Triton Knoll Offshore Wind Farm Project

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EV003: Regeneris economic impact study

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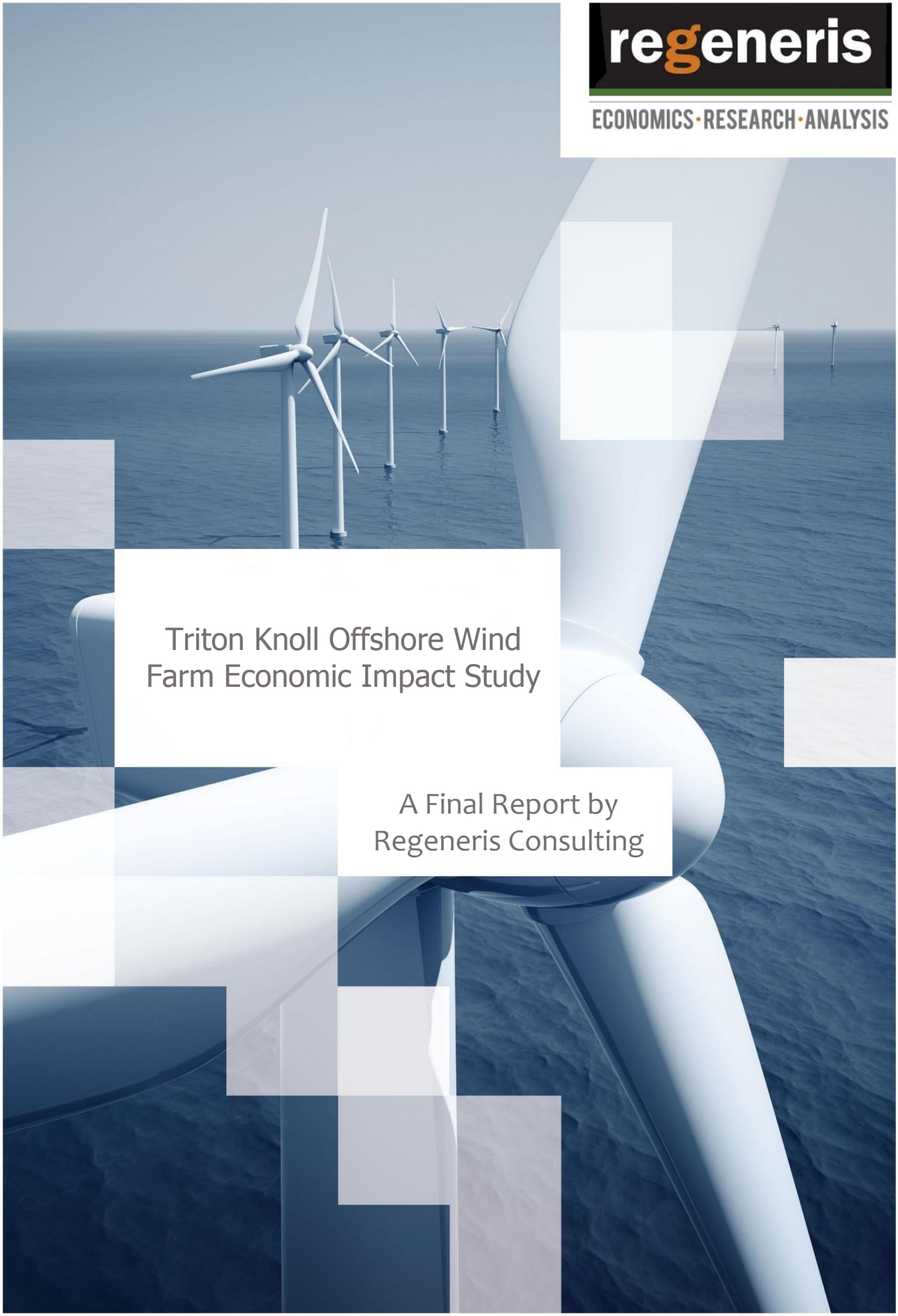

Triton Knoll Offshore Wind Farm Economic Impact Study

A Final Report by Regeneris Consulting

Triton Knoll Offshore Wind Farm Ltd

Triton Knoll Offshore Wind Farm Economic Impact Study

3 August 2016

Regeneris Consulting Ltd
www.regeneris.co.uk

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Report Summary

The Scheme

i. Two of the leading renewable energy groups in the UK, RWE Innogy and Statkraft are developing an offshore wind farm at Triton Knoll 21 miles (33km) off the Lincolnshire coast. The proposed wind farm would consist of up to 288 wind turbines and have a maximum generating capacity of up to 900 MW.

ii. The wind farm is being developed as a joint venture between RWE Innogy and Statkraft, with both companies having a 50:50 share in the project, with RWE delivering the project on behalf of the partnership. The project began in 2003 when RWE npower renewables was awarded a contract by the Crown Estate and the Government to develop a maximum 1,200 MW offshore wind farm. This was by far the largest project awarded in Round 2 Tender process.

Profile of the Area

iii. The preferred construction port for Triton Knoll would be a new facility that could be built at the Able Marine Energy Park (AMEP), Immingham. Once the construction phase of Triton Knoll Offshore Wind Farm has been completed, the project anticipates using a Humberside port, as its primary operations and maintenance base. In order to assess the impact of Triton Knoll, this report will measure the level of impacts across the Humber area (which for the purposes of this report we are considering to include North Lincolnshire, North East Lincolnshire, City of Hull and the East Riding of Yorkshire) and nationally.

Direct Benefits of the Development

iv. Based on similar offshore wind projects previously delivered by RWE Innogy, Triton Knoll Offshore Wind Farm is expected to have a number of substantial economic benefits for the UK's economy:

- The construction phase would generate an annual GVA impact for the UK economy of around £ 297 million and create 4,000 FTE person years of employment each year, including the direct, indirect and induced effects of the investment. The construction phase is expected to last for 4.3 years.
- During the operation and maintenance phase, around 1,100 FTE jobs and around £65m of GVA per annum would be supported by Triton Knoll Offshore Wind Farm nationally, including the direct, indirect and induced effects of the investment.

v. As the main local impact area, the Humber area would receive substantial benefits:

- The construction phase would support a total of 800 full -time equivalent (FTE) person years of employment per annum and generate over £52 million GVA each year in the Humber area, including the direct, indirect and induced effects of the investment. The construction phase is expected to last for 4.3 years.
- During the operation and maintenance phase, around 220 FTE jobs and annual GVA of over £11.7 million would be supported by the wind farm in the Humber area, including the direct, indirect and induced effects of the investment.

