government](#). HM Treasury, 2022.

This investment is summarised in table 1: Ørsted has directly invested or enabled investment of **£9.5 billion** (Westermost Rough, Race Bank, Hornsea 1 and Hornsea 2) in infrastructure and assets off the coast of the Humber. Over the next decade, further investments will add another **£14 billion** (Hornsea 3 and Hornsea 4).

Project	% Ørsted share <i>(at point of investment decision)</i>
Westermost Rough	50%
Lincs Wind Farm Ltd ²	0% ³
Race Bank Wind Farm Ltd	100%
Gunfleet Sands Ltd	50%
Hornsea 1	100%
Hornsea 2	100%
PROJECT INVESTMENT TO DATE	£9.5 billion³
Hornsea 3	100%
Hornsea 4	100%
FUTURE PROJECT INVESTMENT	£14 billion⁴

Table 1 - Summary of Investments in Offshore Wind farms off the Humber coast, stimulated by Ørsted

Ørsted's role in supporting decarbonisation in the Humber – the highest carbon emitting UK region - goes beyond offshore wind, including the exploration of green hydrogen production and supply through projects such as Gigastack⁵, a joint-venture project with ITM Power, in which they are developing new electrolyser manufacturing infrastructure, prototyping a 5MW electrolyser stack and delivering a major FEED study for a 20 MW+ deployment at Phillips 66's Humber Refinery, powered by Ørsted's Hornsea 2 offshore wind farm. Phases 1 and 2 of the project have been delivered, with support from the UK Government. The Gigastack consortium has identified a pathway to a final investment decision by Q2 2023 and a commercial operating date by the end of 2025.

To model the impact of these investments, we have deconstructed Ørsted's activity to measure the additional employment, spending and educational provision it has generated in the Humber. Several of these have knock-on effects in the wider economy, which also generate economic benefits, described in more detail below. Providing each of these

² Lincs has been excluded from the data as it was purchased from Centrica.

³ Figures include/ exclude:

- Aggregated total for all the East Coast wind farms (Ørsted share where partners contributed to construction costs).
- Capex for full construction cost of the wind farm. It excludes Devex. It excludes Opex.
- It includes the cost of the OFTO even if this is subsequently divested (based on the transfer value as a proxy).
- The figures are from our Ørsted internal accounts that provide the data for their published Annual Report. Original data is in DKK and converted to GBP using an average conversion rate for the year.
- Where a partner contributed during the construction phase, the figures relate to Ørsted-share only.

⁴ Assume cost per MW for an existing Ørsted wind farm, applying assumed cost reduction factors.

⁵ Project Gigastack – A Joint Venture between ITM Power, Ørsted, Phillip 66, and Element Energy [Gigastack - Demonstrating renewable hydrogen for a net zero future](#)

additional benefits with an appropriate GVA multiplier based on established ready reckoners, their combination provides the total overall impact of the investment for the UK economy.

To model past impacts on the economy, we have used Ørsted's operational data covering their direct employment, their supply chain spend, their skills and training provision, and their contributions through donations to the local economy. To model future impacts, we have made projections by uplifting past trends in line with the confirmed increase in Ørsted investment over the next decade. Our assumptions are based on previous patterns in workforce growth and the effect of new investments on the supply chain and in the wider economy.

The combined economic impact of the Ørsted investments is made up of this impact to date and the projected future impact. The GVA uplift is divided into a regional and national component, the regional level corresponding to the Humber area, as defined above, and a national area corresponding to all other parts of the UK outside of this. To delineate these impacts, we have reviewed Ørsted data combined and completed desk-based research to understand where each benefit occurs and delineate whether this impact is felt locally or nationally. Their combination represents the overall impact of Ørsted's Humber operations across the UK.

The depth and detail of this modelling means that the economic impact assessment is highly robust and takes full account of the immediate and anticipated outcomes of the Ørsted investments. Based on this underlying forecast and modelling, we have performed a full EIA in line with HMT Green Book guidance, translating the existing and projected outputs into economic impacts and incorporating discounting and additionality in line with best practice.⁶

In addition, we have used an industry-standard methodology developed by Renewable UK and informed by up-to-date information on the performance of the Ørsted wind farms to model the amount of carbon abated through the intervention. Based on the energy production capacity of the Ørsted wind farms, this incorporates up-to-date data on carbon abatement pricing from the Department for Business, Energy & Industrial Strategy⁷.

⁶ We have applied additionality to the GVA impacts to represent deadweight (outcomes that would have taken place without the Ørsted investment); displacement (the extent to which an increase in economic activity or other desired outcome is offset by reductions in economic activity or other desired outcome in the area under consideration or in areas close by); and leakage: the extent to which effects "leak out" of a target area into others).

⁷ Department for Business, Energy & Industrial Strategy Carbon Abatement pricing index [Valuation of greenhouse gas emissions: for policy appraisal and evaluation - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/674212/Valuation_of_greenhouse_gas_emissions_for_policy_appraisal_and_evaluation_-_GOV.UK.pdf)

Our approach is illustrated below:

Ørsted operational and investment data: a detailed view of Ørsted's operations and economic activity in the Humber and their proposed future investments.



