FOREWIND

DOGGER BANK
TEESSIDE A & B

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Environmental Statement
Chapter 22
Socio-economics

Application Reference: 6.22

Cover photograph: Indicative image showing installation of meteorological mast within the Dogger Bank Zone

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1 Introduction

1.1 Background

1.1.1 This chapter of the Environmental Statement (ES) describes the existing environment with regard to potential socio-economics impacts associated with Dogger Bank Teesside A & B. It takes into account consultation with all relevant stakeholders and assesses the potential impacts during the construction, operation and decommissioning phases. It considers project expenditure and the effect of this upon the local (i.e. Redcar & Cleveland Borough), regional (the wider north east region) and where relevant the national (English) economy. It also considers direct employment (construction and operational workers) and indirect employment (local services employing additional staff) associated with the development, and the effects on the regional employment markets. In addition, the chapter considers employment within the supply chain to take account of the manufacture and fabrication of components including wind turbines and cabling. The approach to socio-economic impact assessment taken in this chapter is consistent with the relevant National Policy Statement (NPS) guidance.

1.1.2 Forewind has not made a decision in relation to ports to be used for construction of the wind farm and associated development and there may not be a single 'base' construction or workers' port. As such, it is not possible to present a meaningful assessment of socio-economic impacts at a named port or ports. Once a construction port has been confirmed, the future developers and operators of the development will work with the port authorities and relevant local authorities to ensure that any effects are adequately understood and measures proposed where appropriate. Potential effects on commercial fisheries are considered separately in **Chapter 15 Commercial Fisheries**; potential tourism and recreation impacts are considered within **Chapter 23 Tourism and Recreation**; and impacts upon local agriculture are considered within **Chapter 26 Land Use and Agriculture**.

2 Guidance and Consultation

2.1 Policy

National Policy Statements

2.1.1 The assessment of potential impacts upon socio-economics has been made with specific reference to the relevant National Policy Statements (NPSs). These are the principal decision making documents for Nationally Significant Infrastructure Projects (NSIP). Those documents relevant to Dogger Bank Teesside A & B are (refer to **Chapter 3 Legislation and Policy** for further information):

- NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c).

2.1.2 The specific assessment requirements pertaining to socio-economics are summarised in **Table 2.1**, together with an indication of where each is addressed within the ES. Where any part of the NPS has not been followed within the assessment an explanation as to why the requirement was not deemed relevant, or has been met in another manner, is provided.

Table 2.1 NPS Assessment Requirements

NPS Requirement	NPS Reference	ES Reference
This assessment should consider all relevant socio-economic impacts, which may include: • The creation of jobs and training opportunities; • The provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities; • Effects on tourism; • The impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development; and • Cumulative effects – if development consent were to be granted to for a number of projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within	EN-1, Paragraph 5.12.3	Relatively small numbers of onshore workers anticipated as the majority of the workforce will be working on the offshore elements. As such, an assessment of the influx of onshore workers has not been undertaken. Job creation and the impacts associated with the construction and operational stages are considered within sections 6 and 7 and cumulative impacts in section 10. Refer also to **Chapter 23 Tourism and Recreation**

NPS Requirement	NPS Reference	ES Reference
the region.		
Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies. Socio-economic impacts may be linked to other impacts, for example the visual impact of a development is considered in Section 5.9 but may also have an impact on tourism and local businesses.	EN-1, Paragraph 5.12.4. & 5.12.5.	Refer to section 4 Baseline Environment of this chapter and **Chapter 23 Tourism and Recreation**

2.1.3 NPS EN-3 and EN-5 do not specifically consider socio-economic effects.

National planning policy

2.1.4 EN-1 states in paragraph 4.1.5 that:

"The energy NPSs have taken account of relevant Planning Policy Statements (PPSs) and older style Planning Policy Guidance Notes (PPGs) in England where appropriate."

2.1.5 The intention appears to be that no specific regard should be given to PPSs or PPGs or any successor policies (unless they are specifically highlighted within the NPS). As such, national planning policy has not been separately reviewed here. There are no references to any other PPSs or PPGs within the assessment criteria for socio-economics, as such, national planning policy has not been separately reviewed here.

Local planning policy

2.1.6 EN-1 states at paragraph 4.1.5 that:

"Other matters that the IPC may consider both important and relevant to its decision-making may include Development Plan Documents or other documents in the Local Development Framework. In the event of a conflict between these or any other documents and an NPS, the NPS prevails for purposes of IPC decision making given the national significance of the infrastructure."

2.1.7 In relation to Dogger Bank Teesside A & B, the existing development plan documents include the following (a summary of the relevant policies from each document is shown in **Table 2.2**):

- Redcar & Cleveland Local Development Framework (LDF) (July, 2005);
- Redcar & Cleveland Core Strategy and Development Policies (2007); and
- Redcar & Cleveland Sustainable Environment Strategy 2006 – 2021 (2006).

2.1.8 Redcar & Cleveland Borough Council (RCBC) published a Regeneration Masterplan in 2012. It is a 15 year plan which will guide regeneration in the area by establishing a framework for new jobs and inwards investment. The Masterplan hopes to facilitate the creation of 14,000 new jobs, the establishment

of 600 new businesses and £4.5 billion in private investment. RCBC intend for the framework to 'play a key role in informing the emerging Local Plan' as well as guiding future development across the Borough.

2.1.9 The emerging Redcar & Cleveland Local Plan is currently under development. A draft of the Local Plan was made available for public consultation between October and December 2013. Whilst not yet adopted, the document includes a number of provisions and policies in support of sustainable development that are relevant to Dogger Bank Teesside A & B. These include support for the development of renewable energy infrastructure, the focus this provides to securing inward investment, the importance of critical infrastructure and the Council's presumption in favour of sustainable development.

Table 2.2 Relevant policies from Development Plan documents

Document	Policy/Guideline	Policy/Guideline purpose
Redcar & Cleveland Core Strategy and Development Policies (2007)	CS11 Innovation and New Technologies	Proposals will be supported that strengthen the development of the Borough as a centre for energy and recycling industries. Such development will be centred at Wilton International and the wider South Tees area. Kirkleatham Business Park, Redcar & Cleveland Gate Business Park, Guisborough will be promoted for information and technology based businesses incorporating high quality building design and attractive environments.

2.2 Consultation

2.2.1 To inform the ES, Forewind has undertaken a thorough pre-application consultation process, including the following key stages:

- Scoping Report submitted to the Planning Inspectorate (May 2012);
- Scoping Opinion received from the Planning Inspectorate (June 2012);
- First stage of statutory consultation (in accordance with sections 42 and 47 of the Planning Act 2008) on Preliminary Environmental Information (PEI) 1 (report published May 2012); and
- Second stage of statutory consultation (in accordance with sections 42, 47 and 48 of the Planning Act 2008) on the ES (published November 2013) designed to allow for comments before final application to the Planning Inspectorate).

2.2.2 In addition, consultation associated with the Dogger Bank Creyke Beck application (Forewind August 2013) has been taken into account for Dogger Bank Teesside A & B where appropriate.

2.2.3 In between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals. Consultation undertaken throughout the pre-application development phase has informed Forewind's design decision making and the information presented in this application. Further information on the consultation process is presented in

Chapter 7 Consultation. A Consultation Report is also provided alongside this ES as part of the overall planning submission.

2.2.4 A summary of the consultation carried out at key stages throughout the project, of particular relevance to Socioeconomics, is presented in **Table 2.3**. This table only includes the key items of consultation that have defined the assessment. A considerable number of comments, issues and concerns raised during consultation have been addressed during consultation meetings and hence have not resulted in changes to the content of the ES. In these cases, the issue in question has not been captured in **Table 2.3**. A full explanation of how the consultation process has shaped the ES, as well as tables of all responses received during the statutory consultation periods, is provided in the Consultation Report.

