green alliance...

Growing the UK's coastal economy

Learning from the success of offshore wind in Grimsby

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By William Andrews Tipper

The views expressed in this report are Green Alliance's own.

Green Alliance
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Executive summary

More than one in ten people live in coastal communities, reflecting the UK's maritime tradition and the historic importance of its ports to the economy. Many of these communities developed around traditional industries such as fishing, manufacturing and shipping, which have declined in the face of profound global market changes in recent decades. Many coastal communities are dealing with entrenched social and economic challenges such as higher than average levels of unemployment, low wages and insecure or seasonal working patterns.

Since the turn of the century, Britain's growing offshore wind sector has played an increasingly important role in stimulating jobs and economic growth in North Sea coastal communities. Places like Teesside, Hull and Great Yarmouth have attracted inward investment of tens of millions of pounds to support new manufacturing and services for offshore wind.

In this report, we examine the experience of Grimsby, once the pre-eminent fishing port in the country and now a national hub for offshore wind. The port serves the needs of five operational wind farms (Lynn, Inner Dowsing, Lincs, Westermost Rough and Humber Gateway). It will also benefit from the construction of a sixth, Race Bank, announced in June 2015.

The offshore wind industry has become established alongside Grimsby's dominant fish processing sector, bringing a range of economic benefits to the town. These include:

Stable, long term, skilled jobs. We surveyed ten leading companies active in Grimsby's offshore wind sector, ranging from SMEs to large multinationals. These companies represent 231 direct offshore wind jobs in the town. A typical offshore wind farm has an operating life of 25 years, meaning the operations and maintenance of existing North Sea wind farms will provide jobs in Grimsby for at least a generation.

Inward investment. Major multinationals have set up permanent bases at Grimsby docks. The Danish company DONG Energy has invested over £5 million on a purpose built operations and maintenance base in the Royal Dock to serve Westermost Rough.

Strong growth prospects. Two of the companies in our survey have confirmed plans to create a total of 65 permanent new offshore wind jobs in Grimsby over the next two years. Several companies expect to create additional temporary jobs to support the construction of Race Bank.

A combination of stable national energy policy, good location and maritime legacy have been critical factors in enabling Grimsby to benefit economically from the growth of the UK's offshore wind sector.

Decisions will soon be taken in Whitehall regarding funding for offshore wind in the 2020s. If these decisions provide continuity of energy policy and contracting for low carbon electricity supply, Grimsby is likely to continue to attract infrastructure investment and see jobs growth to service new wind farms such as Triton Knoll and the Hornsea zone.

We draw two principal conclusions:

Businesses in coastal communities need energy policy continuity.
Energy policy during the current parliament will be hugely important in shaping the future economic development of Grimsby and similar North Sea coastal communities. Continuity of energy policy and funding will provide the conditions businesses need to continue to invest and grow in coastal offshore wind hubs. The government can manage the costs of extending support to offshore wind into the 2020s using a 'commit and review' process which puts the onus for cost reduction on the industry.

The Regional Growth Fund should continue to be the catalyst for offshore wind industrial development.
The Regional Growth Fund (RGF) has helped to establish the offshore wind industry in Grimsby and elsewhere. It is the most important government tool to increase the local economic benefits to coastal communities from offshore wind, because it is big enough to catalyse port modernisation. Many significant inward investments have been supported by the RGF. Resolving uncertainty over the RGF's future, and ensuring it remains available to support inward investment, is likely to be more effective than making new funding available through the Coastal Communities Fund in supporting economic development in Grimsby and similar communities.

1

Coastal Britain and offshore wind

Andrew Fox / Alamy

Economic challenges facing coastal communities

More than one in ten people in the UK live in coastal communities, reflecting the country's maritime tradition and the historic importance of its ports to the economy.[1] Many of these communities developed around traditional industries such as fishing, manufacturing and shipping, sectors which have faced profound global market changes in recent decades. Some industries have fared better than others. The decline of the British fishing fleet in particular has created enduring social and economic challenges. These include higher than average levels of unemployment, low wages and insecure or seasonal working patterns.

The government has recognised this challenge and created over 100 Coastal Communities Teams. These teams can apply for shares in a £100 million Coastal Communities Fund to support projects which stimulate local economic growth.

The development of the UK's offshore wind market over the past 15 years has offered new opportunities for a number of towns along the North Sea coast. Clusters of offshore wind industrial expertise have emerged along the length of the coastline, from Teesside in the north east to Great Yarmouth in Norfolk.

