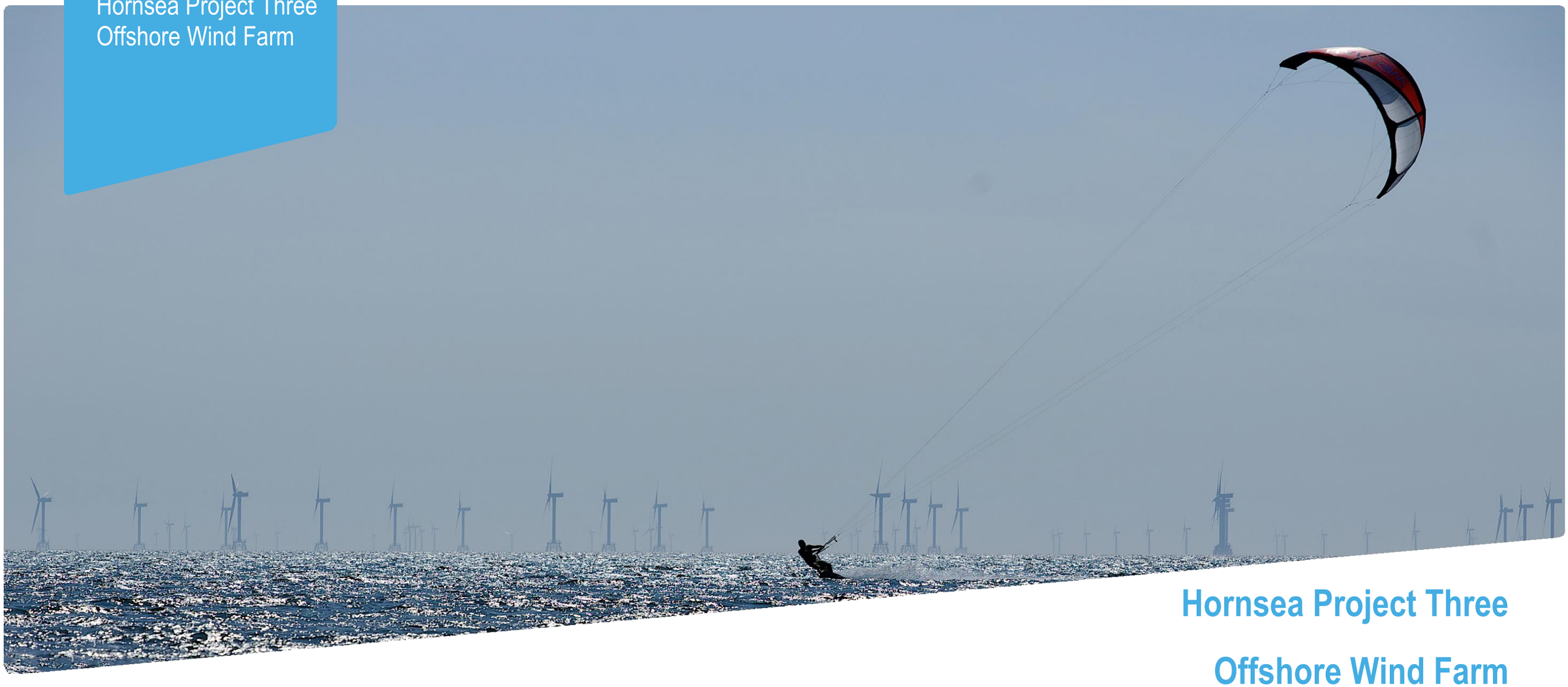
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Preliminary Environmental Information Report:
Chapter 10 – Socio-economics

Date: July 2017

Hornsea 3
Offshore Wind Farm

DONG energy

Environmental Impact Assessment

Preliminary Environmental Impact Report

Volume 3

Chapter 10 – Socio-economics

Liability

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Front cover picture: Kite surfer near one of DONG Energy's UK offshore wind farms © DONG Energy Hornsea Project Three (UK) Ltd., 2016.