Table 2.3 Consultation responses of key stakeholders

Date	Consultee	Comment	ES Reference
June 2012 (Scoping, Statutory)	Planning Inspectorate	The potential impacts listed in the Scoping Report relate to positive impacts. The assessment must also assess any negative socio-economic effects that may arise, including the impacts upon the commercial fishing and tourism and recreation.	Impacts upon fisheries are discussed in full in Chapter 15 Commercial Fisheries and Chapter 23 Tourism and Recreation
		The Secretary of State recommends that the assessment considers the potential significance of the impacts of the proposal within a local context, and a regional context beyond that of the administrative boundary in which the project is located. The types and number of jobs generated should be considered in the context of the available workforce in the area. Information should be provided on worker accommodation and include an assessment of the potential impacts of the influx of workers. The cumulative impact of workers on nearby major projects should be assessed. The Applicant is referred to the comments provided by Scarborough Borough Council (refer to Appendix 2 of this Opinion).	The available workforce of the Redcar & Cleveland Borough and the North East of England region is described in section 4.3. Forewind has not made a decision in relation to ports to be used for construction of the wind farm. As such, it is not possible to present a meaningful assessment of socio-economic impacts of the influx of workers at a named port town. Once a construction port has been confirmed, the future developers and operations of the development will work with the port authority and relevant local authority to ensure that any effects are adequately understood and measures proposed where relevant

Date	Consultee	Comment	ES Reference
June 2012 (Scoping, Statutory)	Scarborough Borough Council	The administrative area of Scarborough Borough is immediately adjacent to the study area, [and] includes the ports of Whitby and Scarborough as well as large areas of the North Yorkshire Moors National Park. Scarborough Borough Council therefore considers that the socioeconomic impact of the development as it affects the Borough should also be assessed both during construction and subsequent operation. The Council considers that the Recreational and Tourist impact on the Borough should also be included and that such impacts on the North Yorkshire Moors National Park should not be scoped out. The Moors provide a significant asset for Teesside and many Teesside residents and visitors use it for recreational and tourism. The 5km distance from the study area is not considered a sufficient reason to exclude these impacts from the assessment.	Refer to Chapter 23 Tourism and Recreation
January 2013 (Non-statutory)	RCBC	RCBC agree the methodology is acceptable and addresses the key assessment criteria.	Refer to Chapter 23 Tourism and Recreation and Chapter 7 Consultation
September 2013 (Non-statutory)	RCBC	Satisfied with methodology and approach to assessment, along with assessment findings. RCBC are in support of the project however would like to see some further local labour benefits derived where possible from the scheme.	Refer to Chapter 23 Tourism and Recreation and Chapter 7 Consultation
November 2013 (ES - statutory	RCBC	Further information is requested that provides additional detail on anticipated port location(s) and job creation/new training and skills opportunities.	A separate response is being provided to RCBC by Forewind that specifically addresses the points raised. A summary of the response will be included in the Consultation Report.

3 Methodology

3.1 Study area

3.1.1 In order to establish a sound socio-economic baseline for Dogger Bank Teesside A & B, the North East England region has been used as a meaningful economic unit for the assessment of potential impacts. Using this region as the socio-economic baseline is considered to represent a realistic scenario, whilst at the same time recognising that economic benefits from the project may be realised across the UK.

3.1.2 Data for the Borough of Redcar & Cleveland is also provided, where available, but this is only to provide context to the regional and UK numbers. This is relevant to the assessment, and should aid understanding of the figures presented, as the onshore elements of the project are wholly within the Borough of Redcar & Cleveland.

3.1.3 Consequently, the tables presented in Section 4 may show figures at the local (Borough), regional and national level, depending on the relevance and availability of data.

3.2 Characterisation of existing environment

3.2.1 Characterisation of the existing environment has been informed through a desk based study of available data, and information from the consultation process. The following sources of information have been used:

- Nomis – Official labour market statistics;
- Neighbourhood Statistics – Office for National Statistics;
- Local Development Frameworks for the north east of England;
- The Crown Estate (2010). A Guide to an Offshore Windfarm;
- The Crown Estate (2009). BWEA (now Renewable UK) Towards Round 3: Building the Offshore Wind Supply Chain;
- Greenpeace (2004). Energy for Sustainable Development. Offshore wind, onshore jobs, - A new industry for Britain;
- Redcar & Cleveland Local Development Framework;
- Rural Strategy for East Cleveland;
- Regional Economic Strategy for the North East;
- One North East, Countryside Agency, North East Assembly; and
- Tees Valley Unlimited.

3.3 Assessment of impacts

3.3.1 This assessment is based on existing studies which have determined the supply chain and the economic effects of wind farm developments, as well as the approaches presented within other major infrastructure Environmental Impact

Assessments (EIA). Key documents that have informed the approach are detailed below.

- POWER – Transnational Offshore Wind Supply Chain Study, (Douglas-Westwood 2007);
- UK Offshore Wind: Moving Up a Gear (BWEA 2007);
- Wind Energy in the UK: A BWEA State of the Industry Report (BWEA 2008);
- UK Offshore Energy Strategic Environmental Assessment (DECC 2009);
- Hinkley Point C Environmental Statement (EDF Energy 2011);
- Galloper Offshore Wind Farm Environmental Statement (Galloper Wind Farm Ltd 2011); and
- RWE Power Renewables, Triton Knoll Offshore Wind Farm Environmental Statement (RWE 2012).

3.4 Magnitude of effect and impact significance

3.4.1 There is no single set of recognised standards for the assessment of socio-economic impacts. Consequently, a relevant set of 'states of local society' standards against which anticipated impacts of a development can be assessed are not available. A reduction in local unemployment, for example, would likely be regarded as positive whilst an increase in local crime would be viewed as negative, but there are no absolute standards. In light of this, this chapter presents qualitative assessment of the anticipated impacts and benefits, their extent and when they are expected to occur. This approach has been agreed with RCBC in January 2013 as presented in **Table 2.3**.

4 Existing Environment

4.1 Introduction

4.1.1 This section considers information on various indicators from a range of sources to provide a relevant baseline for the socio-economic impact assessment. It starts by considering the existing policy framework within which the socio economic assessment is undertaken; considering all relevant policy documents related to social and economic impacts from major renewables infrastructure. It goes on to provide an overview of the baseline region (North East England) before considering indicators at the local (borough council) scale. The baseline provides regional and where relevant / available, local and national level data on:

- Population and population change;
- Employment characteristics and change;
- Economic activity and wealth creation; and
- Unemployment.

4.1.2 Other socio-economic impacts relating to commercial fisheries, tourism and recreation, and land use and agriculture are dealt with in full in their respective chapters (refer also to Section 9 of this chapter - Inter-relationships).

4.2 Policy context

Introduction

4.2.1 Forewind recognises that socio-economic impacts for the Dogger Bank Teesside A & B projects are set within the regional and national policy framework for energy and energy infrastructure. As such, in defining the context for the socio-economic assessment it is relevant to reiterate the Government's commitment to renewable energy and the mechanism by which NSIPs are assessed.

4.2.2 For more details on the Government's commitment to renewable energy refer to **Chapter 2 Project Need**, and for details of the actual NPS assessment requirements refer to Section 2 of this chapter.

Policy

4.2.3 The Government has stated in the National Renewable Energy Action Plan for the UK (DECC 2010) that:

"*Our drive to increase the proportion of energy we obtain from renewable sources will not only increase the security of energy supplies in the UK; it will also provide opportunities for investment in new industries and new technologies*."

4.2.4 The Government is seeking to help business develop in this area to put the UK at the forefront of new renewable technologies and skills.

4.2.5 Through the Offshore Energy Strategic Environmental Assessment (SEA) 2009 process, the Government has assessed the environmental implications and spatial interactions of some 25 GW of new offshore wind capacity, on top of existing plans for 8 GW of offshore wind. The Offshore Energy SEA Environmental Report notes that making efficient use of the UK's own energy reserves brings obvious benefits, both in the contribution it can make to a diverse UK energy mix, and to the economy in terms of jobs, investment and national income generated by the sector (DECC 2009).

4.2.6 The Government's Renewable Energy Roadmap (DECC 2011d) sets out a comprehensive action plan to accelerate the UK's deployment and use of renewable energy so as to meet 2020 targets. The Roadmap states that:

"Renewable energy already employs more than a quarter of a million people; by 2020, it could be over half a million. The creation of jobs in the renewable energy sector, investment in new manufacturing capability, and the consequent direct and indirect benefits will support transition to a green economy."

4.2.7 DECC and the devolved administrations have already begun to fund initiatives to strengthen port and manufacturing facilities and supply chain provision for manufacturing offshore wind turbines and related components (DECC is committing £60m of support between now and 2015, and the Scottish Government £70m). The Scottish Government estimates that its funding alone will leverage significant private sector investment and help deliver an estimated 28,000 jobs and £7.1 billion in value to Scotland's economy over the coming decade.