Many of these towns are benefiting from a new wave of offshore wind manufacturing investment. Siemens is investing £160 million in a factory on the north bank of the Humber in Hull to manufacture wind turbines and Associated British Ports (ABP) is investing £150 million on the same site. These developments are projected to lead to the creation of 1,000 new jobs. Offshore Structures Britain (a joint venture between Denmark's Bladt Industries and Germany's EEW SPC) has invested tens of millions of pounds to take over TAG Energy Solutions' manufacturing facility in Teesside, with an initial contract to manufacture transition pieces for DONG's Burbo Bank Extension. Some of the blades for Burbo Bank will be made at MHI Vestas's recently restored turbine production facility on the Isle of Wight.

We have focused on Grimsby in this report to provide insights into how national energy policy has shaped the economy of a coastal community which has faced particularly severe challenges.

Grimsby developed rapidly through the industrial revolution to become Britain's largest fishing port by the late nineteenth century. The dramatic collapse of the British fishing fleet in the late 1970s hit the town hard, with trawling jobs all but disappearing. The town's fishing sector adapted and survived. Grimsby is now the national hub for seafood processing, with thousands of locals working in the industry. Nevertheless, Grimsby suffers from higher than average levels of social and economic deprivation.

Over the past 15 years, offshore wind has emerged as an increasingly significant contributor to Grimsby's economy. The town's proximity to the North Sea, allied to its port infrastructure and the marine skills of its inhabitants, meant it was perfectly placed to seize early opportunities in the offshore wind sector. The port is now the leading hub for the operations and maintenance of wind farms in the central North Sea.

The future prosperity of Grimsby and the development of offshore wind in other coastal communities is inextricably linked with UK energy policy. A number of wind farms are under development which, if supported by the UK's low carbon electricity funding regime, would bring a fresh wave of manufacturing, construction and maintenance jobs to coastal towns.


Local World

Crucial decisions will shortly be taken by the government regarding future funding for low carbon electricity sources, such as renewables and nuclear. This funding is paid for by UK households as part of their electricity bills; it currently amounts to £45 per year for a typical household, or four per cent of the average energy bill.[2]

In the process of making these decisions, little attention is being paid to the scale of the benefits that additional renewables funding could deliver for the coastal towns, cities and regions in which the UK's offshore wind industry is located. Yet the example of Grimsby illustrates how just one new wind farm, Westermost Rough, has unlocked millions of pounds of international investment to build new facilities and upgrade the port's infrastructure. It will support operations and maintenance jobs in the town for 25 years.

Generating electricity from wind in the North Sea

Offshore wind was pioneered in the North Sea region. The world's first offshore wind park, Vindeby, was established off the coast of Denmark in 1991.

Since the turn of the century, the UK has led the world in electricity generation from offshore wind. The majority of the UK's offshore wind farms are in the North Sea. This includes the largest wind farm in the world, the 630MW London Array, which began operating in 2013.

This growth is set to continue. Five wind farms, representing a total of 3.2GW of new capacity, were awarded contracts for difference (CfDs) in 2014.[3] In the February 2015 CfD auction two further wind farms received contracts representing another 1.2GW.[4] In June 2015 DONG Energy announced its intention to build the 580MW Race Bank wind farm off England's east coast.

British North Sea waters will continue to be the site of wind farms of increasing size and complexity. East Anglia One, one of the successful projects in the February 2015 CfD auction, will outstrip the London Array for size. In February 2015 the planning application for Dogger Bank Creyke Beck was approved by the secretary of state for energy and climate change. The site could ultimately contain two separate 1.2GW offshore wind farms, 131 kilometres from the Yorkshire coast, each with up to 200 turbines installed across an area of around 500 square kilometres.