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Table of Contents

List of Tables

List of Figures

Glossary

Term	Definition
Direct Economic Impact	Increases in economic output and/or employment generated by The Applicant/operator of the project as a result of the project going ahead, plus increases in economic output and employment among suppliers who provide goods and services directly to the project.
Direct Gross Value Added	The contribution of individual businesses, industries or sectors to the economy as a result of the direct expenditure associated with the proposed development.
Economic Activity Rate	The proportion of an area's working age population who are either in employment or actively seeking work. This includes self-employed people and part time workers.
Element	Component or part.
Energy Estuary	Humber LEP's strategic ambition to become a national and international centre for renewable energy by securing investment and supporting the development of the industry.
Enterprise Zones	Geographically defined areas, agreed between the local enterprise partnership and Government. The core offer for businesses in the Zone relates to simplified planning and business rates discounts, with Zones having the potential to develop innovative solutions to address the specific local economic challenges.
Full Time Equivalent (FTE)	A unit for measuring employment which indicates the workload associated with each post. One FTE is the equivalent of a full time post. An FTE of 0.5 indicates that a post is half time.
Gross Value Added (GVA)	The value to the economy of activity generated through construction and O&M of the scheme. Gross Value Added is effectively a measure of the additional profits generated in businesses benefiting from the activity plus additional salaries that are paid to their employees.
Humber Local Enterprise Partnership	The strategic economic development body for Humber covering the following local authorities: Hull, East Riding, North Lincolnshire, and North East Lincolnshire.
Indirect Economic Impact	As suppliers to the project increase output to meet the additional demand for their goods and services associated with the project, there will also be a corresponding increase in demand on their own suppliers and down their supply chains - the resulting increase in economic output and employment is termed the "indirect effect".
Induced Economic Impact	An injection of additional expenditure that will recirculate throughout the economy as a result of direct economic impacts and indirect economic impacts.
Induced Gross Value Added	The value to the economy that is realised as a result of the additional expenditure that will recirculate throughout the economy as a result of direct economic impacts and indirect economic impacts.
Location Quotient	Location quotient is a measure of industry employment concentration in a given area relative to the national level (the value for the UK equals one, so a value of greater than one represents a higher than average industry concentration).
New Anglia Local Enterprise Partnership	A business-led collaboration between the private, public and education sectors across Norfolk and Suffolk, covering the following local authorities: Babergh, Broadland, Great Yarmouth, Kings' Lynn
Nomenclature of Territorial Units for Statistics 3	A single hierarchical classification of spatial units used for statistical production across the European Union (EU). At the top of the hierarchy are the individual member states of the EU; below that are levels 1 to 3. NUTS3 includes counties, unitary authorities or districts.
Person Years	A unit of measurement used to capture temporary employment impact. One person year is the equivalent of one Full Time Equivalent post, but may in practice be made up of a number of temporary posts which sum to a person year.
Working Age Population	People aged 16 to 64.

Acronyms

Acronyms	Description
BEIS	Department for Business, Energy and Industrial Strategy
CEA	Cumulative Effect Assessment
CORE	Centre for Offshore Renewable Engineering
DCLG	Department for Communities and Local Government
EIA	Environmental Impact Assessment
FTE	Full Time Equivalent
GVA	Gross Value Added
LEP	Local Enterprise Partnership
LQ	Location Quotient
MHWS	Mean High Water Springs
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIPs	Nationally Significant Infrastructure Projects
NUTS	Nomenclature of Territorial Units for Statistics
O&M	Operation and Maintenance
ONS	Office for National Statistics
PEIR	Preliminary Environmental Information Report
SEP	Strategic Economic Plan
SIC	Standard Industrial Classification

Units

Unit	Description
GW	Gigawatt (power)
kV	Kilovolt (electrical potential)
kW	Kilowatt (power)
km	Kilometre (distance)
km^2	Kilometre Squared (area)

10. Socio-economics

10.1 Introduction

10.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the initial considerations for the Environmental Impact Assessment (EIA) of the onshore and offshore elements of the Hornsea Project Three offshore wind farm (hereafter referred to as Hornsea Three) relevant to socio-economics during its construction, operation and maintenance and decommissioning.

10.1.1.2 The socio-economics chapter assesses impacts which are experienced onshore, including those resulting from offshore activities.

10.1.1.3 Onshore comprises the Hornsea Three landfall area, the onshore cable corridor search area, the onshore HVAC booster station, the onshore HVDC converter/HVAC substation and the interconnection with the Norwich Main National Grid substation. The cable corridor search area comprises a 200 m wide corridor within which the refined cable corridor (80 m wide) will be located. The refined onshore cable corridor will be included in the application for Development Consent. The onshore HVAC booster station will only be required for the HVAC transmission option (see volume 1, chapter 3: Project Description).

10.1.1.4 Offshore comprises the socio-economic impacts associated with the construction, operation and maintenance and decommissioning of the array area and the offshore cable corridor.