4.2.8 The UK Government has set out a strategy to maintain the UK's lead in offshore wind and match it with a corresponding industrial policy; the ambition is to ensure the UK captures the economic, as well as energy security benefits of this low carbon industry. As part of this strategy the Government has established Centres for Offshore Renewable Engineering (COREs), to support the development of the necessary infrastructure to allow the industry to grow (Department for Business, Innovation & Skills 2011). Five strategic locations have been chosen to prioritise development of the sector, including: Hull and adjacent parts of the East Riding, South Humber Bank; Teesside; and Tyneside. In these locations (Humber, Tees and Tyne), offshore renewables projects will form part of an enterprise zone development strategy and will benefit from enhanced capital allowances.

4.2.9 The Department for Business, Innovation & Skills (2011) notes that these areas offer the right infrastructure for offshore wind manufacturing, access to a skilled workforce, an experienced local supply chain, and access to excellent Research and Development facilities. The COREs are partnerships between Central and Local Government and Local Economic Partnerships (LEPs) that ensure businesses looking to invest in manufacturing for the offshore renewables industry receive the most comprehensive support possible.

4.2.10 In an update to the Roadmap (DECC 2012a), the Government notes that renewable energy is supporting jobs and investment in the UK throughout the supply chain; stating that:

"Sources indicate that the Renewables sector (covering electricity, heat and transport) currently supports around 110,000 jobs directly and in immediate supply chains, with around 160,000 jobs supported further along the supply chain. By 2020, the sector could support around 400,000 direct and immediate supply chain jobs and many more further along supply chains. In advanced engineering and environmental technology sectors, renewable energy represented the largest source of inward investment projects in 2011/12."

4.2.11 Between April 2011 and July 2012, DECC collated renewable industry announcements totalling around £12.7bn of confirmed and planned investments, with the potential support of around 22,800 jobs, bringing economic growth to every part of the country.

4.2.12 This growth includes a reported £2.7bn of renewables investment in the Yorkshire region with the expected creation of 5,700 jobs, and a further £727m of renewables investment in the North East region, expected to generate over 2000 jobs (DECC 2012b).

4.2.13 Offshore wind developers have stated a vision for a minimum of 50% 'UK content'; i.e. that 50% of the total spend associated with the wind farm is spent in the UK. Industry is working in partnership with DECC and the Department for Business, Innovation and Skills to make this vision a reality. UK Government also intends to establish a strategic partnership with industry to have real impact on economic growth. The strategy aims to promote innovation, investment and economic growth in the UK-based supply chain for offshore wind.

4.2.14 The Planning Act (as amended by the Localism Act 2011) sets out special measures for NSIP, with the Secretary of State at DECC responsible for decisions on energy applications. In July 2011, Parliament debated and approved the six NPSs. The energy NPSs set out national policy against which proposals for major energy projects are assessed. The Planning Inspectorate will use NPSs in its examination of applications for development consent, and Ministers will use them when making decisions. The relevant energy NPSs:

- Overarching (NPS) for Energy (EN-1) (DECC 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Network Infrastructure (EN-5) (DECC 2011c).

4.2.15 EN-1 covers the high level objectives, policy and regulatory framework for new NSIP. This includes the need and urgency for new energy infrastructure to be consented and built to ensure secure, diverse and affordable energy supplies that support the Government's policies on sustainable development, in particular measures to address climate change. It also sets out the need for specific technologies, including renewable energy.

4.2.16 EN-1 states the following:

"The UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions.

The [Planning Inspectorate] should therefore assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them in [EN-1].

The [Planning Inspectorate] should give substantial weight to the contribution which projects would make towards satisfying this need when considering applications for development consent under the Planning Act 2008."

4.2.17 EN-1 reiterates that the UK has committed to sourcing 15% of its total energy (across the sectors of transport, electricity and heat) from renewable sources by 2020 and new projects need to continue to come forward urgently to ensure that the target is met. It notes that large scale deployment of renewables will help the UK to tackle climate change, potentially reducing the UK's emissions of carbon dioxide by over 750 million tonnes by 2030. It also notes that deployment will also deliver up to half a million jobs by 2020 in the renewables sector. EN-1 states that offshore wind is expected to provide the largest single contribution towards the 2020 renewable energy generation targets.

4.2.18 The NPS recognises that the construction, operation and decommissioning of energy infrastructure may have socio-economic impacts and sets out some of the national level impacts. Government policy states that the planning decision should have regard to the potential socio-economic impacts of new energy infrastructure identified by the applicant and from any other sources that the Planning Inspectorate considers to be both relevant and important to its decision, which includes the case already made in the NPSs.

4.3 The North East England region

4.3.1 The regional context in this socio-economic assessment is provided by North East England; it is the area within which some, potentially large, proportions of the overall project spend will take place. It is also the area within which supporting infrastructure (including the onshore cable connection), and much of the related project management work will be taking place.

4.3.2 The North East region of England is the smallest of England's nine administrative regions in terms of population (2.6 million) and, with the exception of London, is the smallest geographically (22,274 km^2). Over 80% of the population live in urban areas with the two main centres of population grouped around the three main rivers in the region (Office for National Statistics, 2010). In the north of the region Newcastle upon Tyne (population 274,000) and Gateshead (population 280,000) straddle the River Tyne while Sunderland (population 280,000) lies on the River Wear. In the south of the region the River Tees flows through Middlesbrough (population 139,000) and Stockton-on-Tees (population 192,000) (Office for National Statistics 2010). These urban areas

are bounded by the Cheviot Hills to the north, the Pennines to the west, to the east by the North Sea and to the south by the Cleveland Hills and the North Yorkshire Moors.

4.3.3 The economy is supported by a variety of transport links. These include direct links to the motorway network via the north-south running A1(M), and the A69 which connects Newcastle upon Tyne with Carlisle in the West. The A19 links Middlesbrough with Sunderland, Gateshead, Newcastle (to the north) and York (to the south). The region is easily accessible by train with the East Coast mainline having a stop at Darlington. North East England has two international airports: Newcastle and Durham Tees Valley. There is also a ferry service from Newcastle upon Tyne to Amsterdam (Ijmuiden, the Netherlands) (Office for National Statistics 2010).

4.3.4 Tourist attractions in the North East include, in no particular order, Alnwick Castle and its gardens, the Angel of the North, Hadrian's Wall, Lindisfarne (Holy Island), Bamburgh Castle, Beamish Open Air Museum, the Bowes Museum, the Baltic Centre for Contemporary Art, Middlesbrough's Institute of Modern Art and numerous other art galleries and museums (Office for National Statistics 2010).

4.3.5 In 2007, 17% of the region's Gross Value Added (GVA) was from manufacturing; higher than the UK average of 13%. Productivity in 2010 (measured by GVA per hour worked) was 88% of the UK rate, which is one of the lowest of the English regions (Office for National Statistics 2012). North East England has the highest value of goods exports relative to the size of its economy of all the English regions. The Region's export of goods (expressed as a % of GVA) is, at 29%, high compared to other English regions and the UK average of 20%. Over half of all goods exported from the region are destined for the European Union (Office for National Statistics 2012).

4.3.6 The public sector plays an important role in the economy of North East England, accounting for 24.8% of the workforce and 59% of the GDP (2011-2012). This compares with national averages of 19.9% and 40% respectively (2011-2012) (Office for National Statistics 2012).

4.3.7 The data available illustrates that the GVA across North East England for 2012 was estimated to be approximately £42bn which is a 1.7% growth compared to 2011 (see **Table 4.1**).

Table 4.1 GVA for the North East region

	Output in £m				% Growth 2010 v 2009	& Growth 2011 v 2010	% Growth 2012 v 2011
	2009	2010	2011	2012			
North East England	40,369	41,038	41,598	41,874	3.8	2.4	1.7

Source: Regional, sub-regional and local gross value added 2009 to 2012, (ONS website accessed January 2014)

4.4 The Borough of Redcar & Cleveland

4.4.1 The local economic area for the purposes of this assessment is the Borough of Redcar & Cleveland, within which the onshore cable route will be wholly contained, and provides some context to the regional economy values. Redcar & Cleveland is one of four unitary authority boroughs that were created following the break-up of the county of Cleveland in 1996. The Borough forms part of the Tees Valley economic area. It is an area that has historically, and continues to be today, dominated by heavy industry. Throughout the Tees Valley there is widespread social and economic deprivation with nearby Middlesbrough containing some of the most deprived areas in England (Department of Health 2012).