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UK employment from offshore wind

In 2013, the most recent year for which data is available, 13,700 people were employed in offshore wind; 7,900 direct jobs and 5,800 indirect.[5] The direct jobs are spread across over 600 companies, more than a third of which specialise in servicing the offshore wind market.[6] The overwhelming majority of these companies are SMEs: 47 per cent have fewer than 25 employees, while a further 31 per cent have between 25-249 employees.[7]

Until now, most of these jobs have been in construction and the services sector (planning, operations and maintenance etc).[8] However, the scale of manufacturing investments now being made in the supply chain will enable the UK to realise greater economic value from the industry. UK content currently accounts for nearly half (43 per cent) of the lifetime cost of UK offshore wind farms.[9] Most of this economic value is from operations and maintenance activities; a 600MW wind farm has been estimated to support 58-84 full time equivalent (FTE) operations and maintenance jobs for 25 years, with over 70 per cent of this spending taking place in the UK.[10,11] This is in addition to the jobs required to build the wind farm, estimated at 577 to 1,391 FTEs for three years.[12]

2

Grimsby's economic journey

The evolution of the fishing sector in Grimsby

Located on the south bank of the Humber, Grimsby mirrors Britain's industrial trajectory since the Industrial Revolution. As with other coastal communities, the introduction of the railway, which reached Grimsby in the middle of the nineteenth century, helped to transform the town. By facilitating the transfer of goods to and from the port, it presaged a wave of new investment into the docks.

The Royal Dock was built in 1852, complete with iconic dock tower modelled on the Torre del Mangia on Siena's Palazzo Pubblico. Two fish docks followed in 1856 and 1877.
By the end of the 19th century, Grimsby's population, which had stood at little over 1,500 people in 1800, had swollen to more than 60,000.

Its port lay at the heart of its success, as Grimsby became one of the largest and most successful fishing communities in the country. There were 450 trawlers in Grimsby in 1930.[14] Each good sized deep sea vessel had twenty men on board, while each man at sea supported four jobs on land.[15] At its peak Grimsby laid claim to being the largest fishing port in the world.

The decline of the British fishing industry was rapid and steep. Between 1948 and 1965 the number of fishermen in the UK nearly halved, from 47,824 to 25,874.[16] Grimsby continued to maintain its position in spite of these difficult conditions. In 1965, £40 million worth of fish was landed at British ports, of which £13 million was handled by Grimsby. Most of this catch was landed by Grimsby's own trawling fleet.[17]

However, the so-called Cod Wars between the UK and Iceland, which in 1976 resulted in British trawlers losing fishing rights in a large section of the North Atlantic, proved a hammer blow for Grimsby's fishing fleet. In 1976 there were 111 trawlers operating out of Grimsby, more than any other UK port.[18] Ten years later there were 37, one third of the 1976 number, in spite of the total number of UK trawlers having increased.[19] Today, there are fewer than 450 fishermen working out of Grimsby.[20]

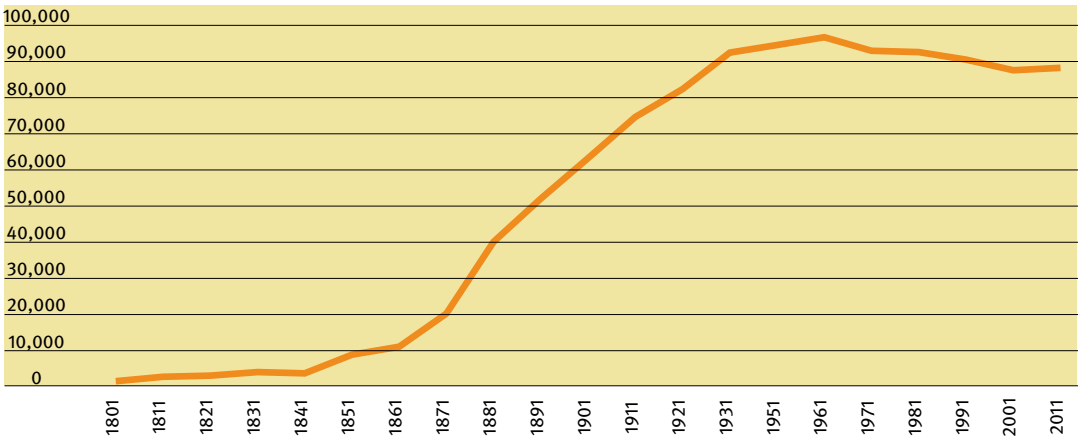
The demise of Grimsby's trawling fleet did not herald the death of the fishing industry in the town. The sector adapted. Grimsby is now the UK hub for seafood processing, handling 70-80 per cent of business in the sector.[23] The seafood processing sector in Grimsby is worth £2.5 billion.[24] It has over 100 processing related companies and employs over 5,000 locals.[25] The sector has diversified to embrace manufacturing, trade and transportation. In 2014, £300,000 was invested in a new fishing net manufacturing facility.[26]