Modelling past impacts and projecting future impacts: Building a comprehensive model of Ørsted's impact on the economy to date, and projecting economic impacts based on confirmed future investments to 2030.



Economic impact assessment: converting historical, existing, and expected investment into overall economic impact covering two decades of activity in the Humber, applying HMT Green Book guidance on discounting and additionality.



Carbon abatement assessment: calculating the carbon emissions abated through the increase in energy generation capacity provided by the Ørsted wind farms, BEIS carbon values per tonne of CO₂ to convert to total economic value.

The rest of this section describes the different elements of the modelling process and how they have been constructed.



Figure 3 - Ørsted's Service Operations Vessels, operating from the Port of Grimsby

3.2 Impacts

3.2.1 Calculating economic impact

Economic impact is composed of several main elements which demonstrates the additional activity made possible through Ørsted's Humber investments:

- direct employment by Ørsted in the Humber region.
- indirect employment generated and sustained as a result of the Ørsted investments in the Humber.
- construction employment generated to build the wind farms.
- additional expenditure in the economy through the increase in direct and indirect employment, which in turn induces an employment impact.
- skills provision sustained directly by Ørsted.
- direct expenditure by Ørsted in the local economy on social and community projects.

For each element of the model, we have used an appropriate GVA multiplier to represent the value of this additional employment or skills provision:

- For direct employment, we have attributed a GVA value to each job drawing on data from the Low Carbon and Renewable Energy Economy (LCREE) Survey,⁸ which provides current information on offshore wind turnover and employment.
- For support and supply chain employment, we have attributed a GVA value to each job based on the appropriate manufacturing output and employment figures for the Humber region.⁹
- For indirect construction employment, we have attributed a GVA value to each job based on the appropriate construction output and employment figures for the Humber region.¹⁰
- For induced employment we have attributed a GVA value to each job based on the appropriate average output and employment figures for the Humber region.¹¹
- For apprentices, we have attributed a GVA value to each apprentice using established GVA values for NVQ level 3 courses.¹²
- To model the impact of direct outreach expenditure, we have converted this spending to GVA using national ratios from the Annual Business Survey.¹³

These GVA values are combined for a total GVA impact, which demonstrates the additional economic effect generated by Ørsted.

Further detail on each element is provided overleaf.

⁸ [Low Carbon and Renewable Energy Economy \(LCREE\) UK, 2020.](#)

⁹ [Regional gross value added \(balanced\) by industry: local authorities by ITL1 region.](#) Yorkshire and the Humber edition, 2021.

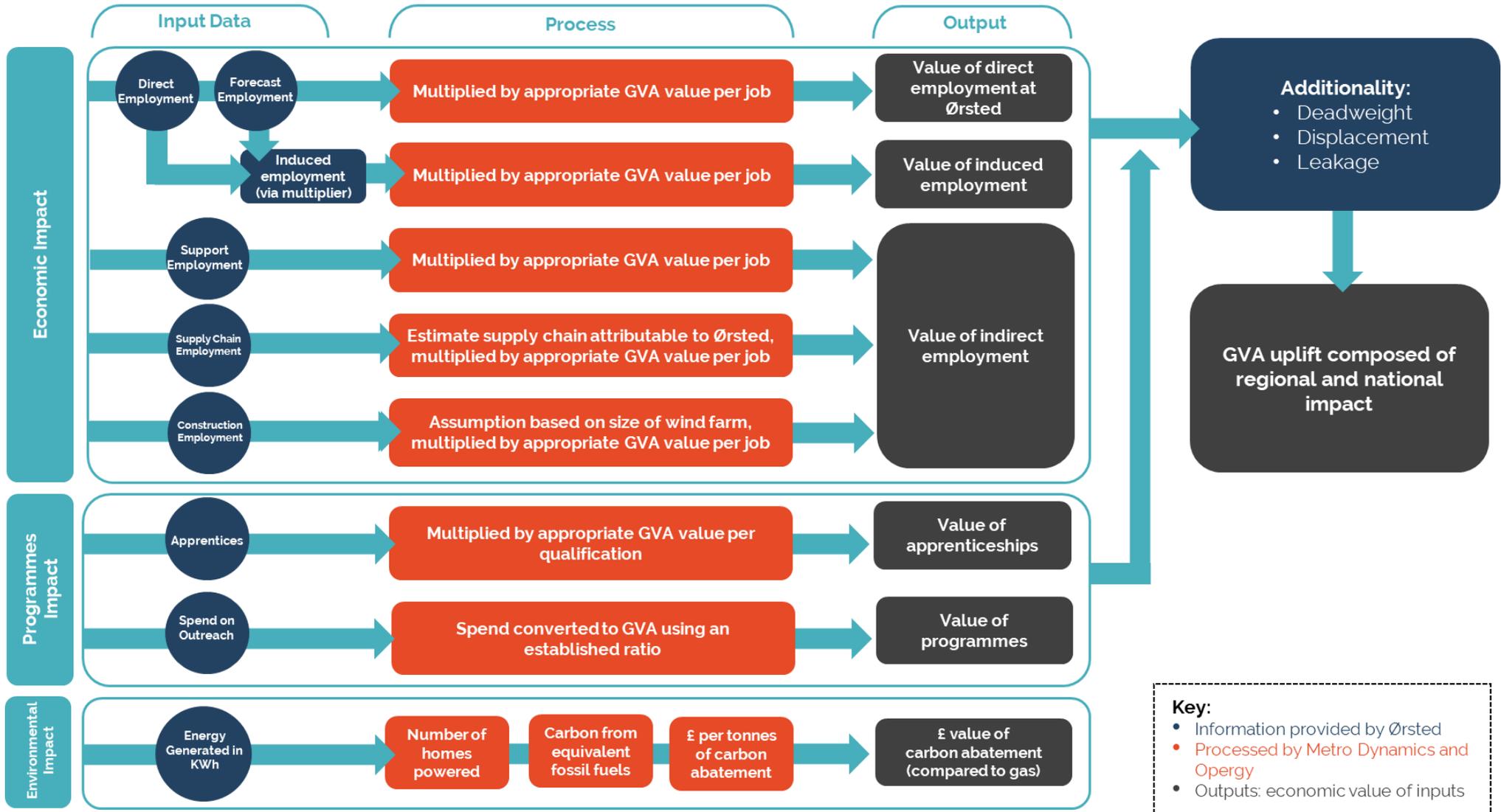
¹⁰ Ibid.