4.4.2 The Borough is bound by the North Sea to the east whilst to the west the boundary lies just north of Great Ayton and meets the Middlesbrough conurbation along that town's western boundary. It is the southernmost borough in the North East region, and stretches from the River Tees to Cowbar, just north of Staithes. Redcar & Cleveland covers an area of 24,490 hectares (214km^2) and is the largest of the Tees Valley Boroughs (RCBC 2006).

4.4.3 The Borough comprises a number of coastal settlements, historic market towns like Guisborough and a large heavy industry complex along the south bank of the River Tees. Such industrial sites include the Wilton International site, owned and managed by Sembcorp, employing over 8,000 people and promoting high quality development opportunities for the renewables, power and chemical industries. The site features an enterprise zone (focussing on the renewable, energy and chemical industries) and extensive infrastructure facilitating the efficient start-up of new businesses. The decline in heavy industries in the 1970s left its mark on Teesside, with an estimated 25,000 jobs existing on the Wilton site at its peak in the 1960s. Household names such as ICI, whose manufacturing hub was located in Teesside, provided large numbers of jobs and although the industry is a major employer in the area today, overall numbers in employment have fallen. The enterprise zone established on the Wilton site provides attractive financial and planning-related incentives for prospective employers.

4.4.4 The location of the construction port will not be known for some time, but the extensive sea port of Teesport, located within Redcar & Cleveland Borough, offers a realistic potential shore base for the offshore construction works and ongoing maintenance needs for Dogger Bank Teesside A & B. The port is one of a number along the coast of North East England which would offer favourable travel times to and from the project area, as well as having significant existing infrastructure to facilitate the establishment and operation of an onshore support base. In addition, a comprehensive pool of expertise supporting the offshore renewables industry exists in and around Teesside.

4.5 Population and employment

4.5.1 The largest town in Redcar & Cleveland is Redcar which has a population of 36,000 (RCBC 2007). **Table 4.2** summarises the North East England and Redcar & Cleveland Borough populations.

Table 4.2 Population comparison for the North East of England region and Redcar & Cleveland Borough

Total resident population	North East England	Redcar & Cleveland Borough
All people	2,602,300*	135,000*
Males (all ages)	1,273,300*	65,600*
Females (all ages)	1,329,000*	69,400*
All people (aged 16-64)	1,699,700	86,300
Males (aged 16-64)	847,800	42,200
Females (aged 16-64)	851,800	44,100

Source: Nomis, Office for National Statistics (website, accessed January 2014). * indicates that this data is more recent (2012 figures) than the bottom 3 rows (2011 census data).

4.5.2 In North East England, 17% of people are employed in manufacturing whilst just over 16% are employed in wholesale and retail trade and repairs. This trend is similar in Redcar & Cleveland, where the largest employment sector is manufacturing (just under 19% of jobs) followed by wholesale and retail trade and repairs (16% of jobs) (Nomis website accessed October 2012).

4.5.3 **Table 4.3** illustrates the number of people employed by industry type within North East England and Redcar & Cleveland Borough. This data is taken from the 2001 census information (2011 census data was not available at the time of writing).

Table 4.3 Comparison of employment by industry for North East England and Redcar & Cleveland

Employment industry	North East England		Redcar & Cleveland Borough	
All people (aged 16-64 in employment)	1,032,968		54,295	
	Total	%	Total	%
Agriculture, hunting and forestry, fishing	12,060	1.17	559	1.03
Mining and quarrying, electricity, gas and water supply	16,223	1.58	1,521	2.83
Manufacturing	175,491	17.00	10,215	18.81
Construction	75,582	7.32	4,542	8.37

Employment industry	North East England		Redcar & Cleveland Borough	
Wholesale and retail trade, repairs	167,222	16.20	8,702	16.03
Hotels and restaurants	52,706	5.11	2,637	4.86
Transport, storage and communications	69,851	6.77	3,328	6.13
Financial intermediation	31,416	3.04	1,144	2.11
Real estate, renting and business activities	94,590	9.16	5,001	9.21
Public administration and defence, social security	76,789	7.43	3,192	5.88
Education	82,872	8.02	4,455	8.21
Health and social work	131,613	12.74	6,674	12.29
Other	46,041	4.46	2,302	4.24

Source: Neighbourhood Statistics, Office for National Statistics (website, accessed January 2014)

4.5.4 **Table 4.4** illustrates the number of people employed by profession within the North East of England region and Redcar & Cleveland Borough. Professional occupations comprise the largest number of jobs (17.1% of the total workforce in Redcar & Cleveland Borough) followed by skilled trades occupations (14.2%).

Table 4.4 Employment by profession; a comparison of regional and local figures for the period October 2012 – September 2013

Employment industry	North East England – proportion of all persons in employment (%)	Redcar & Cleveland Borough – proportion of all persons in employment (%)
Managers and senior officials	8.3	6.9
Professional occupations	16.9	17.1
Associate professional and technical	12.4	9.9
Administrative and secretarial	12.0	11.3
Skilled trades occupations	11.5	14.2
Caring, leisure and other service occupations	9.4	13.3
Sales and customer service	9.9	7.2
Process plant and machine operatives	7.1	8.9

Employment industry	North East England – proportion of all persons in employment (%)	Redcar & Cleveland Borough – proportion of all persons in employment (%)
Elementary occupations	11.3	10.1

Source: Nomis, Office for National Statistics (website, accessed January 2014)

4.5.5 In the context of Great Britain and North East of England, employment rates within Redcar & Cleveland Borough are relatively low with 63.8% of all people in employment, compared to the UK average of 71.2% (Nomis, Office for National Statistics figures for January to December 2012). **Table 4.5** details the number of economically active, self employed and unemployed people in the Borough of Redcar & Cleveland, the North East of England region and nationally.

Table 4.5 Employment and unemployment numbers (October 2012 – September 2013)

Type	North East England (%) (aged 16-64)	Redcar & Cleveland Borough (%) (aged 16-64)	Great Britain (%)
All people			
Economically active	74.0	73.8	77.4
In employment	66.2	63.8	71.2
Employees	58.9	57.0	61.1
Self employed	6.6	6.3	9.5
Unemployed (model-based)	10.3	No data available	7.7
Males			
Economically active	79.3	77.6	83.2
In employment	70.1	67.6	76.2
Employees	59.9	60.0	62.5
Self employed	9.3	7.0	13.1
Unemployed	11.4	12.6	8.2
Females			
Economically active	68.8	70.1	71.5
In employment	62.5	60.2	66.2
Employees	57.8	54.2	59.7
Self employed	4.1	5.6	6.0
Unemployed	9.1	14.0	7.2

Source: Nomis, Office for National Statistics (website, accessed January 2014)

4.6 Education

4.6.1 Educational attainment across the North East region is mirrored by the figures for Redcar & Cleveland Borough, with both being below the Great Britain average across all categories. In 2012, 26.9% of adults in North East England were qualified to National Vocational Qualification1 (NVQ) level 4 and above, 49.8% to NVQ level 3 and above and 68.7% were qualified to NVQ Level 2 and above. These figures compare to the UK (national) averages of 34.4%, 55.1% and 71.8% respectively. The figures for Redcar & Cleveland are slightly lower than the regional figures, reflecting lower educational attainment and higher levels of unemployment. Table 4.6 sets out these figures, with both numbers and percentages representing people aged between 16 and 64. Percentages are a proportion of the resident population within this age.

Table 4.6 Educational qualifications and attainment at the regional, local and national levels (January – December 2012)

Qualification	North East England (%)	Redcar & Cleveland Borough (%)	Great Britain (%)
NVQ4 and above	26.9	25.9	34.4
NVQ3 and above	49.8	48.8	55.1
NVQ2 and above	68.7	67.5	71.8
NVQ1 and above	82.9	81.0	84.0
Other qualifications	5.2	5.9	6.3
No qualifications	11.8	13.0	9.7

Source: Nomis, Official labour market statistics (website accessed January 2014)

4.7 Earnings by residents

4.7.1 Weekly earnings in Redcar & Cleveland Borough are lower overall than the average for North East England as detailed in **Table 4.7**.