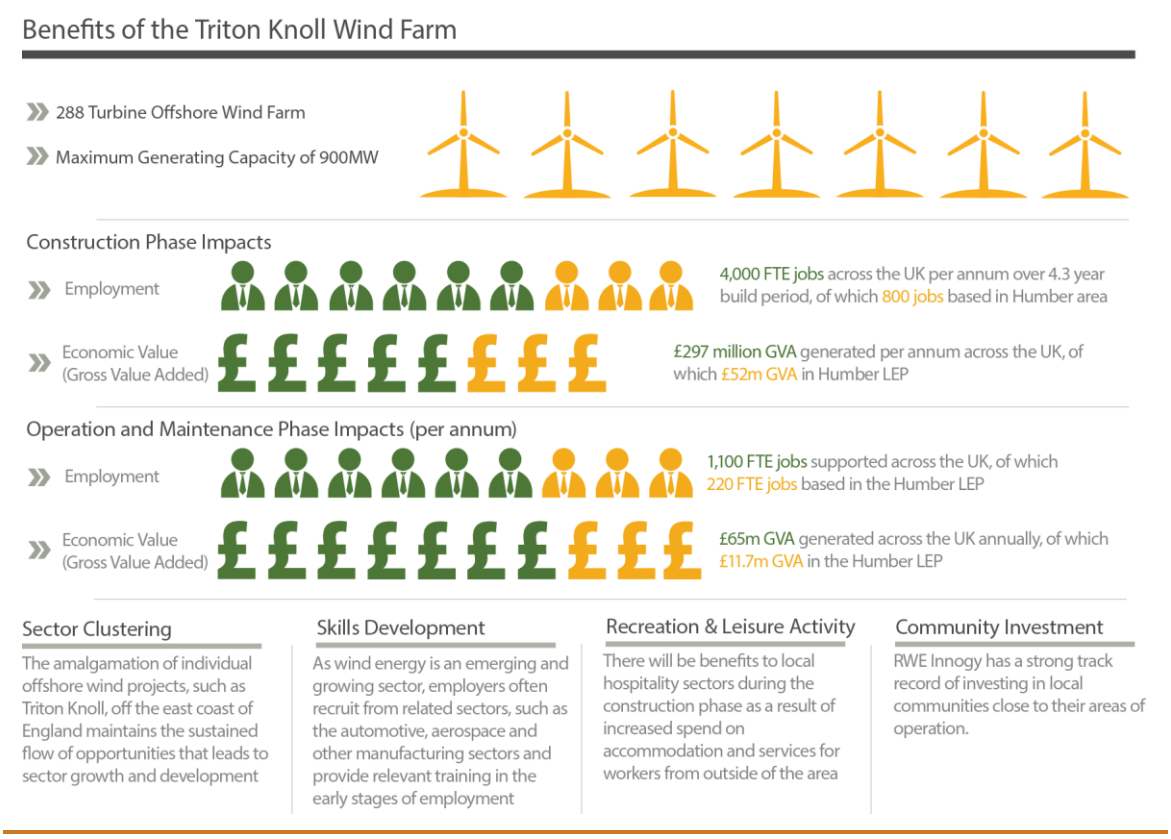
Wider Economic and Social Benefits

vi. In addition to the direct economic and employment benefits relating to the construction and operational phases of the Triton Knoll Offshore Wind Farm, there would be a range of wider socio-economic and sector development impacts:

- **Sector development and enterprise** – as companies tend to cluster in locations where their sector is strongest, the amalgamation of individual offshore wind projects, such as Triton Knoll, off the east coast of England maintains the sustained flow of opportunities that leads to sector growth and development
- **Skills and workforce development** – as wind energy is an emerging and growing sector, employers operating in this sector often recruit from related sectors, such as the automotive, aerospace and other manufacturing sectors, and provide relevant training in the early stages of employment
- **Recreation and leisure activity** – there will be benefits to local hospitality sectors during the construction phase as a result of increased spend on accommodation and services for workers from outside of the area
- **Community investment** – RWE Innogy and Statkraft have a strong track record of investing in local communities close to their areas of operation.

vii. The estimated direct economic and employment, and wider benefits of the Triton Knoll Offshore Wind Farm are summarised in the graphic below.

Figure 1.1 Triton Knoll Benefits Infographic



1. Introduction and Overview

1.1 Triton Knoll Offshore Wind Farm Ltd appointed Regeneris Consulting to carry out an assessment of the socio-economic benefits of the proposed offshore wind farm. The report provides an analysis of the potential economic benefits that would arise as a result of the construction of the wind farm and its ongoing operation and maintenance. It also considers the possible wider socio-economic benefits associated with the scheme including the effects on the development of the renewable energy sector and actions to enhance skills and employment levels in the local labour market.

Overview of the Triton Knoll Offshore Wind Farm

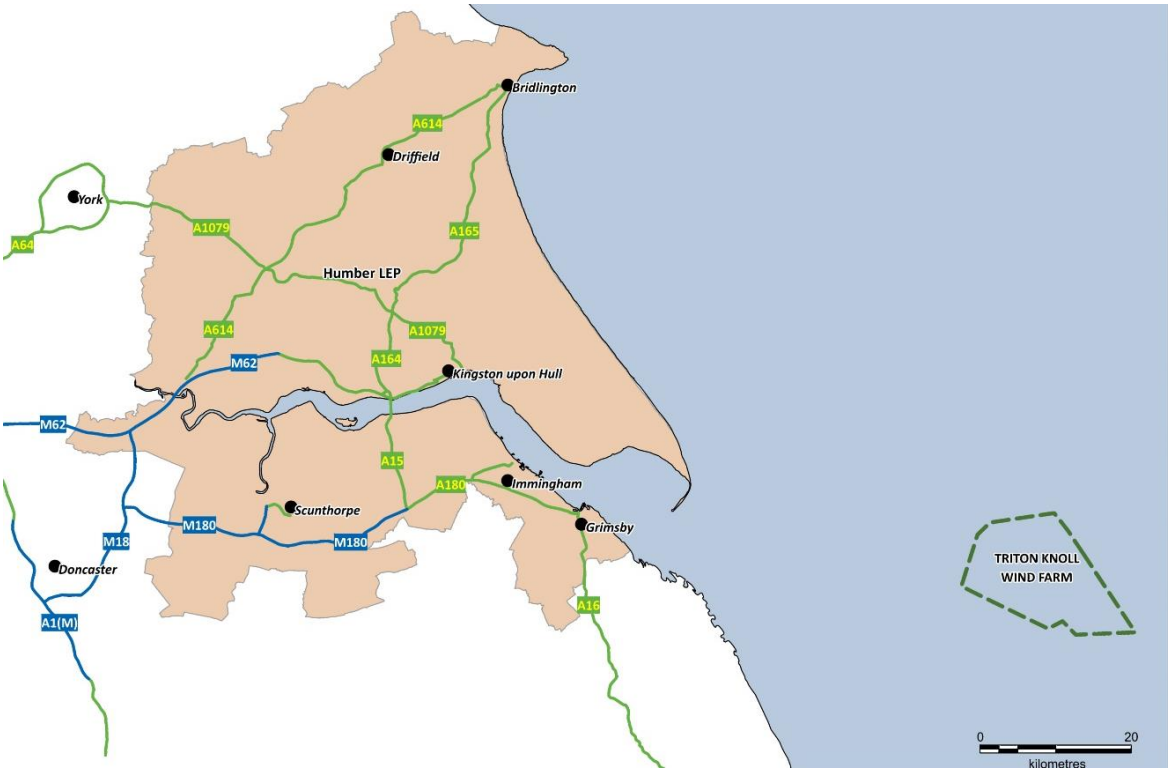
1.2 Triton Knoll is a proposed offshore wind farm to be situated off the east coast of England, approximately 20 miles east of the Lincolnshire coastline. The wind farm is being developed as a joint venture between RWE Innogy and Statkraft, with both companies having a 50:50 share in the project. The project is being delivered by a project team led by RWE on behalf of the partnership.

1.3 The project began in 2003 when RWE npower renewables was awarded the contract by the Crown Estate and the government to develop a maximum 1,200 megawatts (MW) offshore wind farm. This was one of the largest projects awarded in the Round 2 tender process.

1.4 It is anticipated that the windfarm would have a maximum export potential of up to 900 megawatts of renewable energy and be capable of generating enough electricity to meet the average needs of over 800,000 households each year.

1.5 The proposed offshore windfarm would consist of up to 288 turbines, up to 4 meteorological masts for wind data collection and up to 4 offshore substations. Each turbine would be up to 220 metres tall, with a maximum rotor diameter of 180 metres. In order to connect the wind farm to the electricity network onshore, sub-sea and underground cabling will need to be laid, with a step-up station required in the vicinity of the existing National Grid Substation at Bicker Fen (Lincolnshire) which will transform the power to match the operating voltage of the national electricity network.