¹¹ Ibid.

¹² New Economy Unit Cost database v2.0.

¹³ [Non-financial business economy, UK and regional \(Annual Business Survey\): 2019 results.](#)

3.2.2 Model diagram



3.2.3 Direct employment

Ørsted employs skilled workers directly out of the East Coast Hub in Grimsby, who manage operations of the offshore wind farms within a proximity to the Humber. This incorporates office-based workers and technical staff. As the number of wind farms has grown over the last decade, so has the scale of operations, generating a steadily increasing economic impact in the region. We have used data provided by Ørsted on workforce numbers to model the impact of this employment.

3.2.4 Support employment

Alongside direct Ørsted employment, a range of long-term contractors such as turbine OEM suppliers, facilities management, or from the maintenance vessels that service the wind farms, also work out of the East Coast Hub. This workforce is in place directly as a result of Ørsted's investments, and work closely with its staff on site to administer and maintain the developments. We have used data provided by Ørsted on workforce numbers to model the impact of this employment.

3.2.5 Supply chain employment

Ørsted commissions specialist manufacturers and service providers from leading firms across the UK to provide the components and technologies it needs for the operation of its wind farms and other investments. Over the last decade, this has resulted in the growth of specialist manufacturing services in the Humber itself, such as the Siemens Gamesa offshore blade factory which opened in Hull in 2016, or supported firms elsewhere in the UK, such as Prysmian in Wrexham, which provides Ørsted with inter-array cables. In doing so, this supply chain spending has created and sustained employment. We have reviewed Ørsted's activity in the Humber over the last decade, using desk-based research to assess when this supply chain spending occurred, and what employment benefits it created, to model the impact of this employment.

3.2.6 Induced employment

The additional expenditure in the economy resulting from Ørsted and its supply chain firms stimulates expenditure on unrelated goods and services. We have modelled the economic impact of this effect, using established multipliers¹⁴ which demonstrate the relationship between the direct and supply chain employment and induced employment in both the Humber and wider economies. From this we have modelled the induced employment benefit and its economic impact.

3.2.7 Construction employment

Developing each wind farm generates thousands of construction jobs in the Humber region. Construction employment generated by these investments relates to the size of the development. For each wind farm, we have assumed a number of construction employees

¹⁴ HM Treasury [The Green Book: appraisal and evaluation in central government - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/424123/The-Green-Book-appraisal-and-evaluation-in-central-government-2019.pdf)

based on past trends, informed by discussion with Ørsted, and modelled their economic impact.

3.2.8 Apprentices

Ørsted provides level 2 and 3 apprenticeships, training people to work from the East Coast Hub. We have used data provided by Ørsted on apprentice numbers to model the impact of this skills provision.

3.2.9 Direct spending on outreach

In addition to its wind farm development, Ørsted has made direct investments and donations to local community and skills projects. This encompasses donations to organisations such as the RNLI, or the East Coast Community Benefit Fund, but also larger investments in local infrastructure. For instance, Ørsted has been an industry partner of the Ron Dearing University Technical College since its opening in 2017, funding new equipment, technical projects delivered in the classroom, and new facilities. Ørsted have also donated £1 million to support the development of the Youth Zone that will support thousands of young people in Grimsby and the surrounding area over the coming years, as part of the town's ambitious regeneration plans. We have modelled these effects of this expenditure on GVA within the region.