10.2 Purpose of this chapter

10.2.1.1 The primary purpose of the Environmental Statement is to support the Development Consent Order (DCO) application for Hornsea Three under the Planning Act 2008 (the 2008 Act). This PEIR constitutes the Preliminary Environmental Information for Hornsea Three and sets out the findings of the EIA to date to support pre-application consultation activities required under the 2008 Act. The EIA will be finalised following completion of pre-application consultation and the Environmental Statement will accompany the application to the Secretary of State for Development Consent. A Consultation Report will be produced, capturing the consultation activities which have been undertaken to date, a summary of the key issues raised during consultation specific to socio economics, and how these issues will be considered. Both the Environmental Statement and the Consultation Report will be submitted as part of the suite of documents for the final DCO application in Quarter 2 of 2018.

10.2.1.2 The PEIR will form the basis for Phase 2 Consultation which will commence on 27 July and conclude on 20 September 2017. At this point, comments received on the PEIR will be reviewed and incorporated (where appropriate) into the Environmental Statement, which will be submitted in support of the application for Development Consent scheduled for the second quarter of 2018. In particular this PEIR chapter:

- Presents the existing socio-economic baseline established from desk studies, dedicated surveys and consultation;
- Presents initial considerations for the socio-economic assessment for Hornsea Three and the next steps leading up to the full assessment of effects that will be carried out and presented as part of the final DCO application;
- Presents the preliminary assessment of the potential effects on tourism and recreation, based on the information gathered and the analysis and assessments undertaken to date;
- Identifies any assumptions and limitations encountered in compiling the preliminary environmental information; and
- Where appropriate at this stage in the assessment, highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible adverse environmental effects identified at the relevant stage in the EIA process.

10.2.1.3 As the research on the nature and strength of the offshore wind supply chain in the UK is on-going with the assistance of DONG Energy and other stakeholders, the full assessment of the socio-economic effects will be included in the final Environmental Statement submitted as part of the DCO application. As a result, the assessment of Hornsea Three on main socio-economic receptors is not presented in this chapter, as is limited to the assessment of effects on tourism and recreation.

10.2.1.4 Hornsea Three welcomes feedback on the initial considerations presented in the PEIR and the proposed approach to the full assessment that will be carried out in the coming months.

10.2.1.5 Whilst this chapter focuses on considerations for the onshore socio-economic impacts of Hornsea Three, the assessment will also takes into account the impacts of the offshore works.

10.3 Study area

10.3.1.1 Three socio-economic study areas have been identified for Hornsea Three. The local study area is linked to the search area for construction and O&M ports. In light of the uncertainty that currently exists in relation to the selection of construction and O&M ports, the assessment will include two separate impact areas for employment and GVA related effects. These have been identified as New Anglia Local Enterprise Partnership (LEP) area and Humber LEP area (see Figure 10.1 and Figure 10.2):

- The New Anglia LEP area encompasses two counties of Norfolk and Suffolk, and 14 local authority districts; and
- Humber LEP area contains four unitary authorities.

10.3.1.2 Both impact areas include ports which, at this stage, appear to have potential to play a role in the construction and / or operation and maintenance of Hornsea Three. The decision on which ports will be used for either construction and/or operation and maintenance will not occur until after Consent examination, as the design of Hornsea Three is refined and supply chain opportunities explored further. The selection of construction and operation ports will then be determined by the outcome of the procurement exercise and therefore will not be clear until after the Environmental Statement has been prepared.

10.3.1.3 In light of this, the assessment will in due course consider each of the areas as separate impact areas when considering the employment and GVA related receptors.

10.3.1.4 The identified Local Impact Areas fall into the following regions: New Anglia LEP is part of the East Midlands region, while Humber LEP is park of Yorkshire and the Humber. Regional impact areas have not been included in the assessment due to the reduced importance of regions within economic development policy since 2010, and therefore no public sector partners who could be consulted.

10.3.1.5 The third study area is the UK Impact Area. It covers the whole of the UK (i.e. England, Scotland, Wales and Northern Ireland). This has been defined to enable the national significance of effects to be assessed. Where data is not available at the UK level (for example, Office for National Statistics (ONS) employment data is available for Great Britain rather than the United Kingdom), this is clearly denoted within the commentary.

10.3.1.6 Effects in the UK Impact Area will only be assessed in the ES where they are relevant to the receptor. For example, the assessment of receptors relating to access to employment amongst local people, effects on local sectors (renewable energy and tourism) are presented for the Hornsea Three Local Impact Areas but not for the UK. In practice, this means that the UK Impact Area is only used for receptors relating to employment and GVA created during the construction, operation and maintenance (O&M) and decommissioning phases.