Figure 1.1 Location of the Proposed Triton Knoll Offshore Wind Farm



1.6 The preferred construction port for Triton Knoll would be a new facility that could be built at the Able Marine Energy Park (AMEP), Immingham. Once the construction phase of Triton Knoll Offshore Wind Farm has been completed, the project anticipates using a Humberside port as its primary operations and maintenance base.

Content of the Report

1.7 The rest of the report is structured as follows:

- **Chapter Two** provides an overview of the socio-economic and policy context, including an assessment of the ways in which the scheme could contribute to national and local economic development and regeneration priorities.
- **Chapter Three** provides a summary of the main economic benefits of the construction and operation phases of the Triton Knoll Offshore Wind Farm, as well as wider social and economic benefits.
- **Appendix A** sets out the methodology approach used in the economic impact assessment.

2. National and Local Context

UK Context

2.1 The offshore wind sector is identified in the national Industrial Strategy as one of 12 key industrial sectors where growth is expected in the future UK economy (others sectors include, for example, automotive, aerospace, nuclear, life sciences and construction).

2.2 The Government's **Offshore Wind Industrial Strategy**[1] has the following vision for the industry:

Industry and Government work together to build a competitive and innovative UK supply chain that delivers and sustains jobs, exports and economic benefits for the UK, supporting offshore wind as a core and cost effective part of the UK's long-term electricity mix. The vision is to deliver:

- *economic growth creating tens of thousands of long term UK jobs*
- *a clear and sustainable project pipeline*
- *major manufacturing facilities in the UK*
- *the development of a competitive UK-based supply chain*
- *a technology cost-competitive with other low carbon technologies.*

2.3 The strategy is clear that this will require a higher proportion of the total value of goods and services delivered in the construction and operations of offshore wind developments to be secured by UK companies.

2.4 Recognising the key role offshore wind plays in achieving national economic and sustainability goals, and the considerable growth opportunities that exist within the sector globally, the government designated six locations as **Centres for Offshore Renewable Engineering** (CORE). This status is awarded to recognise existing port infrastructure, skills, supply chain and local government support, and to enable rapid sector growth. The Humber area is one of the six national CORE areas.

2.5 Encouraging the use of renewable resources is also one of 12 core planning principles identified in the **National Planning Policy Framework** (NPPF)[2] that underpin plan-making and decision-taking, in order to support the transition to a low carbon future. The NPPF recognises the potential for offshore wind to provide the largest single contribution towards the 2020 renewable energy generation targets for the UK.

Humber Area Context

2.6 Triton Knoll Wind Farm will have substantial impacts across the Humber area (particularly around Grimsby, the confirmed operational phase port and AMEP, the potential construction port). These will contribute towards overcoming the area's economic challenges and developing one of the area's targeted growth sectors (offshore energy).

2.7 The Humber LEP is one of the key partnerships covering the Humber area and consists of North Lincolnshire, North East Lincolnshire, East Riding of Yorkshire and Hull City Council. This is the area that will be considered as the local impact area in this report. The Humber LEP is the lead agency

[1] HM Government, *Offshore Wind Industrial Strategy: Business and Government Action,* August 2013.

[2] Department for Communities and Local Government, *National Planning Policy Framework,* March 2012.

for the Humber economic strategy, and therefore plays an important role in developing the future of the Humber economy.

Policy Review

2.8 The Centres for Offshore Renewable Engineering (CORE)'s **Building Offshore Wind in England** report supports business growth and opportunities for direct investment for the offshore wind sector in the Humber region. The policy identifies a number of key attributes which support investment in the region:

- The Humber area contains the largest enterprise zone in England, offering nearly 400 hectares of development land and an optimal site layout for offshore wind component manufactures and their supply chains
- The Humber area has 25,000 people employed in advanced and marine engineering, in addition to a broad range of transferable manufacturing and engineering skills in other sectors, necessary to support the offshore wind sector
- The region is a growing centre for offshore wind, with a range of companies in the Humber providing services and facilities to support the entire lifecycle of projects
- The nearby Universities of Hull, Sheffield, Leeds and York provide graduates to support high-skilled jobs. In particular, the University of Hull provides renewables specific Masters and Continuing Professional Development (CPD) courses.

2.9 In addition to this, there are aspirations for the area to host a National College for Wind Energy in the Humber area which would be the first national college dedicated to renewable energy in the UK. The Humber Energy Campus will provide further skills development in the Humber area, establishing partnerships with local industry and raising the profile of the energy sector in the region. Private investment also plays an important role in developing the sector locally, with £310 million investment in wind turbine production by Siemens at Green Port Hull Enterprise Zone expected to create up to 1,000 direct jobs.

2.10 At a wider level, the Humber LEP Strategic Economic Plan identified the 'Humber Energy Estuary' as intrinsic to the wider economic development of the Humber LEP area[3]. Government approval of the £450 million Able Marine Energy Park to serve the offshore wind industry is also expected to progress these ambitions by creating between 4,000 and 10,000 energy related jobs.

2.11 A number of common messages can be drawn out, relating to the offshore wind energy sector, from across the local authorities' economic strategies and local planning policy:

- There is considerable potential for offshore wind power to contribute to renewable energy production locally, which is recognised as important to reducing local carbon emissions
- Renewable energy proposals are supported in the context of climate change and their contribution to overcoming energy supply problems
- Identifying and promoting this industry sector is a key strategy to economic growth, by taking advantage of the geographical location to attract investment and create jobs
- Renewable energy production is at the heart of the sustainable development agenda, encompassing environmental, social and economic sustainability.

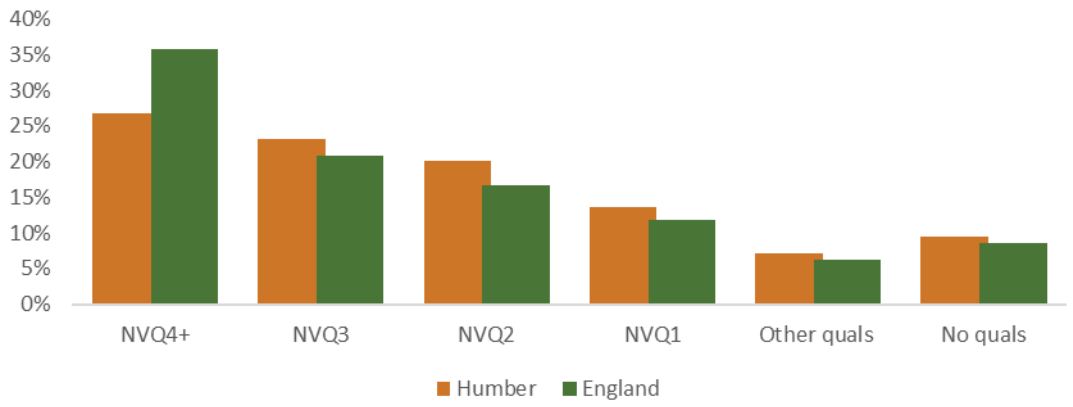
[3] Humber LEP, *Strategic Economic Plan,* March 2014.

Socio-Economic Performance

2.12 There are a number of key economic challenges facing the Humber area, which is suffering from several ongoing structural issues following deindustrialisation and globalisation. Currently 6.1% of Humber's workforce is unemployed, compared to 5.5% nationally[4]. This reflects that the Humber area is less prosperous than other regions in the UK and faces a range of socio-economic deprivation challenges.

2.13 High levels of unemployment are driven by a number of components, with skills being one key aspect. Skill levels in the region are weaker than nationally, as shown in Figure 2.1. The Humber area has a lower proportion of the population with Level 4 qualifications (degree level or equivalent) (27%) compared to nationally (36%). This reflects a shortage of higher-skilled jobs in the area and that the area fails to attract workers with higher skills.