3.2.10 Modelling considerations

In line with HMT Green Book best practice, we have undertaken the modelling of impacts over the two decades of Ørsted's involvement in the Humber (2012-2030). We have applied a discount rate of 3.5% per annum to future benefits and costs, in line with HMT Green Book¹⁵ guidance.

We have also applied additionality to the GVA impacts to represent:

- Displacement: the extent to which an increase in economic activity or other desired outcome is offset by reductions in economic activity or other desired outcome in the area under consideration or in areas close by.
- Leakage: the extent to which effects "leak out" of a target area into others.
- Deadweight: outcomes that would have taken place without the Ørsted investment.
- We have applied job multiplier effects relating to the job creation portion of the GVA uplift in line with HMT Green Book¹⁶ guidance and drawing on established analysis of typical multiplier effects. We have not applied a multiplier effect to broader expenditure in the economy, which should be considered a conservative approach.

We have applied these additionality considerations to each benefit to model the impact, which is attributable to Ørsted, accounting for and removing effects which are likely to have occurred regardless, or which have been displaced or delivered from elsewhere. Our approach overall has been to use conservative assumptions wherever possible. Given the timeframes involved, it is possible to imagine quite considerable additional employment and supply chain growth related to the proposed investments. We consider the estimates

¹⁵ HM Treasury [The Green Book: appraisal and evaluation in central government - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441212/green-book-2017-18.pdf)

¹⁶ HM Treasury [The Green Book: appraisal and evaluation in central government - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/441212/green-book-2017-18.pdf)

presented here to be realistic in nature, though we recognise that there is potentially greater economic 'upside' over the long-term.

3.3 Carbon abatement

Ørsted's investment in the Humber has established a significant portfolio of offshore wind farms generating renewable power for the UK. Over the next decade, Hornsea 3 and Hornsea 4 will add to this capacity.

We have measured the energy generation capacity of Ørsted's east coast wind farms and assessed the number of homes this could provide for based on average annual usage. Assuming that this provision of clean renewable energy displaces the need for fossil fuel power, we have then quantified the amount of carbon abated, and assigned this total a value using up-to-date carbon values.

We have modelled Ørsted's east coast offshore wind portfolio using a bespoke methodology based on best practice developed by RenewableUK, the trade association for wind, wave, and tidal power industries in the UK.

To assess the energy generation capacity of the wind farms, we have used up-to-date load factors independently published online by an energy industry specialist.¹⁷ The load factor for each wind farm represents the actual output of a turbine benchmarked against its theoretical maximum output in a year. Adjusting for this provides a more accurate assessment of its capacity to generate energy. Given their similarities, for Hornsea 2, 3, and 4, we have assumed the same load factors as Hornsea 1.

The Ørsted offshore wind farms provide a renewable form of energy for the UK, abating the carbon emissions produced by alternative fossil fuel powered generation. Through the avoidance of emissions, this generates a value for the UK economy that can be represented in GVA terms. We have used a figure for the average energy consumption of each home per year to calculate how many homes could be powered by the developments. This proxy is then used to calculate how much carbon would otherwise be produced by a gas-fired power station. Multiplying this by an up-to-date assessment of the carbon price, provided by BEIS, reveals the economic value of the carbon saved through the Ørsted investments.¹⁸

¹⁷ Energy Numbers: Thinking about energy, UK offshore wind capacity factors. Correct as of 28/03/2022. <https://energynumbers.info/uk-offshore-wind-capacity-factors>

¹⁸ [Valuation of greenhouse gas emissions: for policy appraisal and evaluation](#). Department for Business, Energy & Industrial Strategy. Published 2 September 2021

Hornsea 1 Offshore Wind farm



4 Economic Impact Results

The summary below represents the results of our modelling. This demonstrates the economic impact of Ørsted's investment in the Humber. It combines the confirmed GVA impact over the last decade, and the projected impact to 2030.

Ørsted has directly invested, or enabled investment of, **£9.5 billion** in infrastructure and generation assets within proximity of the Humber region and its coast (Westermost Rough, Race Bank, Hornsea 1 and Hornsea 2. Note: Lincs offshore wind farm was acquired by Ørsted from Centrica and not included in these investment figures⁰. Over the next decade, further investments will add another **£14 billion** (Hornsea 3 and Hornsea 4).

4.1 Economic Impact

We have modelled this investment to demonstrate the Gross Value Added (GVA) – a measure of productivity – which the total investment has contributed to the economy. This represents the additional impacts of Ørsted's involvement in the Humber region. It has generated new employment, funded production, supported new training opportunities, and boosted local supply chains. Accounting for this activity demonstrates Ørsted's effect on the economy. This represents the growth effect of Ørsted's spending on the regional and national economies beyond what would otherwise have occurred.

The GVA uplift is divided into a regional and national component, the regional level corresponding to the Humber area and a national area corresponding to all areas of the UK outside of this.¹⁹ Their combination represents the overall impact of Ørsted's Humber operations across the UK.