Table 4.7 Comparison of earning by residents (2013)

	North East England (gross weekly pay - £)	Redcar & Cleveland Borough average (gross weekly pay - £)
Full time workers	472.3	439.2*
Male full-time workers	506.3	479.5*
Female full-time workers	421.9	390.3*

Source: Nomis, Office for National Statistics (website accessed January 2014). * indicates that this is 2012 data as 2013 figures not currently available.

[1] National Vocational Qualifications are word based awards in England, Wales and Northern Ireland that are achieved through assessment and training. There are five levels of NVQ ranging from Level 1, which focuses on basic work activities, to Level 5 for senior management.

4.8 Offshore renewable job creation

4.8.1 The UK offshore wind energy market is considered to have significant potential to create new jobs in the UK with the majority created in manufacturing and installation. RenewableUK reported in their Working for a Green Britain report (RenewableUK 2011) that the wind and marine energy industry currently directly employs approximately 10,600 full-time equivalent employees. Despite ongoing national and global financial problems, the industry within the UK has seen significant growth and a substantial number of new jobs have been created over the past five years. The future of offshore wind and the associated job creation opportunities is dependent upon a wide range of factors; national and international economics and politics being two such examples. The realisation of the full potential of these opportunities is clearly dependent upon the adoption of effective legislation and policy provision.

4.8.2 Numerous projections and forecasts set out a range of scenarios for future industry growth. **Table 4.8** provides details of the future job creation projections associated with the offshore wind sector presented as full time equivalent (FTE) jobs. The data is drawn from the report 'Working for a Green Britain Volume 2: Future Employment and Skills in the UK Wind & Marine Energy Industries' prepared by RenewableUK (2011). The report is informed by secondary Government data, input from independent consultants and other RenewableUK reports.

Table 4.8 Potential job creation within the wind energy sector to 2021

Scenario	Direct employment		Indirect employment		TOTAL	
	FTE jobs	FTE jobs per MW	FTE jobs	FTE jobs per MW	FTE jobs	FTE jobs per MW
Low – 13 GigaWatts by 2021	11,800	0.91	6,400	0.49	18,200	1.4
Medium – 23 GigaWatts by 2021	29,700	1.29	17,500	0.76	47,200	2.05
High – 31 GigaWatts by 2021	42,400	1.37	25,300	0.82	67,700	2.18

Source: RenewableUK (2011)

4.8.3 In addition, Oxford Economics produced a report in 2010 specifically considering projections for operations and maintenance workers, and forecasts against a range of scenarios for future industry growth. **Table 4.9** provides details of the future operations and maintenance job creation projections associated with the offshore wind sector.

Table 4.9 UK offshore operations and maintenance workforce predictions to 2020

Scenario	Direct employment		Indirect employment		TOTAL	
	FTE jobs	FTE jobs per MW	FTE jobs	FTE jobs per MW	FTE jobs	FTE jobs per MW
Low – 14.1 GigaWatts by 2020	2,500	0.18	2,110	0.15	4,610	0.33
Medium – 20.5 GigaWatts by 2020	4,000	0.20	3,230	0.16	7,230	0.35
High – 47.5 GigaWatts by 2020	11,720	0.25	8,400	0.18	20,120	0.42

Source: Oxford Economics (2010)

4.9 Offshore renewables supply chain

4.9.1 With an international supply chain supporting the offshore wind industry, much of the procurement and supply network is based in continental Europe, where a full and highly advanced (particularly when considered in relation to that based in the UK-based) supply chain is available.

4.9.2 The outlook for job creation in the offshore renewables supply chain in the UK is positive. The Centre for Economics and Business Research published a study in June 2012 'The Macroeconomic Benefits of Investment in Offshore Wind', which forecast the creation of up to 97,000 jobs by 2020 in the UK related to the offshore wind industry. The 2012 State of the Industry report for the UK wind industry (RenewableUK 2012) estimated that wind developments for the 2011/12 period resulted in the spending of between £150 million and £600 million in the UK.

4.9.3 The wind turbine supply chain is expanding within the UK in line with demand, and opportunities exist for new suppliers of equipment and services to enter the sector. A number of the leading wind turbine manufacturers are planning to open factories within the UK. Ports in the Tees Valley have been supporting the offshore wind industry for a number of years through vessel support, training services and component manufacture. In addition, the following industries and suppliers are present in, or close to, the North East and are well positioned to support the construction of Dogger Bank Teesside A & B:

- Tees Alliance Group manufacture steel wind turbine tower foundations, offshore substations and accommodation modules from their facility alongside the River Tees in Billingham (TAG Energy Solutions 2013);
- JDR manufacturing produces inter-array cables for the offshore renewables industry and is investing £11m in expanding its Hartlepool facility to help it meet current and expected demand (JDR Global 2013);

- DeepOcean, with an operating base on Teesport, provide a wide range of services to the offshore industry through seafloor surveying, cable-laying, sub-surface inspection, maintenance and installation (DeepOcean 2013);
- MPI Offshore, based south of Middlesbrough in Stokesley, is provides support to the offshore renewables industry, specialising in the installation of offshore wind turbines (MPI Offshore 2013);
- Able Humber Port is another development which aims to help support the expanding North Sea offshore wind industry. This £450M development was given final approval by the Secretary of State in December 2013 and will comprise a Logistics, Business and Marine Energy Park. It also incorporates the construction of new quays as part of an assembly and installation base on the south banks of the Humber estuary supporting offshore renewable projects. The project has the potential to create in excess of 4,000 jobs with additional, related development anticipated in partnership with European renewables suppliers(Able Humber Port, RenewableUK 2012);
- Green Port Hull is a Hull City Council approved development whereby turbine manufacturer Siemens plans to build a factory producing wind farm equipment and associated developments at Alexandra Dock. It is anticipated that around 700 new jobs will be created as a result of this project (Green Port Hull 2012); and
- Wind energy developer Areva also announced in early 2012 their desire to establish a manufacturing site in Scotland to support the continued growth of the industry in the North Sea.

4.9.4 In addition, there is a broad range of organisations providing training and skills for the offshore energy industry, located in and around Teesside. Falck Safety Services, with a base near Teesport, are one of the world's largest providers of safety and training services to the offshore industry. South Shields College has a Marine Safety Training Centre which offers a range of specialist courses for those in or training for careers in the marine and offshore sector. These and other providers highlight the strong support and knowledge base that exists in the local area related to the offshore renewables industry.

4.9.5 There is strong political pressure to develop offshore wind energy as quickly as possible to meet the 2020 renewable energy targets. As such, generation companies across the EU are competing for limited supply chain resources. A substantial number of UK companies currently involved in the offshore wind supply chain are based along or in proximity to England's North Sea coast, as a result of the numerous offshore wind farms proposed along the east coast/north sea region.

5 Assessment of Impacts – Worst Case Definition

5.1 Introduction

5.1.1 This section establishes the realistic worst case (actually representing the most conservative positive impact) scenario for each category of impact as a basis for the subsequent impact assessment. This involves both a consideration of the relative timing and phasing of construction and operation of the two projects, as well as the particular design parameters of each project that define the Rochdale Envelope[2] for this particular assessment.

5.1.2 Full details of the range of development options being considered by Forewind are provided within **Chapter 5 Project Description**. For the purpose of the socio-economic impact assessment, the key project parameters which form the realistic worst case are set out in **Table 5.3**.

5.1.3 Only those design parameters with the potential to influence the level of impact are identified.

5.1.4 The realistic worst case scenarios identified here are also applied to the Cumulative Impact Assessment (see Section 10) and summarised in **Chapter 33 Cumulative Impact Assessment**.

5.2 Construction scenarios

5.2.1 **Chapter 5** provides details of the three overarching construction scenarios associated with the construction of Dogger Bank Teesside A & B.

5.2.2 The specific timing of construction of the two projects will be determined post consent and therefore a Rochdale Envelope approach has been undertaken for the EIA. There are four key principles that form the basis of the Rochdale Envelope, relating to how the projects will be built. These are:

- Both projects may be constructed at the same time, or at different times;
- If built at different times, either project could be built first (subject to consent period);
- If built at different times, the duration of the gap between the end of the first project to be built, and the start of the second project to be built may vary from overlapping, to up to five years; and
- Partial installation of elements of the second project may be completed during the construction of the first project, e.g. through the use of ducts to provide conduits for a later cable installation.

[2] As described in **Chapter 5** the term 'Rochdale Envelope' refers to case law (R.V. Rochdale MBC Ex Part C Tew 1999 "the Rochdale case"). The 'Rochdale Envelope' for a project outlines the realistic worst case scenario or option for each individual impact, so that it can be safely assumed that all lesser options will have less impact.