Figure 2.1 Skills Level of Humber relative to England



Source: ONS (2015) Annual Population Survey

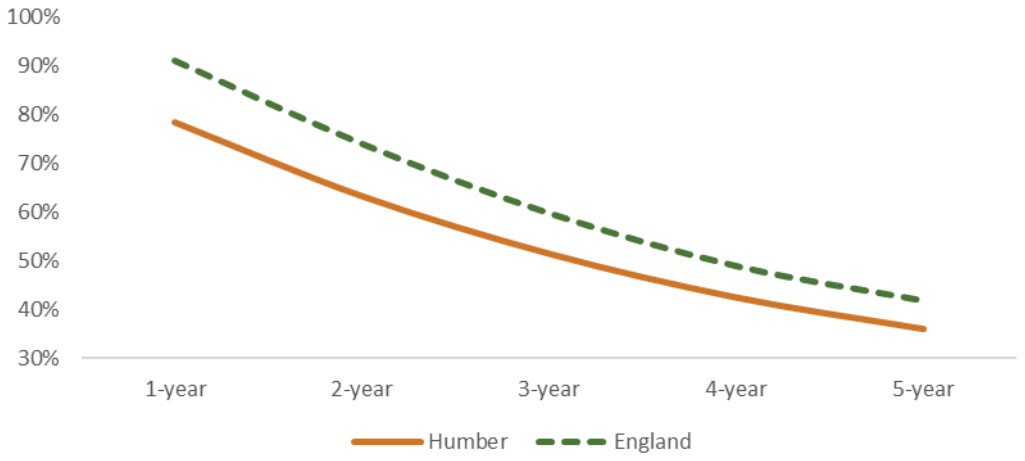
2.14 Linked to the shortage of higher-skilled jobs and a low skills base, median gross wages for employees across the region are lower than the national average. For example, in North East Lincolnshire (the local authority containing Grimsby and Immingham), the median gross wage is £24,100, compared with £27,900 across the UK[5]. Weak wage levels are a direct result of the low skill levels and the subsequent shortage of higher-skilled jobs in Humber.

2.15 In order to attract higher-value employment, there needs to be a positive enterprise environment which enables businesses to thrive. Currently, business survival rates for the Humber area are weaker than rates across the UK as a whole, with one-year survival rates at 78% compared with 91% nationally, reflecting a challenging business environment. Only around a third of businesses survive the first five years of trading (36%) compared to 42% nationally.

[4] ONS (2015) Annual Population Survey

[5] ONS (2015) Annual Survey of Hours and Earnings

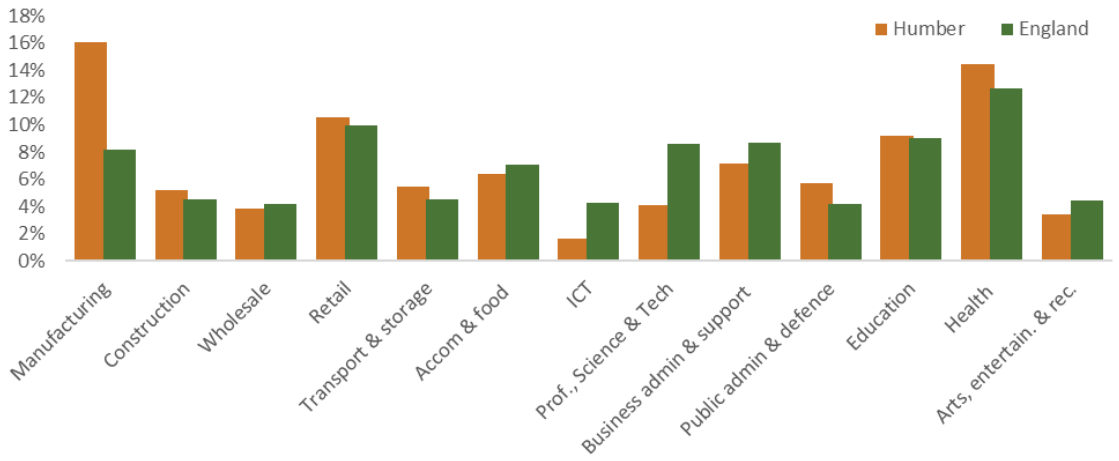
Figure 2.2 Business survival rate for businesses born in 2009



Source: ONS Business Demography, 2014

2.16 The sector specialisms of the Humber area are further driving low value employment in the economy. The industrial sector breakdown highlights a number of sector characteristics of the local economy. In particular, compared to the UK as a whole, the Humber area has a lower proportion of higher-value sectors, such as ICT and the professional, scientific and technical sectors.

Figure 2.3 Summary of Key Industry Sectors



Source: Business Register and Employment Survey, 2014

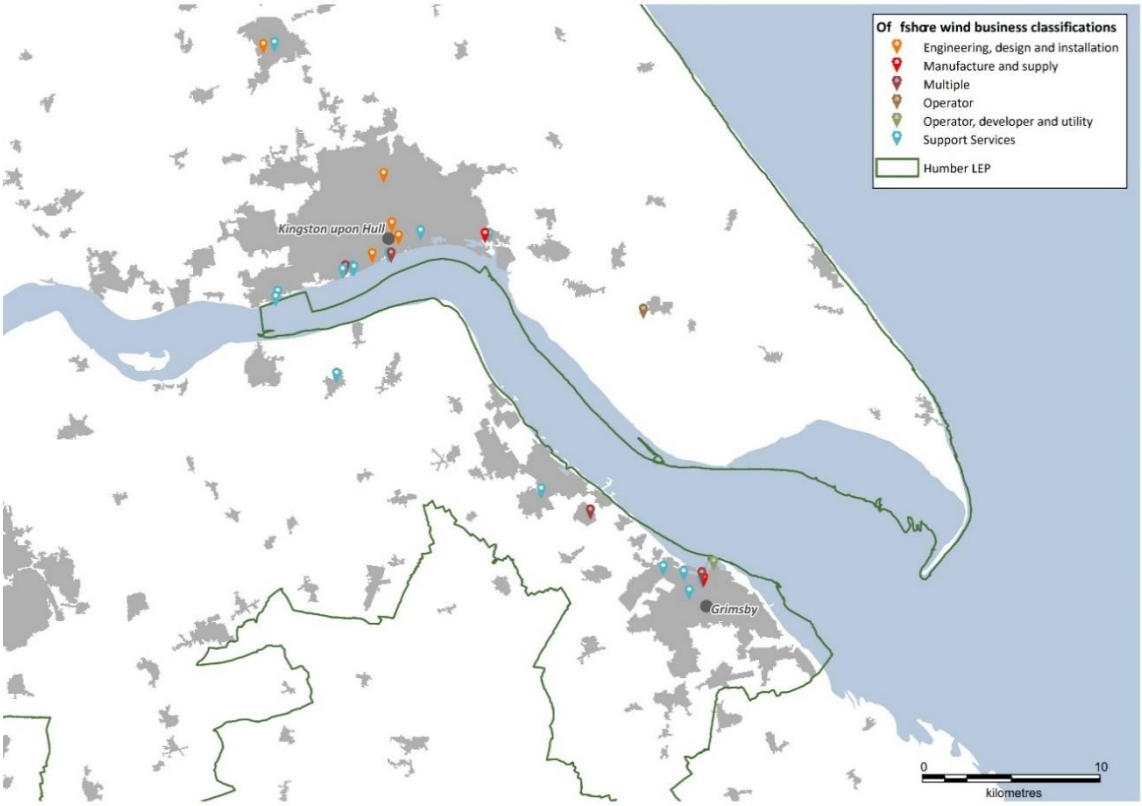
2.17 There is a need for the Humber area to strengthen its business base and employment levels and this could be achieved by attracting higher value sectors to the area. Increasing employment opportunities in higher value manufacturing sectors, such as the offshore wind sector provide an opportunity to do so, with the potential to build on the existing manufacturing skills base and a large pool of unskilled workers who can be trained and specialised in the field.