The total national economic impact of the Ørsted investments is £2.2 billion GVA over the two decades of offshore wind investment in the Humber. This is made up of £982 million GVA over the past decade, and a further 1.22 billion GVA to 2030.

4.2 Regional GVA and Employment

Ørsted investments have made a major contribution to the regional economy.:

- Ørsted has contributed **£816 million to the Humber economy** in GVA over the past decade. Ørsted's presence and further investment in the Humber will deliver a **further £960 million** to the Humber economy in the period to 2030. This totals more than **£1.7 billion GVA**.
- It is estimated that more than **£45 million** has been invested directly into local community, education and skills development in the Humber region to date, with significant further investments planned.

¹⁹ This comprises the local authority areas of Kingston upon Hull, the East Riding, North Lincolnshire, and North East Lincolnshire.

- There are **520 people currently employed at the East Coast Hub** in the Humber, 230 directly employed by Ørsted and the remaining being long term operations and maintenance contractors. Since 2017, **21 apprentices** have been trained at the East Coast Hub, and 20% of these are female. Over the next decade, more than **80 new apprentices** will be created across a range of technical and non-technical roles.
- Over the period to 2030, the number of people working out of the East Coast Hub will **increase to over 800**, adding 250 high value jobs in the green economy.

The effect of this investment generates economic activity through Ørsted's supply chain across the country, in construction work required to build the wind farms in the Humber, and induced jobs across the UK as a result of the increased spending:

- Further Ørsted development will **sustain 760 FTE jobs in supply chain companies** around the UK, **7,500 in construction roles**, and **1,100 across the broader economy**.

4.3 Carbon Abatement

The offshore wind investments within a close proximity to the Humber have a major role to play in the UK's journey towards net zero emissions:

- Combined, the existing and future wind farm developments create a **capacity of 8.6GW**. This will contribute **17% of capacity** for the UK government's ambition of 50GW of offshore wind by 2030.²⁰
- By 2030, investment here will generate enough electricity **equivalent to one in four homes in the UK** powered by Ørsted from assets off the Humber.
- Since Ørsted began, investments have led to **3 million tonnes of CO2 abatement**. In the period through to 2030, there will be a **further 21 million tonnes avoided** emissions.
- The combined value of this CO2 abatement to the UK economy is estimated at **£6.8 billion**.

²⁰ British Energy Security Strategy, HM Government, April 2022, P.16



Case Studies

- **Inspiring People Stories**
- **Demonstrating Supply Chain Excellence**

5 Case Studies: Inspiring People

5.1 Bridie Salmon – Apprentice Wind Turbine Technician

Early careers

Growing up in Grimsby, where her father owns a traditional fish smokehouse, Bridie gained a number of experiences around fish markets and the fishing industry. Instead of university, Bridie left school at 18 and went backpacking, living in Australia for a period of time, until multiple dislocations of her shoulder eventually forced her to return home for surgery.

Upon arriving home Bridie started working at a local brewery – Docks Beers – on the weekends, as well as working in her dad's smokehouse on the docks, Alfred Enderby's. It was during this time that Bridie was introduced to Ørsted, through employees working on the docks and Bridie herself running an Ørsted sponsored 10k in her local area.



Figure 4 - Bridie Salmon - Ørsted Apprentice

After this time in hospitality, often working unsocial hours for minimum wage, Bridie decided to move into offshore wind, motivated by her love of the planet, with global leaders in sustainability, Ørsted, on her doorstep.

One of her relatives, also a wind turbine technician, was another influence in her decision to join Ørsted. Bridie was able to speak with him, learn more about Ørsted and the wider industry. It resulted in her going into an apprenticeship with Ørsted, aged twenty-two.

Now two years into her apprenticeship Bridie speaks highly of how Ørsted has taken pride in hiring local people which, in turn, has helped to boost the local economy, as well as the company's responsiveness when she has raised improvement measures to support women in the company and attract more women into the industry.

5.2 Kyran Aravinthan – Apprentice Wind Turbine Technician

Military transition & early careers

Kyran is one of the older apprentices at Ørsted, aged twenty-five, having previously served in the military. Signing up to join the army aged eighteen, Kyran chose three options of parachute regiment, combat medic and engineering, opting to include two specialist roles in his options as he did not want to join the military and have nothing to fall back on afterwards.

Kyran joined as a combat medic, with the waiting time for this role only a month. After serving four years and being promoted to a lance corporal during his first year, Kyran and his team of medics were put on readiness, meaning that if anything were to happen around the world, they would be sent out as medics. He did this for two years, before then going up to Lichfield, where the Royal Observer Corps are trained, to serve as the duty combat medic.

While Kyran did begin to train to become an officer, his troop commander told him that if he had other ideas, to explore them before fully committing to his training, as it would have required him to sign on for another couple of years.

His first impressions of offshore wind originate from a relative, who told him about his job as a blade maintenance technician, leading to Kyran to research the industry and learn more about Ørsted. He read about the Armed Forces covenant Ørsted had signed, aimed at encouraging ex-military into the industry, leading to him applying to become an apprentice.