Nevertheless, the sector continues to face significant economic challenges. In August 2015 the government agreed to make £1.34 million of public funding available to a major Grimsby fish processor after the loss of a major supermarket contract. This money is intended to support private investment sufficient to safeguard 250 jobs and enable the creation of a further 200.[27]

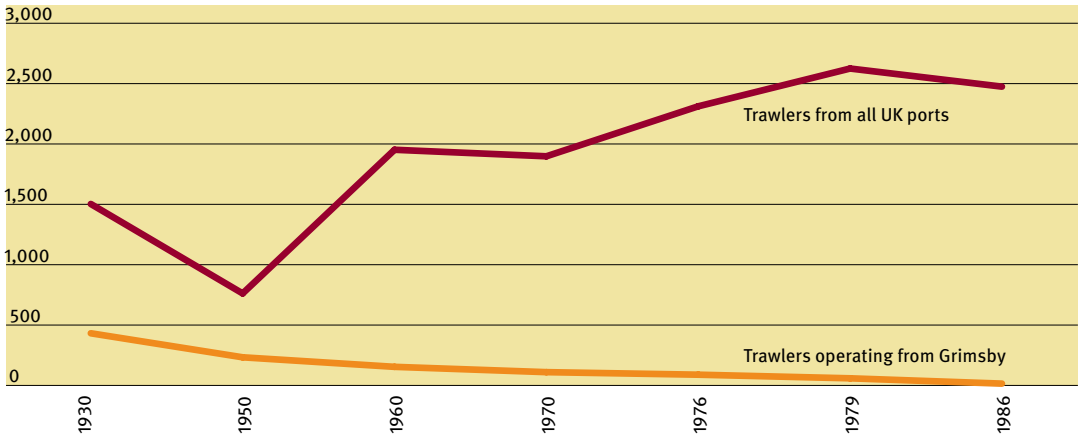
However, a single dominant sector, no matter how strong, cannot support an entire community. Unemployment in the town is thirteen per cent, well above that of other coastal communities and nearly twice the national average, while nearly a quarter of the working age population is economically inactive.[28] Youth unemployment stands at over 25 per cent and average wages are £18,500, well below the UK average.[29,30]

Local World

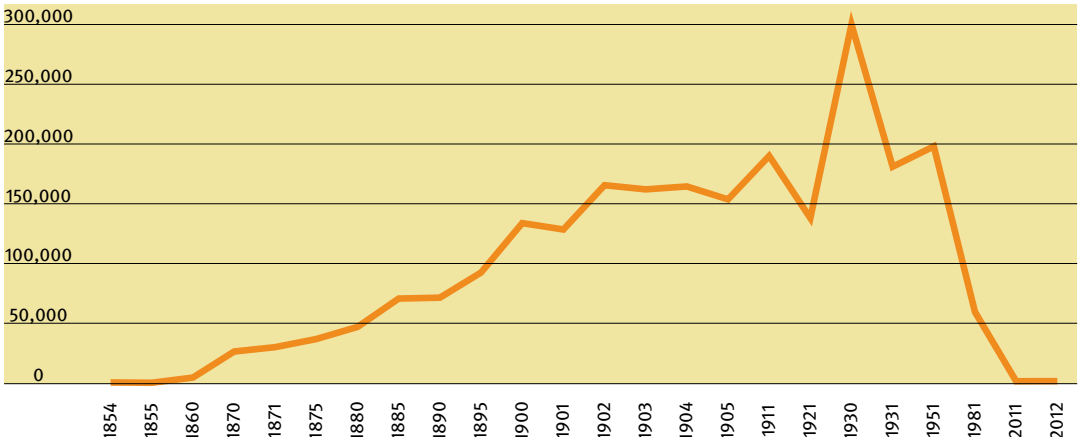
Population of Grimsby[13]



Grimsby's decline as a fishing port in the 20th century[21]



Tonnage of fish landed by Grimsby fishing boats [22]



The emergence of the offshore wind sector

In 2001 the government launched the first licensing round for offshore wind. Not long afterwards RES Energy, a British company looking for a base from which to develop two wind farms off the Lincolnshire coast, came to Grimsby after an exhaustive search along England's east coast. What gave Grimsby its edge was its location: it is closer to the North Sea than other ports in the Humber and within easy reach of planned wind farms. Its existing port facilities were considered ideal for small support vessels.