Local Offshore Wind Sector

2.18 The figure below maps a selection of the companies involved in the offshore wind sector within the Humber area, particularly in the vicinity of Grimsby and Hull. Although this only captures a proportion of companies operating in this sector, based on membership of a local sector body, it

illustrates the clustering of companies involved in manufacture, installation, operation and maintenance of the offshore energy sector, which could benefit from new business opportunities related to the Triton Knoll Offshore Windfarm proposals.

Figure 2.4 Offshore Wind Sector companies within the Humber area



Source: Information based on Team Humber Marine Alliance data

3. Benefits Generated by the Triton Knoll Offshore Wind Farm

3.1 This chapter evaluates the key economic benefits that could be generated during the construction, and long term operation and maintenance of the Triton Knoll Offshore Wind Farm, as well as a number of wider socio-economic benefits.

Construction Benefits

3.2 The construction benefits for Triton Knoll Offshore Wind Farm have been calculated based on the estimated level of investment that will take place across a number of categories of construction phase expenditure, and the anticipated proportion of this expenditure that would be sourced from within the Humber and national impact areas.

3.3 The assumptions used in the economic modelling have been agreed with the Triton Knoll project team, and draw on Regeneris' knowledge and understanding of the current UK supply chain for offshore wind.

3.4 The capability and capacity of local firms is the central driver of their ability to access opportunities in the supply chain and as a result the scale of economic benefit that will be captured in the Humber area. For a number of the largest components there are few or no firms within the UK capable of delivering these contracts, meaning that Triton Knoll can only source this work from overseas.

3.5 Triton Knoll is committed to using local supply chains where at all possible, and recognises the benefits that using local suppliers can bring, including the reduced transportation costs for goods or service providers and the wider economic benefits associated with investment into the Humber area.

UK Economic and Employment Impacts

3.6 Based on the economic impact assessment undertaken, it is estimated that the construction activity for Triton Knoll Offshore Wind Farm would lead to a total GVA impact for the UK economy of around £1.28 billion[6]. It would also be expected to support nearly 17,300 FTE person years of employment across the UK. Based on an assumption that that the construction activity would be delivered over a 4.3 year period, this is equivalent to an average of around 4,000 FTE jobs being supported across the UK each year over the construction period. These figures are broken down as follows:

- £846m GVA and 11,000 FTE person years of employment (or 2,600FTE jobs annually for 4.3 years) would be created by the supply chain spend of the developer, including its own internal planning and management roles.
- £429m GVA and 6,300 FTE person years of employment (or 1,500 FTE jobs annually for 4.3 years) would be created by the additional induced spending in the UK, occurring as a result of the additional earnings of the direct and indirect employees.

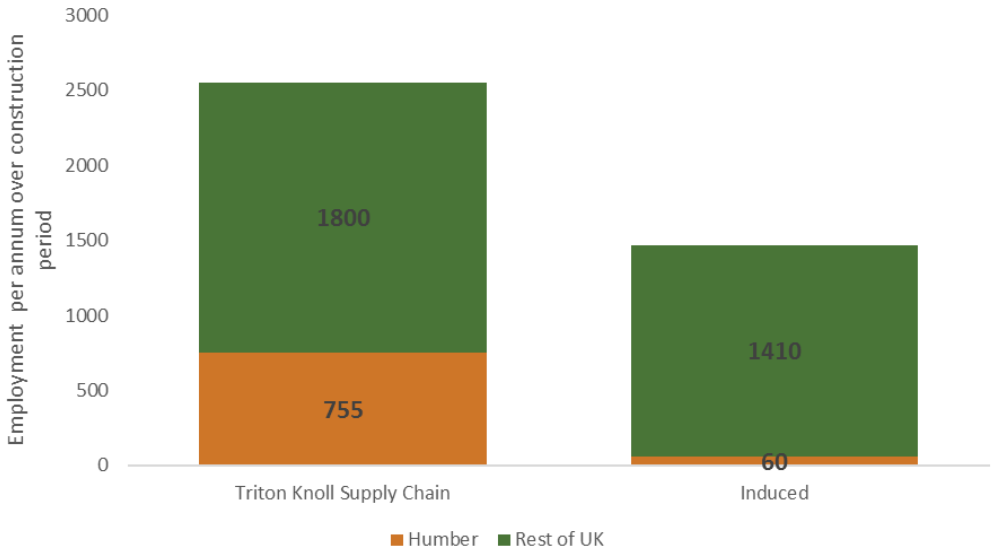
[6] This includes the direct impacts of the scheme (the results of the money initially spent in the UK by Triton Knoll), the indirect impacts (due purchases made as a result of the intervention and further purchases associated with linked firms along the supply chain) and the induced impacts (associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the intervention).

3.7 UK based supply chain jobs would involve a wide variety of roles, ranging from specialist assembly, test and quality technicians working offshore to HR staff working at the port and CNC machine operators based at their respective company's facilities.

Local Economic and Employment Impacts

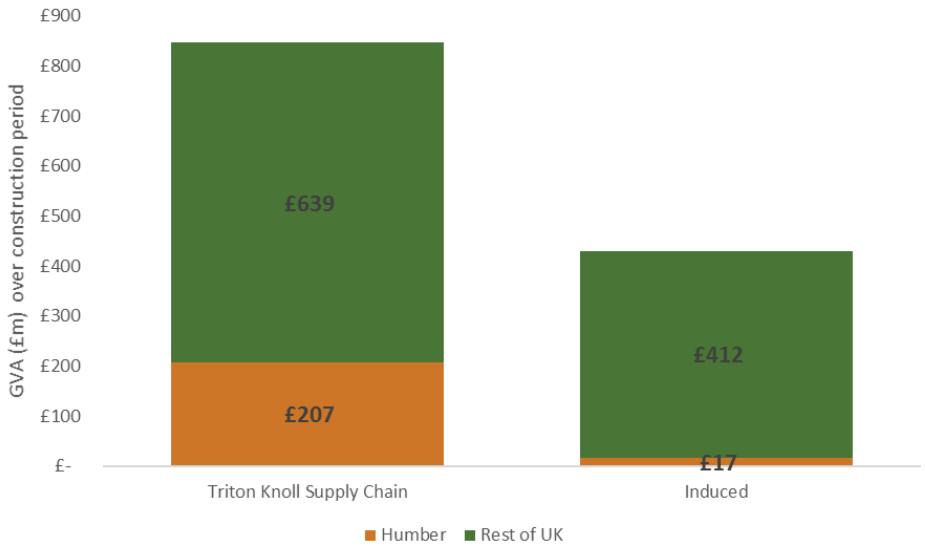
3.8 A geographic breakdown of the employment and economic gross value added (GVA) benefits of the construction phase are detailed in Figure 3.1 and Figure 3.2 below.

Figure 3.1 Employment Impact (**per annum**) of the Construction Phase



Source: Regeneris Consulting Economic Impact Modelling

Figure 3.2 **Total** GVA Impact of the Construction Phase



Source: Regeneris Consulting Economic Impact Modelling

3.9 In the Humber area, it is estimated that around £224 million GVA would be generated, supporting around 3,500 FTE person years of employment (or around 815 FTE jobs annually over 4.3 years). This would be broken down as follows:

- Around £48.2m GVA and 755 FTE jobs annually for 4.3 years would be created by the spend of the developer in the supply chain, including its own internal planning and management roles.
- Around £4m GVA and 60 FTE jobs annually for 4.3 years would be created by the additional induced spending in the Humber, occurring as a result of the additional earnings of the direct and indirect employees.

Supply Chain Impacts

3.10 With around £207 million GVA being generated in the Humber area as part of the construction phase for Triton Knoll, there is huge potential for local businesses to engage in the supply chain and ensure they are able to reap the benefits of this large investment in the Humber areas.