As part of his three-year apprenticeship, Kyran does a two-week offshore rotation, living on the Wind of Hope vessel which services Hornsea 2 offshore wind farm. Ørsted's strong environmental values and focus on renewables were factors in encouraging Kyran to join the company. He did briefly work in the oil and gas industry, and was offered a full-time job, though opted to wait for Ørsted instead, starting out a career in a green industry with a wind turbine technician apprenticeship.



Figure 5 - Kyran Aravinthan - Ørsted Apprentice

5.3 Jason Ledden – Senior Construction Project Manager, Hornsea 2

Military transition & movement across projects

Jason served with the Royal Marines from the ages of 17 until 22, learning a range of valuable skills during this period, including teamwork and the importance of punctuality – something that he prides himself on today. Jason worked as a welder, as well as doing some commercial diving training upon leaving the military. He worked as a commercial diver in the civils' industry, taking part in projects in Germany, before progressing to become an air diver for a Norwegian company in the North Sea. After this, he started training to be a saturation diver.

Working in America 16 years ago, Jason was injured and lost his medical for a brief time. This was around the same time that offshore wind started to grow in the UK, with Jason introduced to the sector after a friend asked him to do some consulting on a diving role for Burbo Bank. He would later become facilities manager on London Array, which at the time was the world's largest offshore wind farm.

Jason continued to progress in the industry and was asked to interview for a new role, bringing him to Grimsby, where he would work on more offshore wind projects, notably Race Bank as project manager. For the past three years Jason has been the senior construction project manager on the Hornsea 2 project.

Jason will continue to work on Ørsted projects and potentially take on the senior construction project manager role at Hornsea 3, having amassed a track record of delivering on projects. Ørsted's culture, which is very team orientated, particularly suits Jason after his experiences in the military and role being chair of Cleethorpes Town Football Club, given the fact that both depend on the whole team.

This is one of the main factors as to why Jason has spent so much time with Ørsted, while the role of supportive senior figures, who are willing to help you learn and progress up the company, has proven important as well.

The impact that Ørsted's employees, and the company, have on the planet was also cited by Jason, with Ørsted putting the planet before the business and its profits in the pursuit of improving sustainability for the next generation. Jason noted how the company regularly communicates to employees the difference they are making by delivering their renewable projects, something which is an effective motivator for them.



Figure 6 - Jason Ledden, Senior Project Manager, Ørsted

5.4 Liam Jackson – Senior Project and Contract Manager

Oil & gas transition

A former employee in the oil and gas industry, Liam (34) is now working in the renewables sector with Ørsted.

Liam underwent a four-year civil engineering apprenticeship for a family-run business after leaving school, working four days a week, while attending college one day a week. The business ceased trading six years later, leading Liam to join a number of different companies in the following years, until Covid saw his company start looking for redundancies.

Liam took redundancy and planned to take a year off work, given that he was expecting his second child, and the presence of Covid. Instead, however, Liam joined Ørsted the following week, having previously applied to join the company seven times.

He was motivated to move into renewables as he believes they are the future and is keen to look after the environment, both for his children and future generations. He found that many of the skills he uses today were ones attained during his time in the oil and gas sector, with the transition between the two industries also found to be easy.

Ørsted specifically appealed due to Liam gaining the impression that they were a great company to work for, having seen people walk around the area in branded clothing, as well as seeing their boats and offices. This indicated to Liam the size of the company and encouraged him to join. He is now senior project manager in his team after a year and a half with Ørsted.

Liam has found that the renewables industry takes great care of its workforce, offering health checks, a good pension package, as well as flexibility with work timetables. This has allowed Liam to take his children to school in the morning, before arriving at the office. Ørsted are even happy if he works from home, enabling him to take care of his children when needed. Liam has found family life to improve since working in offshore wind and at Ørsted.

Liam highlighted the impact Ørsted and the renewables sector has had for Grimsby in terms of development as a reason for his passion for the sector. He noted that it is now turning a corner having previously been rated as one of the worst places to live in England. Another factor Liam was keen to note was the diversity Ørsted has brought to Grimsby, with the company and wider renewables sector helping to change perspectives for a lot of people by allowing them to work side by side, learning about one another and their cultures.



Figure 7 - Liam Jackson, Project Manager, Orsted

6 Case Studies: Supply Chain Excellence

6.1 AMS No-Dig

AMS No-Dig became initially involved with Ørsted through the Hornsea 1 project, after being contacted to tender for directional drilling work. This marked their first principal contract and Ørsted's trust paid dividends. AMS No-Dig has since worked on Hornsea 2, carrying over everything they had learnt on the earlier project, given the similarity between the two.

Prior to its work on both Hornsea projects, AMS No-Dig had undertaken some subcontracted work for other offshore wind farms, though it is through the collaboration with Ørsted that AMS has been able to progress from onshore jobs over the past seven years, towards around 70% of their turnover last year coming from landfall jobs in offshore wind. AMS is set to continue to focus on landfall connection for confirmed future work, meaning the Ørsted projects have been the opportunity they needed to become more established and involved within the offshore wind sector.