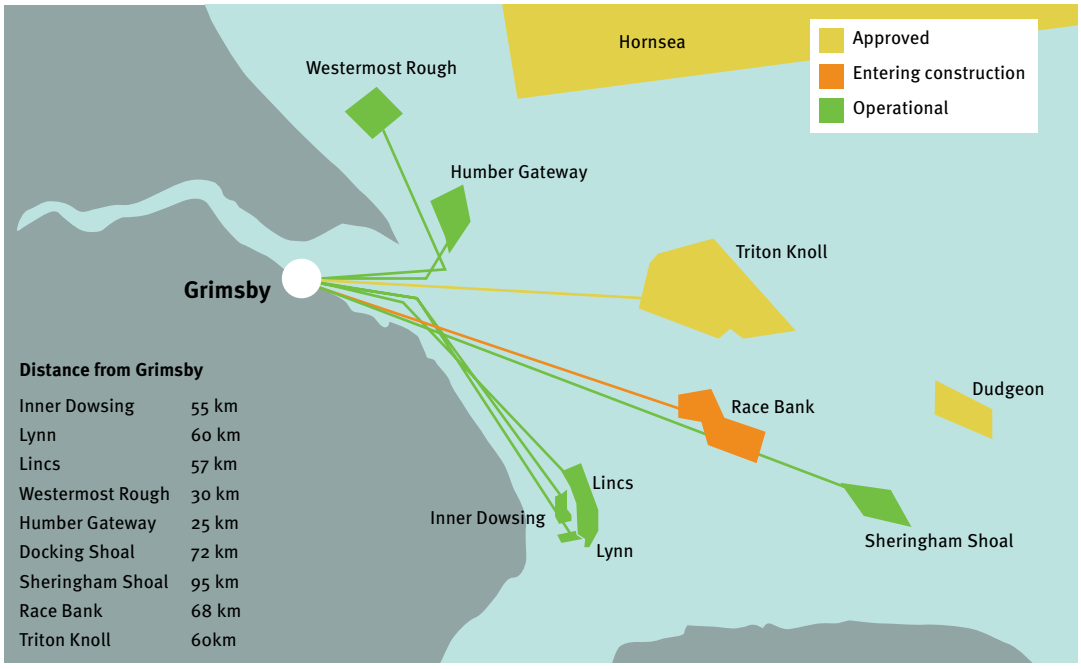
The construction of the Lynn and Inner Dowsing offshore wind farms was the first step in a new era for Grimsby. Situated east of Skegness off the Lincolnshire coast, around 60 kilometres from Grimsby, the projects were initiated in 2003 and began generating electricity in 2009. Since then, three more wind farms, Lincs, Westermost Rough and Humber Gateway, have become operational in the area. In June 2015 DONG Energy announced its intention to construct the Race Bank wind farm off the Lincolnshire coast. All are, or will be, serviced by boats operating out of Grimsby.

These wind farms have given a new lease of life to Grimsby's docks. In 2006 RES moved into the Fish Dock, which had previously been earmarked to be filled-in by its owner ABP. RES was subsequently joined by other operators such as Centrica, DONG Energy, Siemens and E.ON.

After initially working out of portacabins, several of these companies invested in permanent structures to house their growing teams. Far from being filled-in, the Fish Dock – now known as Grimsby Port East – has established itself as the base for major international companies.

The needs of these multinationals have, in turn, created a range of opportunities for local small businesses. Companies whose primary market was fishing, have now found new opportunities servicing the needs of the offshore wind sector.

Planned and existing wind farms serviced from Grimsby[31]



New opportunities for old companies
Wind Power Support

Courtesy of Wind Power Support

Wind Power Support was an offshoot of a Grimsby fishing business that, at its peak, operated a fleet of 18 boats but had entered decline during the early-2000s. In 2008, Wind Power Support began to provide assistance to Siemens and C-bed during the construction of the Lynn and Inner Dowsing wind farms. It initially supplied personnel to help with site management during construction and managed three floating hotels for construction crews. This pioneering company has subsequently developed three dedicated offshore wind crew transport vessels and employs more than a dozen staff.

The renaissance of Grimsby's docks

As commercial opportunities from offshore wind in the North Sea have grown, Grimsby has established itself as a hub for the sector, triggering a new wave of investment into the docks.