5.2.3 To determine which construction scenario is the realistic worst case for a given receptor two types of effect exist with the potential to cause a maximum level of impact on a given receptor:

- Maximum *duration* effects; and
- Maximum *peak* effects.

5.2.4 To ensure that the Rochdale Envelope incorporates the three overarching onshore construction scenarios (as outlined in **Chapter 5**), both the maximum duration effects and the maximum peak effects are assessed for each onshore receptor.

5.2.5 Furthermore, the option to construct each project in isolation is also considered ('Build A in isolation' and 'Build B in isolation'), enabling the assessment to identify any differences between the two projects. The four construction scenarios for Dogger Bank Teesside A & B considered within the onshore assessment for socio-economics are therefore:

i. Build A or Build B in isolation;

ii. Build A and B concurrently – provides the worst 'peak' impact and maximum working footprint;

iii. Build A, gap of up to five years, Build B (sequential) – provides the worst 'duration' of impact; and

iv. Build A and install conduits for B, gap of up to five years, install cables for B in conduits (onshore).

5.2.6 For the single project scenario (i) either project is considered to have the same impact on socio-economic receptors, and so a single assessment is presented (rather than separate assessments for A & B).

5.2.7 For the two project scenarios (ii to iv) there is no material difference between them in terms of socio-economic impacts. The relevant factor is simply that there will be a doubling of the potential workforce and project expenditure. As such a single assessment is presented for the two project scenario and is considered representative for scenarios (ii to iv).

5.2.8 Thus, the construction scenarios presented within the impact assessment section of this chapter (starting with Section 6) are:

- Single project; and
- Two projects.

Workforce numbers (construction)

5.2.9 Using the employment projections presented in **Table 4.8,** the range of FTE jobs associated with the construction of Dogger Bank Teesside A or B are presented in **Table 5.1**. Direct employment refers to those jobs which are specifically involved with the construction of Dogger Bank Teesside A & B. Indirect employment refers to those new jobs that may be created in the production, supply and support chains as utilised by those direct employees.

Table 5.1 Full time equivalent jobs predicted for the construction of a single project

Scenario	Direct employment	Indirect employment	TOTAL	
	FTE jobs	FTE jobs	FTE jobs	FTE jobs per MW installed
Low – 13 GigaWatts by 2021	1,092	588	1,680	1.4
Medium – 23 GigaWatts by 2021	1,548	912	2,460	2.05
High – 31 GigaWatts by 2021	1,644	984	2,628	2.18

Workforce numbers (operation and maintenance)

5.2.10 Using the employment projections presented in **Table 4.9** the range of FTE jobs associated with the operation and maintenance of a single project are presented in **Table 5.2**. The table also shows estimated full time jobs per MW installed.

Table 5.2 Full time equivalent jobs predicted for the operation of a single project

Scenario	Direct employment	Indirect employment	TOTAL	
	FTE jobs	FTE jobs	FTE jobs	FTE jobs per MW installed
Low – 13 GigaWatts by 2021	216	180	396	0.33
Medium – 23 GigaWatts by 2021	240	192	432	0.35
High – 31 GigaWatts by 2021	300	216	516	0.42

5.2.11 The realistic worst case scenarios taken forward for assessment within this chapter are presented in **Table 5.3**. The identified worst case scenarios are also applied to the cumulative impact assessment.

Table 5.3 Realistic worst case scenario for the assessment of socio-economic impacts

Impact	Realistic worst case scenario	Rationale
Construction		
Impacts upon workforce and economy	*Single project* • Construction workforce of 1,680 FTE workers (based on low scenario – 1.4 workers per MW installed); and • Project expenditure (see paragraphs 6.2.1 to 6.2.8 in this chapter) based on values provided by Forewind. *Two projects* • Construction workforce of 3,360 FTE workers (based on low scenario – 1.4 workers per MW installed); and • Project expenditure based on values provided by Forewind.	The low scenario represents the least number of projected full time jobs for the construction of Dogger Bank Teesside A or B, and so represents a worst case for direct and indirect employment.
Operation		
	Single project • Operations and maintenance workforce of 396 FTE workers (based on low scenario – 0.33 workers per MW installed) *Two projects* • Operations and maintenance workforce of 792 FTE workers (based on low scenario – 0.33 workers per MW installed).	The low scenario represents the least number of projected full time jobs for the construction of Dogger Bank Teesside A or B, and so represents a worst case for direct and indirect employment.
Decommissioning		
	• Offshore infrastructure removed; • Any equipment associated with the landfall and the onshore transition bays will be left in-situ where appropriate. Any requirements for decommissioning at the landfall will be agreed with statutory consultees; • Onshore cabling will be disconnected and left *in situ*, unless otherwise agreed with the relevant planning authority; • Assets related to the two above ground converter stations will be dismantled and removed from site; and • The converter station foundations will be removed to 1m below ground level.	

6 Assessment of Impacts During Construction

6.1 Introduction

6.1.1 The construction phase of Dogger Bank Teesside A & B may have an effect on the following elements of the local and regional economy:

- Expenditure – financial investment for a number of organisations who will be supplying services and goods necessary for the development and construction of the wind farm; and
- Employment – direct development, construction and operations employment, and indirect employment further along the supply chain.

6.1.2 Potential impacts upon commercial fisheries are considered in **Chapter 15**; potential impacts upon tourism are discussed in **Chapter 23**, and potential impacts upon agriculture are considered in **Chapter 26**.

6.1.3 Whilst this assessment utilises figures based on industry projections, actual values for job creation and project expenditure will inevitably be subject to change. However, Forewind has used the lowest industry projections in order to represent the worst case.

6.2 Impacts

Expenditure

Single project

6.2.1 Dogger Bank Teesside A & B are significant infrastructure projects involving substantial total capital costs. However, as detailed in Section 4.2 it is not known whether it will significantly contribute to any individual regional economy, e.g. North East England, as the way in which funds are distributed within the UK and indeed within mainland Europe will depend upon the supply chain that is ultimately used.

6.2.2 It is currently unknown whether the centres for manufacturing will be located within the UK. As such, an estimate for the proportion of the associated project expenditure, based on the experience of other wind farm projects and specialist analysis (see sources) is provided in **Table 6.1**.

Table 6.1 Estimated component costs for Dogger Bank Teesside A or B

Component costs	Base contract value (£k/MW)	Indicative cost per project (at 1.2GW) (£m)
Wind Farm Array		
Turbine (including towers)	1,024[+]	1,228
Support structure (including towers)	551[+]	661

Component costs	Base contract value (£k/MW)	Indicative cost per project (at 1.2GW) (£m)
Array electrical (excl. export cable)	80[+]	96
Installation	473[+]	568
Development costs (supporting FID costs, insurance etc.)	227[++]	272
Transmission costs	-	826[+++]
TOTAL	**2,355**	**3,651**

Sources: + 2011 Study Cost Baseline, Offshore Wind Cost Reduction Pathways, EC Harris, May 2012
++ 2011 Study Cost Baseline, (Combination of i) project up to FID, ii) project from FID to WCD, and iii) construction phase insurance Capex costs), Offshore Wind Cost Reduction Pathways, EC Harris, May 2012.
+++ Potential for offshore transmission cost reductions, a report to the Crown Estate, Renewable UK February 2012.

6.2.3 As shown in **Table 6.1**, the development of an offshore wind farm of the scale of Dogger Bank Teesside A or B has the potential to generate significant levels of capital investment. Wind turbines and other primary components of a wind farm development will generate additional expenditure further along the supply chain, through the utilisation of third and fourth tier suppliers for component parts including bearings, gear and lubricants.

6.2.4 This direct expenditure can be expected to 'recirculate', and in doing so will support the indirect expenditure to other companies thus creating a 'multiplier' effect with the potential to deliver minor benefits to the local and regional economies. The extent of the benefit is difficult to quantify at this stage, in part due to the uncertainties surrounding the eventual scale of the offshore wind industry and associated developments in and around the North Sea.

6.2.5 It is expected that only a small proportion of the materials and equipment needed to install the offshore foundations, towers, turbines and cable work would be sourced from North East England. However, despite regional spend representing a small proportion of the overall cost, considering the numbers involved this still represents significant regional investment.