3.11 At present, there have been no appointed suppliers for the construction of Triton Knoll, however it is expected that these will be confirmed over Summer 2016. RWE Innogy UK has a history of investing in the local supply chain, as shown in the development of the Gwynt y Môr Offshore Wind Farm.

Case Study: Supply Chain Impact, Gwynt y Môr Offshore Wind Farm

- At 576MW, Gwynt y Môr is one of the largest operating offshore wind farms in construction anywhere in Europe,
- The 160 turbine offshore wind farm, located in Liverpool Bay, North Wales provides a huge range of business opportunities for UK and European companies. Gwynt y Môr represents an investment of over £2 billion in UK renewable energies and is shared between partners RWE Innogy, Stadtwerke München GmbH, Siemens and Green Investment Bank. The project was constructed by RWE Innogy UK.
- During the construction phase alone, the project leveraged over £660million into the UK supply chain with nearly £100million of this being awarded to Welsh companies.

Operational Benefits

3.12 As stated for the construction benefits above, the operational benefits have been calculated based on the estimated level of investment that will take place across several categories of operational phase expenditure, and the anticipated proportion of this expenditure that would be sourced from within the local and national impact areas. These assumptions have been agreed with Triton Knoll, and draw on knowledge from previous schemes as well as an understanding of the current UK supply chain for offshore wind.

UK Economic and Employment Impacts

3.13 Based on the assessment of economic impact undertaken, it is estimated that the operational activity for Triton Knoll Offshore Wind Farm would lead to an annual GVA impact for the UK economy of around £65 million. Overall, Triton Knoll Wind Farm would support over 1,100 FTE jobs annually across the UK during its 25-year operational period. These figures are broken down as follows:

- Triton Knoll is expected to directly employ 71 staff during the operation and maintenance phase of which 66 would be located in the UK. These staff would generate a combined total of around £5.7 million GVA.
- Around £38.2m GVA and 530 FTE jobs would be created by the direct spend of the developer and the further spending in lower tiers of the offshore wind supply chain (indirect spend).
- Around £21.3m GVA and 480 FTE jobs would be created by the additional induced spending in the UK, occurring as a result of the additional earnings of the direct and indirect employees.

3.14 A significant proportion of this annual O&M activity will be through the operations hub directly managed by Triton Knoll. Roles supported at the O&M hub will range across management, engineering support, stores, logistics and administration staff.

Local Economic and Employment Impacts

3.15 A breakdown of the employment and economic gross value added (GVA) benefits of the construction phase are detailed in Figure 3.3 and Figure 3.4 below.

Figure 3.3 Annual Employment Impact of the O&M Phase

Source: Regeneris Consulting Economic Impact Modelling

Figure 3.4 GVA Impact of the O&M Phase

Source: Regeneris Consulting Economic Impact Modelling

3.16 At a local level each year, it is estimated that around £11.7 million GVA and around 220 FTE jobs would be supported across the Humber area. This would be broken down as follows:

- Triton Knoll is expected to directly employ around 47 staff in the Humber area. These staff would produce a combined total of around £3.9 million GVA.
- Around £6.86m GVA and 160 FTE jobs would be created by the direct spend of the developer and the further spending in lower tiers of the local offshore wind supply chain
- Around £900,000 GVA and 15 FTE jobs would be created by the additional induced spending in the local areas, occurring as a result of the additional earnings of the direct and indirect employees.

3.17 A large proportion of this economic activity would take place around the O&M port.

Wider Social and Economic Benefits

3.18 Beyond the employment and supply chain impacts associated with the construction and operations & maintenance of the wind farm, there are a range of potential wider benefits of the scheme that need to be factored into an assessment of the overall benefit of the development.

Sector Development and Enterprise

3.19 Companies have historically tended to cluster together in locations where their markets are strongest. This is particularly true of sectors in which large goods are manufactured, such as those manufacturing wind farm components, and so where transportation is more difficult and costly.

3.20 There are a considerable number of operational, consented and planned offshore wind developments off the East Coast of England. Although the construction activity associated with individual wind farm developments is time limited, the volume of activity suggests that there is

likely to be a sustained flow of opportunities in the sector which would stimulate increased capacity (e.g. as companies start up or diversify into renewables to take advantage of new opportunities). This will leave local companies well positioned to access future opportunities.

Skills and Workforce Development

3.21 As the wind energy sector is an emerging and growing sector, there is not a substantial UK labour pool of skilled people with backgrounds in wind energy. Consequently, employers operating in this sector often recruit from related sectors, such as the exploration and production sector, and automotive, aerospace and other manufacturing sectors and provide relevant training in the early stages of employment[7].

3.22 The socio-economic profile of the Humber area has highlighted a need to stimulate local employment opportunities and broaden the economic base and has also indicated a significant local labour force with skills in manufacturing, an industry which has been declining in recent years. This suggests there is likely to be a strong supply of workers with a manufacturing background who may be able to access and benefit from employment and training activity associated with the Triton Knoll development. In addition, the recent uncertainty around the steel works in Scunthorpe means there is a need to ensure that sustainable opportunities are available for people in the area.

3.23 Triton Knoll offers its employees a wide range of on-the-job and external training programmes encompassing technical, commercial, business, managerial and interpersonal skills. This also includes the opportunity to pursue a relevant further education course or achieve chartered status with a professional institute.

3.24 Triton Knoll has already begun to pursue potential linkages with local educational institutions through the Humber LEP and local authorities. The recently established Humber UTC (located in Scunthorpe), with specialisms in engineering and renewables presents an opportunity for Triton Knoll to engage with young adults and help develop their skills for the renewable energy sector.

Recreation, Leisure and Community Investment

3.25 There will be benefits to local hospitality sectors during the construction phase as a result of increased spend on accommodation and services for workers from outside of the area.

3.26 There is little evidence to suggest that tourism activity is significantly affected by the presence of offshore wind farms; most studies based on visitor surveys have found that the majority of visitors do not expect their behaviour to be influenced (either positively or negatively) as a result of wind farm developments[8]. The presence of wind farms can help to improve revenue for hotels in the area (especially during the construction phase), with RWE Innogy UK staff spending over 7,500 nights in hotels in 2013.

3.27 RWE also has a strong track record of investing in local areas close to their areas of operation. At the North Hoyle Offshore Wind Farm, the UK's first major offshore wind farm, RWE Innogy engaged with local community groups, investing over £1.5 million. Further community investment has occurred at other wind farms constructed by RWE Innogy, including Gwynt y Môr, where community funding totalling more than £19 million will be made across the lifetime of the project,

[7] UKCES, Strategic Skills Needs in the Low Carbon Energy Generation Sector, March 2010

[8] See for example: Glasgow Caledonian University (2008) The Economic Impact of wind farms on Scottish Tourism; University of the West of England (2004) Fullabrook Wind Farm Proposal – evidence gathering of the impact of wind farms on visitor numbers; MORI (2002) Survey of Visitors to Argyll and Bute.

made available through annual payments of £768,000 to Community & Voluntary Support Conwy (CVSC).

Case Study: Investing in Local Areas, North Hoyle Offshore Wind Farm

The North Hoyle Offshore Wind Farm fund has invested over £1.5 million into local community activities and projects over the lifetime of the wind farm. This fund benefits the communities of Rhyl, Prestatyn and Meliden.

The North Hoyle Community Fund is administered by the Rhyl, Prestatyn & Meliden Community Partnerships with applications for funding received and considered locally.