10.3.1.7 For tourism and recreation receptors, a Tourism Impact Area has been defined. The effects on tourism and recreation will likely be focused on the local authority areas through which the onshore ECR corridor crosses. Therefore, the Tourism Impact Area has been defined as the local authorities of North Norfolk, Broadland and South Norfolk.

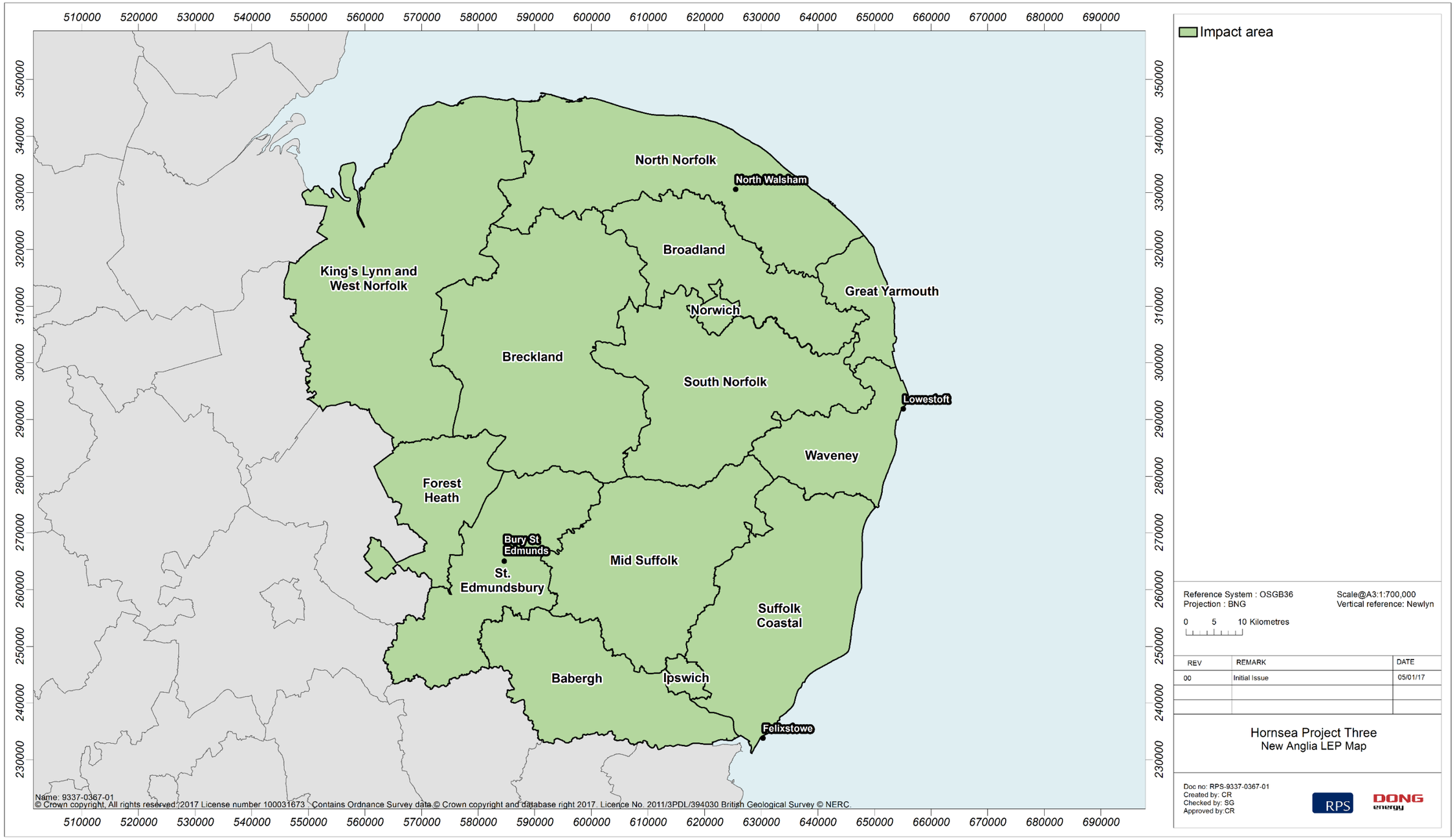


Figure 10.1: New Anglia LEP

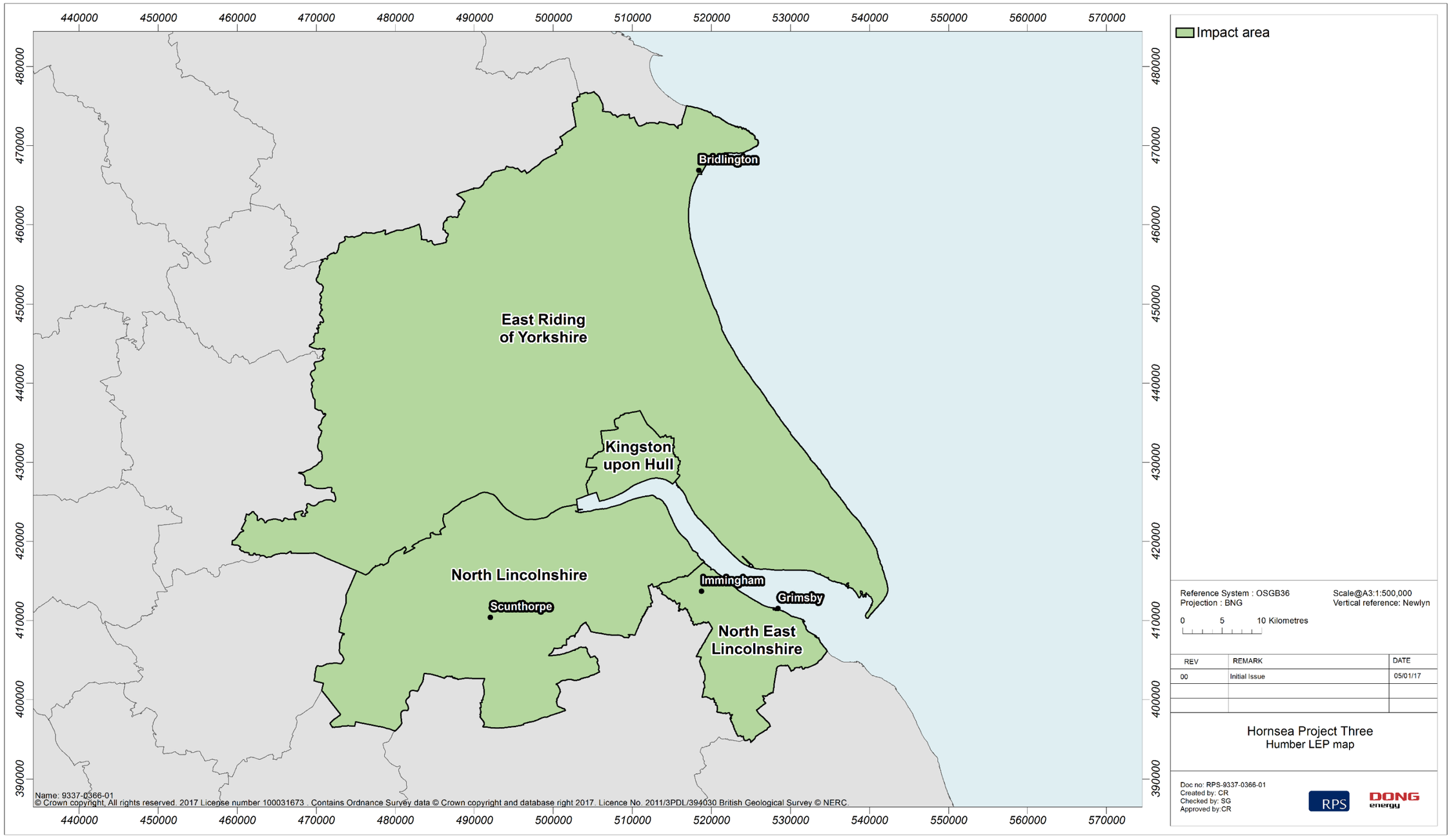


Figure 10.2: Humber LEP

10.4 Planning policy context

10.4.1 Nationally Significant Infrastructure Planning Policy

10.4.1.1 Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to socio-economics, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1) (DECC, 2011a), the NPS for Renewable Energy Infrastructure (EN-3) (DECC, 2011b) and the NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c) Neither the National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) nor the National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) provide specific guidance on socio-economic issues.

10.4.1.2 NPS EN-1 includes guidance on what matters are to be considered in the assessment. These are summarised in Table 10.1.

Table 10.1: Summary of NPS EN-1 provisions relevant to socio-economics.