In the Royal Dock, just across the quay from Grimsby Port East, DONG Energy has constructed a purpose built £5 million operations and maintenance facility from which it will service the Westermost Rough offshore wind farm for the next 25 years. A further £5 million was invested into new lock gates for the Royal Dock as part of an agreement between ABP and DONG. Under the cutting edge new system, support vessels will be able to access the dock 24 hours a day, rather than only six hours around high tide. Grimsby Port East has also benefited from new lock gates to improve access, funded by a partnership including £500,000 from North East Lincolnshire Council's change programme.

New opportunities in the town

The needs of the offshore wind workforce are also creating a boom for service industries such as hospitality and catering. In May 2015 Travelodge announced it would be opening a new hotel in Grimsby with 75 bedrooms and 20 new jobs, followed by a Holiday Inn, which is offering 80 rooms and supporting 30 jobs. The Grimsby Renewables Partnership, a network set up to foster relations between major offshore wind developers, new and existing businesses and the local authority, has seen its membership more than quadruple in a little over two years.

In 2016 a new National College for Wind Energy will open in the Humber region. It will provide professional qualifications and short courses (post-A level equivalent) focused on the skills and training needed for the wind sector.

Courtesy of ABP

New apprenticeship opportunities
Mike Smith


Local World

In 2010, at the age of 20, Grimsby-born Mike Smith became the first RES offshore wind apprentice. This involved a four year training programme in association with the Humberside Engineering Training Association (HETA). After a year spent studying mechanical fitting, welding, machining and electrical installation at HETA, Mike undertook a three year placement with RES's operations and maintenance teams around the country. Simultaneously, he spent three years studying one week per month at the University of Lincoln. In 2014 he qualified with a degree in Mechanical Engineering.

New centres of excellence
Advanced Industrial Solutions

Advanced Industrial Solutions, a leading British supplier to the global energy industry, is investing £4 million in a state of the art offshore wind training facility in Grimsby. The facility, which is creating 30 jobs, will provide training in essential skills such as first aid, firefighting, working at height and rigging.

AIS Training

Skilled jobs that will last a generation

Grimsby's offshore wind sector supports hundreds of direct jobs. Large multinationals have established permanent teams in the docks, while a range of local SMEs have emerged, providing specialist equipment and services.

We undertook a survey of ten leading companies active in Grimsby's offshore wind sector. Some have been in Grimsby for years, while others have established bases over the past few months. These ten companies represent 231 direct offshore wind jobs in the town.

Many of these are skilled long term roles. A typical offshore wind turbine has an operating life of 25 years, so current operations and maintenance contracts offer the likelihood of jobs in Grimsby for a generation. Repowering – the process of replacing turbines at the end of their working life – is likely to offer similar job prospects to future generations of Grimsby citizens.

Two of the ten companies in our survey have confirmed plans to create a total of 65 permanent new offshore wind jobs in Grimsby over the next two years. Several expect to create additional temporary jobs to support the construction of Race Bank.

Ten companies: a snapshot of current and future jobs in Grimsby's offshore wind industry

Company	Current jobs	Future jobs
DONG Energy	**22** in operations and maintenance for Westermost Rough	**45** in operations and maintenance, by the end of 2017, to service Race Bank
Siemens	**90** servicing Lynn, Inner Dowsing and Lincs wind farms **10** supporting construction of new wind farms	
E.ON	**18** for the Humber Gateway wind farm	
Centrica	**45** for Lynn, Inner Dowsing and Lincs wind farms	
Windcat Workboats	**23** in specialist crew transfer vessels (comprising **18** boat crew and **5** shore staff)	
Wind Power Support	**12** in specialist offshore support vessels	
Tidal Transit	**12** in specialist offshore support vessels	
RES	**6** technical staff	
AIS	**1** to establish new training centre	**20** by 2016-17, to operate the training centre
All NRG	**2** to establish a dedicated pre-assembly, installation and operations and maintenance services team over the next two years	
Total	**231 current jobs**	**65 future jobs**

3

Lessons for local and national decision makers

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Grimsby's development in the 21st century demonstrates the important contribution that the offshore wind industry can provide to coastal communities, whose economies often rely on a single dominant industry or employer. Grimsby's position as a crucial North Sea hub for the sector has already brought considerable economic benefits. This growth is enabling Grimsby to diversify its economy beyond fish processing, and to tap into a growing, global high tech sector.