Hornsea 1 proved to be a useful development opportunity for AMS, not only in the offshore wind sector, but also in areas such as strengthening internal procedures around health, and safety. Prior to Hornsea 1, AMS No-Dig had a part-time compliance manager and since working with Ørsted have employed an HSEQ manager full-time. This has led to greater internal benefits and environmental benefits as well, with AMS no longer using paper copies for certain work and operating online to reduce waste.

In the future, AMS hopes to be involved with Hornsea 3, though the surrounding land has already been identified as being quite different. This could mean that it proves to be a job requiring a distinct set of tools.

AMS No-Dig hopes to be involved with the Hornsea 3 project with Ørsted building on the experience and learning developed through supporting the delivery of Hornsea 1 and 2.



Figure 8 - Hornsea 2 cables being pulled through for onshore connections

6.2 BGB Scaffolding

BGB is a family run business, employing around 40 people, with 35 estimated to be qualified to work in the offshore sector. Its first collaboration with Ørsted was Walney Extension, where it helped work on both the on and offshore substations, delivering the scaffolding contract.

BGB continued working with Ørsted on Hornsea 1, adhering to the same idea from the Walney Extension project, which was that one principal scaffolder looks after all contractors. This covers cable exports, arrays and terminations. BGB began widening their scope from project to project, becoming more involved in the offshore sector in the process.

This can be seen through BGB's work with Ørsted on Hornsea 2, where they once more widened their scope. After its original focus being on the offshore scaffolding, BGB has now expanded into different areas and offers added value services, including painting, maintenance and inspection. Its work with Ørsted has proven influential in enabling it to pursue several opportunities in the offshore sector, with the current onshore to offshore percentage of the business a 50/50 split.

BGB considers its work with Ørsted as having been a catalyst for growth, attributing 100% of its work in the offshore sector to the opportunities that have been presented by Ørsted's projects. BGB's aim now is to continue growing in the UK, while going global by expanding into countries such as America and Taiwan, as the offshore sector continues developing. It hopes to be contracted with Ørsted and other developers, based on its offshore UK track record.



Figure 9 - Offshore scaffolding on Hornsea 2

6.3 Hutchinson Engineering

Hutchinson Engineering's first involvement in the offshore wind sector was around nine years ago, when it began supplying Vestas with logistical tools, before going on to supply Ørsted's Burbo Bank Extension.

Hutchinson has since expanded its offshore offering and is now at a stage where it has turnover of around £3-4mn a year for the offshore industry, from supplying a range of steel components for OEM's or secondary steel for components, including platforms, gangways, and ladders.

Its overall turnover is close to £24mn a year, while it employs around 150 people. The majority of these are based in the northwest, with Hutchinson's offshore sector being 10-20% of its overall activity. The intention is to expand further in offshore wind moving forwards, while it also supplies structures for the mobile telecoms industry, onshore oil and gas, the rail and nuclear sectors, and manufacture small-onshore wind towers.

In 2019, EEW Offshore Structures Britain (EEWOSB) secured the contract for Hornsea 2 to supply thirty of the transition pieces. It contracted Hutchinson to supply the internal platform structures. Hutchinson's scope was engineering design, manufacture of all steel components, GRP mooring and hand railing items, as well as assembling all of these structures at EEWOSB's yard on the Tees. It was able to hand over the finished product.

This project is Hutchinson's largest in the offshore industry so far, valued at £3.5mn. The installation process happened in Middlesbrough, requiring an expansion, which led to eight people being employed from local areas to support the project. The installation period for the fifteen staff was around seven months, with this completed during the Covid pandemic – work began on the site in December 2020. Out of the 150 or so employees at Hutchinson, around thirty of them worked on the Hornsea 2 project.

Hutchinson is expecting more than half of its turnover to come from the offshore wind sector in the next five years. This is down to its belief in expanding its offering in offshore wind. It cited Hornsea 2 as a big opportunity for a UK supplier of secondary steel.



Figure 10 - Internal platform structures for Hornsea 2's offshore wind transition pieces

6.4 Pict Offshore

Based in Fife, Scotland, Pict Offshore develops, builds, and supports new access, lifting and safety solutions for the offshore wind sector.

It was founded in April 2019 and is a spin off from height safety innovator, Limpet Technology Ltd. Initially, the founders of Pict had been investigating alternatives to ladder climbing in onshore wind, before then beginning to explore offshore access systems as the sector started growing, following a call for novel access solutions through the Carbon Trust's Offshore Wind Accelerator programme.

Pict Offshore started collaborating with Ørsted on some early prototypes. This included demonstrations on ORE Catapult's 7MW Levenmouth Demonstration Turbine. Following successful trials, it was agreed to conduct further tests on the Walney offshore wind farm in the Irish Sea. In 2018, it was installed onto one of the Walney turbines and trialed over the following months.