6.2.6 The amount of project expenditure recycled geographically close to the principal development sites, depends upon the size of study area and the specialism of the supply chain. Whilst a relatively small proportion of total project expenditure would be expected at the regional level, e.g. within North East England, it still represents a **potential beneficial effect** to those businesses that are well placed to support the development of Dogger Bank Teesside A & B.

Two projects

6.2.7 The two project build scenarios effectively double the associated expenditure of a single project as shown in **Table 6.1**. The amount of project expenditure recycled geographically close to the principal development sites, depends upon the size of study area and the specialism of the supply chain. As with a single project, the relatively small proportion of total project expenditure at the regional

level, e.g. within North East England, still represents a **potential beneficial effect** to those businesses that are best placed to support Dogger Bank Teesside A & B.

6.2.8 Forewind has developed a programme to actively engage and facilitate the development of the supply chain within North East England. This ongoing work is designed to ensure that businesses based in North East England are as well placed as they possibly can be to tender for the maximum amount of work related to the development of Dogger Bank Teesside A & B.

Direct Employment

Single project

6.2.9 Much of the employment that is generated by the construction of an offshore wind farm will be highly specialised and not necessarily based in North East England, or indeed within the United Kingdom. A proportion of the workforce needed for the project will be brought in from overseas with specialists travelling from outside the country, although based in the vicinity of the works for the construction period (either elements of, or the entire period).

6.2.10 **Table 6.2** shows an estimated breakdown of the potential FTE direct employment opportunities arising during the construction of either project, based on the low scenario given in **Table 5.1**.

Table 6.2 Breakdown of direct employment by area for a single project

Area	Estimated Direct Employment during Construction (% of total workforce)*
North East England	436 (40%)
Rest of the UK	360 (33%)
Overseas	294 (27%)
Total	**1,092**

* Percentage breakdowns based on those reported within Galloper Wind Farm Environmental Statement (GWFL, 2010)

6.2.11 The figures indicate that a large proportion of the jobs generated will be available to the regional and UK labour markets. Multiple benefits to the local economy are anticipated through, for example, the temporary relocation of offshore specialist construction and associated staff and the provision of laydown areas for components such as turbine blades. In addition, construction of the onshore elements of Dogger Bank Teesside A & B will be entirely located within the Borough of Redcar & Cleveland.

6.2.12 The construction of either Dogger Bank Teesside A or B has the potential to generate an estimated 436 FTE jobs in North East England, particularly within the engineering and construction sectors. Whilst this is relatively small

compared to the regional job market, it still represents a **potential beneficial effect** upon employment levels in the region.

Two projects

6.2.13 The two project scenarios effectively double the number of jobs created compared to a single project.

6.2.14 The construction of both Dogger Bank Teesside A & B projects has the potential to generate an estimated 872 FTE jobs in North East England. Compared to the numbers of people already employed in North East England (approximately 2,167,000) the creation of 872 FTE jobs represents a modest, though nonetheless important number of new positions, and is considered a **potential beneficial effect** to employment in the region.

6.2.15 Forewind is committed to investing in North East England to ensure that the region is well positioned to tender for the greatest possible share of the work. Forewind is actively supporting initiatives such as the Champions for Wind careers education engagement programme. This scheme is designed to raise awareness of, and provide inspiration to, young people of primary and high school age about potential career opportunities in offshore wind energy, giving them an understanding of the qualifications and experience required to gain employment in the industry.

Indirect and induced employment

Single project

6.2.16 Indirect employment considers those jobs generated through the additional demand created by primary construction activities. In relation to Dogger Bank Teesside A or B, this will include the provision of construction materials for laydown areas and haul roads (their creation and/or extension) and support services to vessels involved in offshore construction activities.

6.2.17 The overall number of jobs created as a result of either project is limited when considered in terms of the regional economy. However, local business can be expected to see a diverse range of benefits through the provision of support services, goods, accommodation for project workers, etc.

6.2.18 Those people who are employed directly and indirectly by the project will in turn give rise to what is referred to as ‘induced employment’ as wages paid to project-related workers and profits made support other jobs as these wages and profits are spent. However, the amount of spending that ultimately occurs as a result of these projects is very difficult to determine at this stage.

6.2.19 Based on the figures presented in **Table 5.1**, a total of 588 FTE indirect jobs are expected to be created during the construction of either Dogger Bank Teesside A or B. As with direct employment, whilst this number is relatively small compared to the regional job market, it still represents a **potential beneficial effect** to employment in the region.

Two projects

6.2.20 The two project scenarios effectively double the number of jobs created compared to a single project.

6.2.21 An estimated 1,092 FTE indirect jobs are expected to be created during the construction of both Dogger Bank Teesside A & B. As per the single project scenario, this represents a **potential beneficial effect** to employment in the region.

7 Assessment of Impacts During Operation

7.1 Impacts

Single project

7.1.1 Maintenance will be required throughout the operational life of Dogger Bank Teesside A & B. Technical work associated with the operational phase has its primary focus offshore. In addition, onshore centres will cater for the associated management and administrative roles, as well as serving as bases for vessel operators. At this stage there is no certainty as to where the port to service the wind farm will be located. In order to undertake an assessment it is assumed that an operations base could be located in the North East region. Notwithstanding the uncertainties surrounding the location of the operational maintenance port, the economic benefits detailed within this section are considered valid in broad terms irrespective of the final location of the servicing port.

7.1.2 An operational port will be utilised from which vessels and equipment could service the wind farms. Full time service crews will deal with routine maintenance and any defects arising during the first year of operation. After the first year, smaller teams will undertake scheduled servicing and maintenance programmes. In addition to this scheduled maintenance, unscheduled work such as repairs or component replacement (e.g. gearbox or transformer replacement) can be expected periodically and would require larger teams associated with the hire of a construction vessel periodically. All maintenance and repair work will also make a contribution to the revenues of hoteliers and bed and breakfasts, shops and restaurants in the local area.

7.1.3 An estimated 396 FTE direct and indirect jobs are expected to be created during the operation of either Dogger Bank Teesside A or B (refer to **Table 5.2**). As these jobs will involve maintenance and operational support roles, it can reasonably be anticipated that they will be based at a suitable support base (port). Thus whilst representing relatively small numbers of jobs when compared to regional employment figures, for a location such as the port of Hull, such an increase would nonetheless represent a **potential beneficial impact**.

Two projects

7.1.4 The two project scenarios represent a potential doubling of the number of direct and indirect FTE jobs compared to a single project.

7.1.5 As such, it is estimated that 792 FTE direct and indirect jobs would be created, based on the low scenario, during the operation of both projects. As for the single project scenario, these jobs would be based at a suitable support base (port). Whilst representing relatively small numbers of jobs at a regional level, for a location such as the port of Hull, such an increase would nonetheless represent a **potential beneficial impact**.

8 Assessment of Impacts During Decommissioning

8.1 Impacts

8.1.1 The decommissioning of the onshore electrical connection, including the cable route and the converter stations will form part of an overall decommissioning plan for Dogger Bank Teesside A & B, for which a full EIA will be carried out ahead of any decommissioning works being undertaken.

8.1.2 Decommissioning will entail considerable expenditure and will necessitate employment at similar levels, and with comparable experience and expertise, to that required during construction. However, it is not possible at this stage to determine the scale of economic effect for this operation. Therefore impacts are anticipated to be commensurate with the beneficial impacts assessed in the construction phase.

8.1.3 The specific onshore decommissioning processes and activities will be subject to agreement from the relevant regulators at that time, but are expected to include:

- Offshore infrastructure being removed;
- Onshore cabling will be disconnected and left *in situ*, unless otherwise agreed with the relevant planning authority;
- Assets relating to the two above ground converter stations will be dismantled and removed from site; and
- The converter station foundations will be removed to 1m below ground level.

8.1.4 These activities are likely to require a similar workforce to that involved in the construction phase. Therefore **beneficial impacts** in terms of job creation are assumed to be of a similar scale to those detailed for the construction phase.

9 Inter-relationships

9.1 Inter-relationships

9.1.1 In order to address the environmental impact of the proposed development as a whole, this section summarises the inter-relationships between socio-economics and other physical, environmental and human receptors (**Table 9.1**). The objective is to identify where the accumulation of effects on a single receptor, and the relationship between those effects, may give rise to more significant impact than in isolation which may, in turn, result in a need for additional mitigation.

9.1.2 **Chapter 31 Inter-relationships** provides a more detailed holistic overview of the potential impacts that may manifest themselves on the same receptors as well as socio-economic impacts.