The rise of Grimsby as an offshore wind hub can be attributed to two critical factors:

Stable energy policy

There was no 'big bang' in offshore wind in Grimsby. The local sector developed gradually, in response to the needs of the growing market in the adjacent North Sea. Over the course of a decade and a half this has resulted in a number of international companies moving from temporary to long term bases in the town. It has led to millions of pounds being invested into upgrading the port's infrastructure and the creation of training and career opportunities for young people who might otherwise have moved away from the region.

Location and maritime legacy

Grimsby's proximity to planned wind farm sites and its existing port facilities made it the obvious place from which to build early North Sea offshore wind farms. Its maritime tradition gave local businesses such as Wind Power Support a headstart, with the skills and knowledge necessary for a new offshore industry (see feature on page 15).

Other ports such as Great Yarmouth and Lowestoft, and regions such as Teesside will have comparable geographical and skills strengths, and their economic prospects are also likely to be affected by how offshore wind develops in the North Sea.

The cost of offshore wind

Calculated in terms of the levelised cost of energy (LCoE) – a per unit calculation in which the total cost of power generation is divided by the power generated – the cost of generating electricity from offshore wind fell by 11 per cent between 2010 and 2014.

The newest offshore wind farms can now deliver electricity at a cost of £121 per MWh.[32] The two that were successful in the February 2015 CfD auction both received strike prices below £120 per MWh, indicating that costs are coming down faster than was anticipated even a couple of years ago.[33]

Teun van den Dries / iStock

What strong energy policy could mean for Grimsby

Triton Knoll

The proposed wind farm site, Triton Knoll, is located approximately 20 miles off the coast of Lincolnshire. It has the potential to host an offshore wind farm up to 900MW with up to 288 turbines. This is bigger than the sum total of all the wind farms currently in operation or under construction and serviced from Grimsby.

If Triton Knoll is built, the economic benefits for Grimsby would be considerable. Economic analysis suggests that over £1.3 billion would be spent in the UK during its construction. Construction of the electrical system alone would support 50 full time equivalent jobs per year for five years across Lincolnshire.[34]

A combination of relatively shallow seas, high wind speeds and proximity to shore should make Triton Knoll an efficient and economically competitive wind farm. In the absence of any indications regarding future CfD auctions, or the money available under the current and future LCF, it is unclear when, or if, Triton Knoll will be built.

Conclusion

Past government policy has helped to deliver over £10 million of business investment into Grimsby, bringing regeneration and a range of new economic opportunities. To ensure that business confidence is maintained and investment in the UK's offshore wind sector continues, bringing further economic benefits to the UK's coastal communities, we make the following two recommendations:

1. Businesses in coastal communities need government energy policy continuity

There is a five to ten year lag between energy policy and investment in infrastructure and supply chains. Grimsby will benefit for two decades or more from operations and maintenance of the existing wind farms, built as a result of energy policy made during the previous two parliaments. However, it is unlikely to grow its port-based economy without policy and investment continuity in the current parliament. Decisions on the allocation of the remainder of the current levy control framework (LCF) will determine if the Triton Knoll wind farm goes ahead. Whether or not the rest of the Hornsea offshore wind zone is developed will depend on post-2020 LCF policy.

The debate is raging about the cost of the existing LCF, and how best to approach renewables funding for the next LCF period. The politically charged nature of these discussions, and the uncertainty around the future of UK renewables policy, is already undermining development of the UK's offshore wind supply chains. A major 2014 industry study, commissioned by the government, concluded that, "the lack of clarity about support for offshore wind post-2020 led to some developers saying that they will be refraining or pulling back from developing future investments. For supply chain companies, this translates into a lack of willingness to invest in new facilities and capacity to secure orders from the new investments that do go forward."[35]

The Committee on Climate Change (CCC), a government statutory advisory body, has recommended that the government address this uncertainty by confirming the objective and size of the next LCF as soon as possible. The CCC estimates that an LCF of roughly £9 billion in 2025 would be sufficient to support investment in low carbon electricity generation and provide conditions to reduce costs.[36] It is expected that the government will make its decision by the middle of 2016.

Previous Green Alliance analysis has highlighted that a steady deployment trajectory would avoid 'boom and bust' dynamics and create the best conditions for cost reduction and supply chain growth.[37] We proposed a 'commit and review' approach in which the government makes sufficient funding available to support deployment of a minimum of 1.5GW of offshore wind per year throughout the 2020s. Since delivering this commitment would require ongoing funding support via the LCF, it should be made conditional on the costs of offshore wind continuing to come down.