25 grants were made in 2013 to support community projects in the area including:

- £2,250 to Bedford Street Community Company to pay for the service of 2 sessional workers, experienced in hosting music work-shops.
- £5,000 to the Benefits Advice Shop to increase the working hours of a representation officer from part to full time to deal with increased demand.
- £1,000 to Cruse Bereavement Care Ltd to support administration costs freeing up volunteer time to counsel clients.
- £5,000 to Rhyl Community Association towards the refurbishment of Fforddlas Community Centre which is situated in one of Wales most deprived wards.

Appendix A - Technical Appendix

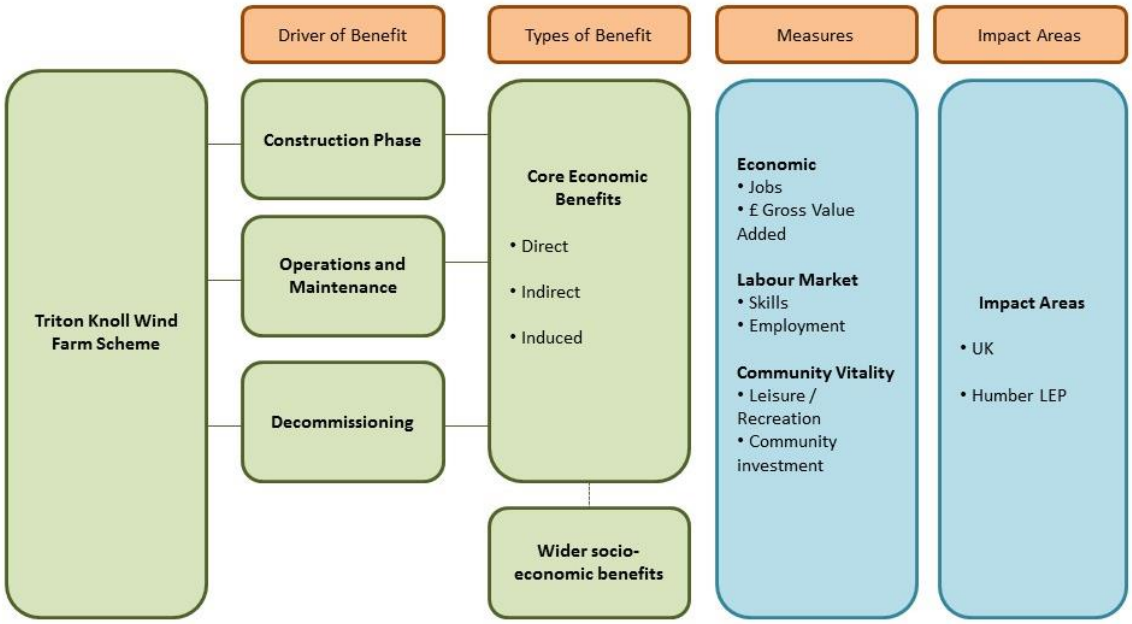
Approach to the Assessment

A.1 The research tasks underpinning the assessment cover the drivers, types and measures of socio-economic impact that the scheme could generate. The central research tasks have included:

- Desk based research and analysis of the socio-economic and policy context for the scheme
- Discussions with the delivery team within Triton Knoll to understand the costs of construction, operation and maintenance and the likely nature and geography of the supply chain
- Development of a robust socio-economic model to capture and quantify the expected impacts of the construction and operation and maintenance phases of the wind farm.
- Qualitative assessment of the wider effects of the wind farm.

A.2 The diagram below summarises the assessment framework that underpins the analysis. The main drivers, types and measures of benefit which the framework covers are set out in more detail below.

Figure 3.5 Summary of Assessment Framework for the Study



Source: Regeneris Consulting

Drivers of Benefit

A.3 There are three factors that will create socio-economic benefits from the wind farm development. These factors relate to the increased level of economic activity in the area as a result of:

1) **The construction and assembly of the wind farm and related supply chain activity**. The investment made in planning and development, manufacture and assembly, installation

and commissioning of the wind turbines delivers benefits directly to the businesses delivering this activity and also to their suppliers as the additional economic activity filters through the supply chain. The assessment considers the potential scale of benefits during the construction phase in light of the expected size and geographic location of the development's supply chain, the potential for local companies (or companies with local operations) to win the main contracts or to enter the supply chain of those that do.

2) The ongoing **operations and maintenance (O&M)**. Staff required for the operation and maintenance of the wind farm (including those in administrative and support functions) and the expenditure required to cover other overheads (e.g. the cost of spare components, grid connection etc.) provide a secondary, and longer term, source of economic impact. Again, the potential benefit is linked to the scale of investment, geographic sourcing of goods and services, the location of any new jobs which are created and the scope to recruit local staff.

3) The cost of **decommissioning or repowering.** The cost of either decommissioning or replacing components to repower the wind farm at the end of their operational period generates further economic impacts in the same way that initial construction investment does, through providing revenue to supply chain companies and supporting employment. As plans for this stage are not currently known, this socio-economic assessment covers the impacts up to but not including, the decommissioning or repowering phase.

Types of Benefit

A.4 The core economic benefits have been assessed quantitatively through an economic impact model, developed by economic impact consultants Regeneris Consulting, which estimates:

- **Direct Impacts**. This measure captures the economic activity that is directly supported by spend on the construction, operation and maintenance of the wind farm. For the O&M phase this is set out separately for Triton Knoll staff directly employed. For the construction phase this is included with indirect impacts as an overall supply chain value (recognising that it is not yet fully known how much of this would be delivered directly by Triton Knoll)
- **Indirect Impacts**. This measures the impact of the additional outputs generated by companies in the wind farm supply chain. The additional economic activity in these companies is passed down through their lower supply chain tiers and generates additional, indirect benefits for many other companies.
- **Induced.** This captures the knock-on benefits that additional employment supported directly and indirectly has in the economy as salaries earned by those employed in additional jobs are spent on goods and services elsewhere in the economy.

Measures of Benefit

A.5 The direct, indirect and induced economic benefits of the scheme are measured using three headline indicators, which allow the overall impact of the scheme on the economy and particular impact areas to be quantified. The key measures used are:

- **Jobs** – the net number of full time equivalent jobs that will be created or safeguarded as a result of the scheme

- **Gross Value Added (GVA)** – the value to the economy of the activity generated by the scheme[9].

Spatial Areas of Assessment

A.6 The quantitative assessment of the benefits of the scheme have been assessed and presented for three impact areas:

- **UK** – assesses the impacts at national level
- **Humber** – impacts are expected to be primarily concentrated on Immingham, the project's construction port, and Grimsby, the project's operations and maintenance port. However, impacts will also be felt across the area.

[9] GVA is effectively a measure of the additional profits generated in businesses benefiting from the activity plus additional salaries that are paid to their employees.