Table 9.1 Inter-relationships relevant to the assessment of socio-economic impacts

Inter-relationship	Section where addressed	Linked Chapter
All Phases		
Influence of commercial fishing upon the local socio-economic environment	Sections 15.5, 15.6, 15.7 and 15.8	**Chapter 15 Commercial Fisheries**
Influence of tourism and recreation upon the local socio-economic environment	Sections 23.5, 23.6, 23.7 and 23.8	**Chapter 23 Tourism and Recreation**
Influence of agriculture upon the local socio-economic environment	Sections 26.5, 26.6, 26.7 and 26.8	**Chapter 26 Land Use and Agriculture**

10 Cumulative Impacts

10.1 Cumulative impacts

10.1.1 This section describes the Cumulative Impact Assessment (CIA) for socio-economics, taking into consideration other plans, projects and activities. A summary of the CIA is presented in **Chapter 33**.

10.1.2 Forewind has developed a strategy for the assessment of cumulative impacts in consultation with statutory stakeholders including RCBC, the Marine Management Organisation (MMO), the Joint Nature Conservation Committee (JNCC), Natural England and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Details of the approach to CIA adopted for this Environmental Statement are provided in **Chapter 4 EIA Process**.

10.1.3 The strategy recognises that data and information sufficient to undertake an assessment will not be available for all potential projects, activities, plans and/or parameters, and seeks to establish the confidence in the data and other information that is available.

10.1.4 In its simplest form the strategy involves consideration of:

Onshore

- Whether impacts on a receptor can occur on a cumulative basis between the onshore elements of Dogger Bank Teesside A & B and other activities, projects and plans for which sufficient information regarding location and scale exist.

Offshore

- Whether impacts on a receptor can occur on a cumulative basis between the wind farm project(s) subject to the application(s) and other wind farm projects, activities and plans in the Dogger Bank Zone (either consented or forthcoming); and
- Whether impacts on a receptor can occur on a cumulative basis with other activities, projects and plans outwith the Dogger Bank Zone (e.g. other offshore wind farm developments), for which sufficient information regarding location and scale exist.

10.1.5 **Table 10.1** provides details of the other projects and plans considered relevant to the socio-economic impact assessment.

Table 10.1 Projects considered within the socio-economic cumulative impact assessment

Type of project	Title	Expected construction date	Taken forward for cumulative impact assessment?
Offshore wind farm	Dogger Bank Creyke Beck A	Construction may start from 2016	Yes
Offshore wind farm	Dogger Bank Creyke Beck B	Construction may start from 2016	Yes
Offshore wind farm	Dogger Bank Teesside C	Construction may start from 2018	Yes
Offshore wind farm	Dogger Bank Teesside D	Construction may start from 2018	Yes
Offshore wind farm	Hornsea Offshore Wind Farm Project One	From 2015	Yes
Offshore wind farm	East Anglia One	2014/2015	No, given its location offshore it is considered unlikely that this project will impact the North East regional economy
Energy infrastructure	Tees Renewable Energy Plant	2013-2015	Yes
Pipeline	York Potash project	Unknown	Yes
Infrastructure construction	Meteorological mast installation	No later than 2014	Yes
Transport infrastructure	Northern Gateway Terminal	Unknown	Yes
Pipeline	Breagh Pipeline	No later than 2015	Yes
Energy infrastructure	Teesside Power Station	Unknown	Yes
Infrastructure construction	Potash processing plant	Unknown	Yes

10.1.6 Whilst detailed consideration of the effects of the proposed Dogger Bank Teesside A & B projects on the offshore wind supply chain and capital investment within the industry is beyond the scope of the EIA, the development, construction and operation of Dogger Bank Teesside A & B will encourage the advancement of production capability in the industry, therefore supporting the development of future offshore wind farm projects and the national and regional economies.

10.1.7 Operating in a competitive market, new infrastructure required for one wind farm could be made available for other wind farms. This would have the effect of reducing the costs and timescales of future projects, enabling a more efficient development programme. Additionally, the continued expansion of the UK offshore wind industry should result in a more UK-focussed supply chain and pool of expertise.

10.1.8 The construction and operation of Dogger Bank Teesside A & B will support regional economic growth by providing demand for wind farm components, encouraging the development of productive capital and providing experience (developing human capital) for those employed in its development, construction and operation. The project will, therefore, contribute to the continued development of the offshore wind industry in the north east region.

10.1.9 The local and regional economy is also expected to benefit from the construction and operation of Dogger Bank Teesside C & D. These are two further offshore wind farm developments within the Dogger Bank Zone, located in Tranche 3 and to the north of Dogger Bank Creyke Beck and Dogger Bank Teesside A & B. The export cable corridor for Dogger Bank Teesside C & D will come ashore in the same location as Dogger Bank Teesside A & B.

10.1.10 In addition, Dogger Bank Creyke Beck and Hornsea Offshore Wind farm Project One are further Round 3 wind farms proposed off the east coast of England. It is anticipated that they would generate significant levels of job creation and expenditure during construction and operation as Dogger Bank Teesside A & B. There is the potential that these projects could also be based in the North East region and would offer further job opportunities and associated project expenditure. As such, **potential beneficial cumulative impacts** are possible for the regional economy as well as direct and indirect employment, should these major wind farm projects be based within the North East region.

11 Transboundary Effects

11.1 Transboundary effects

11.1.1 The assessment of socio-economic impacts is based on the project expenditure and job creation being assessed for a single region (North East England). Notwithstanding the uncertainties surrounding the location of the construction and operational ports, the economic benefits detailed within this chapter are considered valid in broad terms irrespective of the final location of the servicing port, i.e. the findings would be equally applicable to the relevant local economies, should the construction and operation ports be located outside of the UK.

12 Summary

12.1 Summary

12.1.1 This chapter of the ES has provided a characterisation of the existing environment for socio-economics.

12.1.2 The socio-economic impacts of Dogger Bank Teesside A & B are considered within the regional and national policy framework for energy and energy infrastructure. Government strategic assessments and policy statements have made the case that an increase in energy produced from renewable sources will not only increase the security of energy supplies, but will also provide opportunities for investment in new industries. The Government's Renewables Roadmap notes that nationally, renewable energy could employ half a million people by 2020 and that the creation of these new jobs in the renewable energy sector, with the accompanying investment in new manufacturing capability will support the nation's transition to a green economy. The NPSs recognise that the construction, operation and decommissioning of energy infrastructure may have socio-economic impacts and sets out some of the national level impacts.

12.1.3 This assessment has considered socio-economic impacts at the local and regional levels. It has considered the impacts of construction, operation and decommissioning of Dogger Bank Teesside A & B upon a range of socio-economic receptors. Available guidance notes that potential socio-economic impacts of new energy infrastructure should be considered with any other sources that the Planning Inspectorate considers to be both relevant and important to its decision, which includes the case already made in the NPSs and other Government assessments at the national level.

12.1.4 Forewind has not yet confirmed which port(s) will be used to support construction activities, and there may not be a single 'base' construction or workers' port. Therefore, an assessment of socio-economic impacts at a named port or ports has not been undertaken. Once a construction port has been confirmed, the future developers and operators of the development will work closely with the port authority and relevant local authority to ensure that all potential impacts are fully understood and measures are proposed where relevant.

12.1.5 For this assessment the north east region was identified as a realistic economy within which both the onshore and offshore projects could be based. Potential impacts at the local (Redcar & Cleveland Borough) level were also assessed.

12.1.6 Potential beneficial impacts have been identified for the construction, operational and decommissioning phases, relating to project expenditure and direct and indirect job creation. In addition, a number of other proposed offshore wind farms may be based in the north east region. These have been identified as

there is potential for cumulative beneficial impacts on the regional economy as well as job creation opportunities within the region.

12.1.7 Forewind supports the Government's ambition that UK firms should provide a significant proportion of the content of future offshore wind farms. Forewind and its shareholders will continue to proactively engage with the UK supply chain and regional suppliers in particular, to ensure that a high quality, sustainable supply base for the industry can be developed. Forewind has already supported initiatives in North East England to ensure businesses are well positioned to tender for the greatest possible share of future work.

12.1.8 Forewind is actively supporting initiatives such as the Champions for Wind careers education engagement programme, a scheme designed to raise awareness and provide inspiration to young people of the potential career opportunities in offshore wind energy.

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