Local decision makers have historically had little influence on national energy policy but any MP or council leader who wants to see the sector grow should seek to understand the link between national debates on renewable energy policy and their local economic development strategy.

2. The Regional Growth Fund should continue to be the catalyst for offshore wind industrial development

Many of the most significant private sector investments into coastal communities have been supported by the Regional Growth Fund (RGF), the government's flagship investment support fund which will make up to £3.2 billion available to the UK's regions between 2011-17. The DONG Westermost Rough operations and maintenance facility benefited from RGF support, enabling upgrades to the Grimsby Royal Dock infrastructure, alongside construction of the facility itself.

Currently, the RGF's future is mired in uncertainty. There is no clarity as to what will happen when the current funding period ends in 2017. There are also questions as to whether unallocated money will be clawed back as part of the government's cost cutting efforts.

With the UK's installed offshore wind capacity set to more than double within the next five years, making further money available under the RGF would be an effective way for the government to increase business investment into the UK, to service the needs of this expanding market. For places like Grimsby, the impact would far outstrip that of the Coastal Communities Fund (CCF), the government's preferred funding scheme for supporting economic development in coastal communities. So far, the CCF has typically been used to fund projects that support tourism.[38]

Endnotes

[1] 6.2 million people live in 274 coastal built up areas with a population of over 1,000 people in England and Wales, representing 11 per cent of the total population. Office of National Statistics, October 2014, *2011 census: coastal communities*

[2] Committee on Climate Change, December 2014, *Energy prices and bills – impact of meeting carbon budgets*

[3] Beatrice 664MW, Burbo Bank extension 258MW, Dudgeon 402MW, Hornsea One 1,200MW, Walney Extension 660MW

[4] East Anglia One 714MW, Neart na Gaoithe 448MW

[5] BIS, March 2015, *The size and performance of the UK low carbon economy. Report for 2010 to 2013. Table 2.0 – Employment by sector, 2013*

[6] BIS, March 2015, *The size and performance of the UK low carbon economy. Report for 2010 to 2013. Table 1.0 - Number of firms by sector, 2013*

[7] RenewableUK, September 2013, *Working for a Green Britain and Northern Ireland 2013-23*

[8] According to industry figures, 30 per cent of UK offshore wind jobs are in construction and installation, 25 per cent in planning and development, 18 per cent in support services, 16 per cent in operations and maintenance and ten per cent in manufacturing. From: RenewableUK, September 2013, op cit

[9] Offshore Wind Programme board minutes, 22 May 2014, www.thecrownestate.co.uk/media/373210/owpb-05-2014-minutes.pdf

[10] Vattenfall and ScottishPower Renewables, August 2014, *East Anglia ONE offshore windfarm supply chain plan*, www.gov.uk/government/uploads/system/uploads/attachment_data/file/429411/EA1_SC_plan_600MW_DECC_Shortened_19.3.15.pdf

[11] BVG Associates, 2014, *Offshore wind: potential for increased UK content*

[12] Vattenfall and ScottishPower Renewables, August 2014, op cit

[13] Figures courtesy of Grimsby Central Library

[14] HM Government, 1931, *Sea fisheries statistical tables 1931*

[15] James Meek, 23 April 2015, 'Why are you still here?', *London Review of Books*, Volume 37, No 8

[16] HM Government, *Number of UK fishermen: 1938-2012*

[17] R A Beddis, 1967, *Focal points in geography 1: case studies*

[18] Ministry of Agriculture, Fisheries and Food (MAFF), 1978, *Sea fisheries statistical tables 1976*

[19] MAFF, 1988, *Sea fisheries statistical tables 1986*

[20] In 2013 there were 442 fishermen in Grimsby. From: Marine Management Organisation, 2014, *UK sea fisheries statistics 2013*

[21] Data taken from UK sea fisheries statistics archive, webarchive.nationalarchives.gov.uk/20140108121958; www.marinemanagement.org.uk/fisheries/statistics/annual_archive.htm#1970

[22] Figures courtesy of Grimsby Central Library

[23] 2012 Grimsby seafood village presentation, www.seafish.org/media/632430/seafood%20village%20ivan%20white.pdf

[24] Grimsby Fish Merchants Association, www.grimsbyfishmerchants.co.uk/news/20--seafood-grimsby-a-humber

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