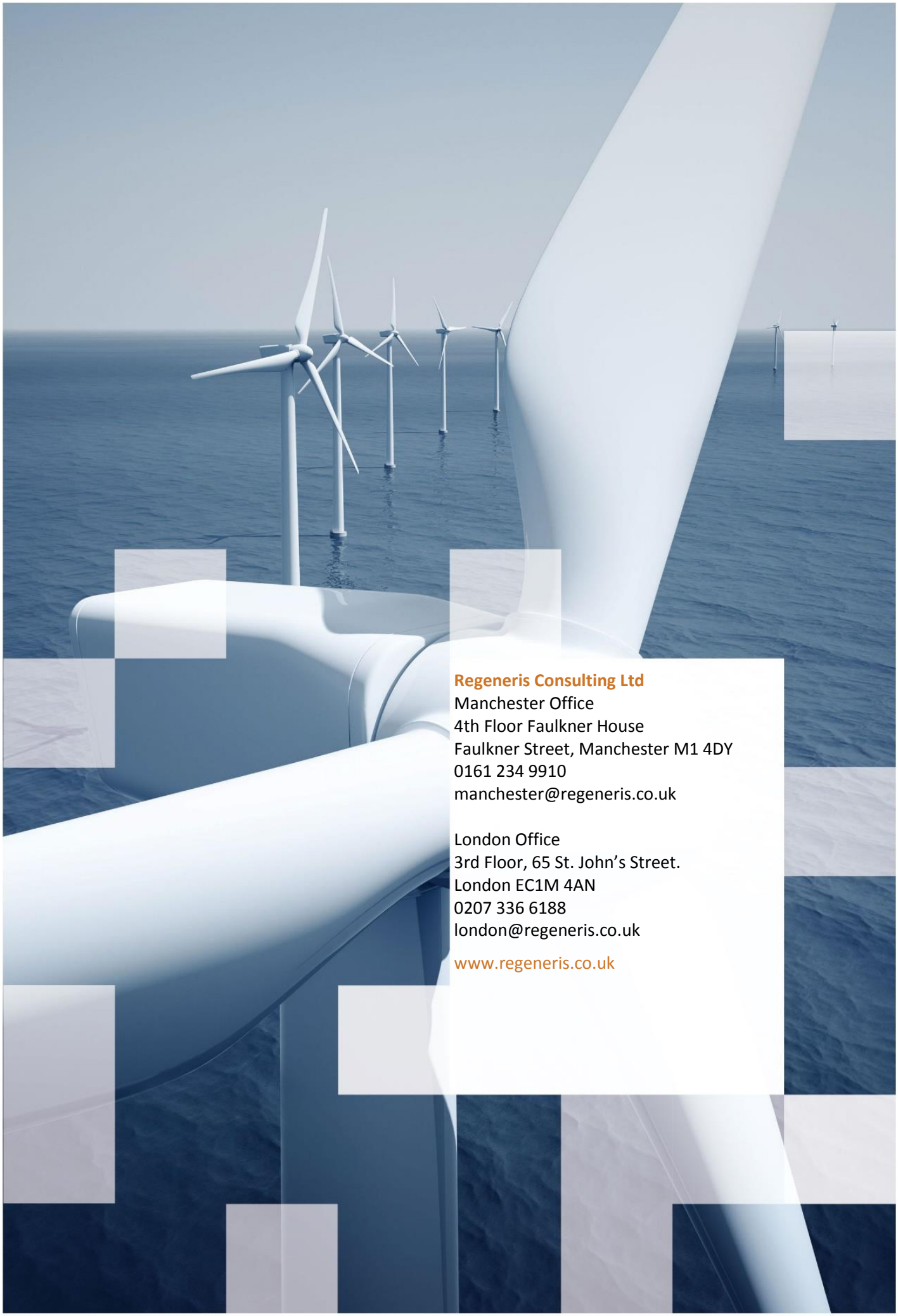


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Table 1.1 Construction Impact Assessment

	Component	Lifetime spend (£m)	% from Humber	% Rest of UK	DIRECT				INDIRECT				INDUCED			
					Employment		GVA (£m)		Employment		GVA (£m)		Employment		GVA (£m)	
					Humber	UK	Humber	UK	Humber	UK	Humber	UK	Humber	UK	Humber	UK
1. Development and Consent	Development	£74	10%	70%	80	490	£3	£27	15	420	£1	£22	10	490	£0	£31
	Regulatory Consents	£13	10%	70%	15	90	£1	£7	5	40	£0	£2	1	60	£0	£4
	Agreements	£18	10%	70%	20	120	£1	£9	5	60	£0	£3	2	90	£0	£6
	Management	£88	10%	70%	140	780	£4	£32	30	560	£1	£25	10	570	£0	£36
	Business Services	£53	10%	70%	5	30	£3	£26	1	110	£1	£11	0	80	£0	£5
2. Wind Turbine	Procurement	£1024	15%	15%	1040	1870	£52	£104	210	1440	£10	£83	104	1820	£5	£114
	Transport & Installation	£215	15%	15%	40	60	£12	£25	10	390	£2	£23	4	460	£1	£29
3. Wind Turbine Foundations	Procurement	£254	20%	20%	440	790	£20	£41	90	460	£4	£28	40	690	£2	£43
	Transport & Installation	£159	13%	13%	20	40	£8	£15	5	240	£2	£14	2	280	£1	£18
4. ESI	Onshore Substation	£133	20%	0%	120	90	£10	£10	20	180	£2	£11	10	170	£1	£11
	Onshore Export Cable	£153	20%	20%	210	370	£10	£21	40	290	£2	£17	20	360	£1	£23
	Offshore Substation	£61	20%	0%	50	40	£4	£4	10	90	£1	£5	5	80	£0	£5
	Offshore Export Cables	£154	20%	20%	210	380	£10	£21	40	290	£2	£17	20	370	£1	£23
	Array Cables	£156	20%	20%	210	380	£11	£21	40	290	£2	£17	20	370	£1	£23
5. Marine Operations	Marine Coordination	£12	30%	50%	5	10	£1	£4	1	60	£0	£3	0	70	£0	£4
	Personnel Transport	£37	30%	50%	10	30	£4	£11	3	180	£1	£11	1	210	£0	£13
6. Prepare for Operations	Operating Facilities	£5	30%	50%	21	40	£1	£2	4	30	£0	£1	2	30	£0	£2
Subtotal		£2611	-	-	2640	5610	£168	£407	530	5130	£34	£315	260	6190	£17	£418

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Table 1.2 O&M Impact Assessment

	Total Annual Spend during O&M (£m)	% from Humber LEP	% from Rest of UK	DIRECT				INDIRECT				INDUCED			
				Employment		GVA (£m)		Employment		GVA (£m)		Employment		GVA (£m)	
				Humber LEP	UK	Humber LEP	UK	Humber LEP	UK	Humber LEP	UK	Humber LEP	UK	Humber LEP	UK
WTG O&M	12	75%	20%	100	120	4.0	5.1	20	60	0.8	4.3	10	70	0.4	5.9
BoP (excl. OFTO)	2.5	15%	70%	5	10	0.1	0.7	1	20	0.0	0.6	0	30	0.0	0.8
OFTO	1	15%	70%	0	1	0.0	0.2	0	3	0.0	0.3	0	5	0.0	0.2
Service vessels	6	60%	20%	4	5	1.4	1.8	1	10	0.3	1.7	0	20	0.1	2.1
Jack-up barge	9	2%	22%	0	2	0.1	0.8	0	10	0.0	0.8	0	30	0.0	1.0
Offshore technicians	3.5	75%	15%	03	30	1.2	1.4	6	10	0.2	1.2	3	20	0.1	1.6
WTG components	2.5	10%	10%	1	3	0.1	0.2	0	3	0.0	0.2	0	5	0.0	0.2
Onshore support	1	80%	10%	10	10	0.4	0.4	2	3	0.1	0.3	1	3	0.0	0.5
HSE	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other fees	0.25	10%	85%	0	2	0.0	0.1	0	3	0.0	0.1	0	5	0.0	0.1
Personnel	3	60%	35%	20	30	0.8	1.3	4	20	0.2	0.9	2	30	0.1	1.3
Contingency	6	60%	35%	4	6	0.8	1.3	1	10	0.2	2.1	0	20	0.1	1.0
TCE Rent	4	0%	95%	0	30	0.0	1.7	0	50	0.0	1.2	0	90	0.0	2.0
TNUoS	32	0%	60%	0	20	0.0	4.5	0	80	0.0	7.1	0	130	0.0	3.5
BSUoS	5	0%	80%	0	4	0.0	0.9	0	20	0.0	1.5	0	30	0.0	0.7
Insurance	3	0%	50%	0	2	0.0	0.5	0	10	0.0	0.7	0	20	0.0	0.5
Subtotal	90.75			170	280	9.0	21.1	30	320	1.8	22.8	20	480	0.9	21.3

All figures rounded to nearest 10, except for numbers <10.

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