Figure 11 - PICT Offshore's Get Up Safe System

In August 2019, Pict Offshore's **Get Up Safe' (GUS) System** was certified. It is a motion compensated hoist solution, enabling technicians to safely transfer between small moving vessels and offshore wind turbines. Its motion compensation capability means the hoist automatically adjusts the line position, taking into account the movement of the boats, so that in periods of high and varying wave heights, there is no danger of collision between the technician and the boat, reducing the influence of waves on offshore operations.

In September 2019, Ørsted bought a 22.5% equity stake in Pict Offshore, helping to further support the development of the technology and use it on Ørsted projects. It has since deployed the GUS system at the Hornsea 2 offshore wind farm, using it on each of the project's 165 wind turbines, making it the first offshore wind farm in the world to deploy the system, as well as entirely design out the boat landing structures and ladders on the turbine's foundations. Moving forwards, there are three wind farms in the US where Pict Offshore could work with Ørsted as its access system provider. It also has the ambition of expanding into floating wind, with it aiming to trial systems within the next 12-18 months. A further area of focus is to integrate cargo lifting capabilities into their system as well.

6.5 Siemens Gamesa Renewable Energy

Siemens Gamesa Renewable Energy's (SGRE) investment in manufacturing facilities at ABP's Port of Hull has been a major UK success story for offshore wind.

It has led investment of more than £500mn over the last six years and created over 1,000 new highly skilled manufacturing jobs in the Humber region.

Head of Business Development, Andrew Elmes, describes the relationship between SGRE and Ørsted as "symbiotic," with both global offshore wind market leaders that have a strong track record for collaboration and successful project delivery.

Locating SGRE's blade manufacturing base at Green Port Hull was indirectly related to Ørsted's decision to create its East Coast Hub at Grimsby, supporting the creation of a regional cluster, which has since been recognized as one of the most developed of the UK clusters in the Offshore Wind Sector Deal.



Figure 12 - Siemens Gamesa Facilities at ABP Hull.

Upon breaking ground in 2015 to build the factory, SGRE relocated and expanded its training facilities from Newcastle to the new site in Hull. This saw facilities combined to create significant wind turbine blade skills and training centre. This has enabled SGRE to train more than 1,000 local people in blade production and managing complex composite materials. Prior to SGRE's investment, such composite skills did not exist in the region. It should also be noted that 97% of recruitment was local to the region.

SGRE is currently upgrading the plant to support its next generation of wind turbines with blades exceeding 108 metres in length. The facility was initially designed to produce SGRE's 75-metre and 81-metre blades. SGRE's facility has supplied seven UK projects across the east and west coasts, delivering over 1,600 blades to these, as well as one Belgian project. It plans to supply future projects in Denmark and Germany, demonstrating the export potential from the UK. It has supplied turbines to Hornsea 1 and Hornsea 2, with the blades being produced for both projects in Hull, making the region home to one of the strongest manufacturing and service clusters.

Head of Business Development, Elmes, further noted how the Humber offshore wind cluster, where two industry majors have a strong presence, has enabled the region to become the "capital of clusters" and secure the Humber's place as the UK's "renewable energy estuary". This has helped to support and strengthen regional universities, such as Hull, Durham, and Sheffield, in developing new facilities, courses and industry partnerships in an effort to further support the industry and the future workforce.

6.6 Specialist Marine Consultants Limited (SMC)

After initially beginning operations with just two employees, SMC's first collaboration with Ørsted (as DONG Energy) came in 2009 on Gunfleet Sands.

Following this, SMC worked on the Walney projects, where it started the vessel inspection programme for Ørsted as it is today. SMC also provides client representatives as one of its services, recommending people it has previously worked with that it believes would be suitable for the role. SMC provided this for Ørsted on Walney 1 and 2, as well as on the London Array, while doing



Figure 13 – SMC undertaking statutory inspections

the vessel inspections. On Hornsea 2, SMC has been doing an inspection on almost every vessel at some point throughout the project's lifetime. SMC has started to enter Europe, expanding into countries such as Germany and Denmark, where it has worked on several projects, before returning to the UK to become heavily involved in projects in development in the East of England. This has seen them start to consider other services they can provide, one of which has been statutory inspections, as well as supplying the above water inspections.

By expanding the range of services, SMC has grown to have around eighty employed members of offshore staff. Most work for Ørsted, both in the UK and in Europe. It also has twenty backroom staff and around 150 contractors. SMC conducts around 78% of its statutory inspections in the east coast hub, while 35% of its revenue comes from overseas. It has been working in Taiwan with Ørsted since 2018 and is hoping to expand into America.

SMC's growth over the last decade has been large, with it attributing at least 50% of it to Ørsted, which it describes as a "catalyst" for its growth. SMC continues to share ideas and standards that it believes could improve projects with Ørsted, which it says is receptive and gives consideration to. This was cited as a reason the companies share a good working relationship.

SMC believe that without Ørsted, it would have been a relatively small business and had a much smaller turnover. As well as the work it is able to get through Ørsted, it also benefits from exposure when winning contracts with Ørsted through press releases, meaning it has been able to grow its reputation and encourage collaborations with other contractors.



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