Summary of NPS EN-1 provision	How and where considered in the PEIR
Socio-economics	
This assessment should consider all relevant socio-economic effects, which may include the creation of jobs and training opportunities (paragraph 5.12.3 of NPS EN-1).	Employment effects will be considered under the assessment of the effect of Hornsea Three construction, operation and maintenance, and decommissioning on employment. The potential training opportunities associated with the Hornsea Three will be assessed qualitatively as part of the assessment of the Access to Employment Amongst Local Residents receptors in the construction and operation and maintenance phases.
This assessment should consider all relevant socio-economic effects, which may include the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities (paragraph 5.12.3 of NPS EN-1).	Additional local infrastructure requirements will be considered under the assessment of local effects during construction and operation and maintenance. The assessment of effects on demand for and provision of local services will be considered in the assessment of the housing, accommodation and local services receptor. The focus of the assessment will be on demand created as a result of employment impacts associated with the Hornsea Three.
This assessment should consider all relevant socio-economic effects, which may include effects on tourism (paragraph 5.12.3 of NPS EN-1).	The effects on tourism and recreation are addressed under the assessment of effects on two receptors relating to offshore, coastal tourism and recreational resources. The effects during the construction phase are assessed in section 10.10.2, Effects during operation and maintenance are assessed in section 10.10.3. Effects associated with decommissioning activity are assessed in section 10.10.4.
This assessment should consider all relevant socio-economic effects, which may include the impact of a changing influx of workers during the different construction, O&M and decommissioning phases of the energy infrastructure (paragraph 5.12.3 of NPS EN-1).	Effects associated with a changing influx of workers will be assessed as part of the assessment of receptors relating to the demand for housing, accommodation and local services during the construction phase, the operation and maintenance phase and the decommissioning phase.
This assessment should consider all relevant socio-economic effects, which may include cumulative effects – if development consent were to be granted 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 the region (paragraph 5.12.3 of NPS EN-1).	These will be addressed under the cumulative effects section of this chapter (see Section 10.11).

10.4.1.3 NPS EN-1 highlights a number of points relating to the determination of an application and in relation to mitigation (paragraphs 5.12.6 to 5.12.9). These are summarised in Table 10.2.

Table 10.2: Summary of NPS EN-1 policy on decision making relevant to socio-economics.

Summary of NPS EN-1 policy on decision making (and mitigation)	How and where considered in the PEIR
Socio-economics	
PINS should have regard to the potential socio-economic effects of new energy infrastructure identified by the Applicant and from any other sources that PINS considers to be both relevant and important to its decision. It should be reasonable for PINS to conclude that little weight is to be given to assertions of socio-economic effects not supported by evidence (particularly in view of the need for energy infrastructure as set out in this NPS) (paragraph 5.12.6-5.12.7 of NPS EN-1).	The Hornsea Three assessment that is submitted as part of the final DCO application will provide evidence throughout of likely socio-economic impact considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning. Consultation with affected stakeholders has been carried out from the early stages of the project.
The assessment should consider any relevant positive provisions the Applicant has made or is proposing to make to mitigate impacts (for example through planning obligations) and any legacy benefits that may arise as well as any options for phasing development in relation to socio-economic impacts (paragraph 5.12.8 of NPS EN-1).	Current proposals to boost local capture of socio-economic effects are outlined in paragraph 10.10.1.

10.4.1.4 Other planning policy and guidance relevant to this chapter includes:

- National Planning Policy Framework (NPPF) (2012);
- Joint Core Strategy (covering Broadland District, Norwich City and South Norfolk District (2011); and
- North Norfolk District Council Core Strategy (2008).

10.4.2 National Planning Policy Framework (2012)

10.4.2.1 The National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012) explains that the purpose of the planning system is to contribute to the achievement of sustainable development. While the NPPF does not contain specific policy statements for nationally significant infrastructure projects, it outlines the dimensions for sustainable development which are a relevant consideration. These are economic, social and environmental. This chapter is concerned with both the economic and social dimensions of sustainable development which are defined in the NPPF as follows:

- **An economic role** – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure; and
- **A social role** – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being.

10.4.2.2 The NPPF explains (at paragraph 93) that planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure, and that this is central to the economic, social and environmental dimensions of sustainable development.

10.4.3 Local Planning Policy

10.4.3.1 As the application for development consent will be determined by the Secretary of State, the most relevant policy context is set out in the NPS and particularly NPS EN-1. However, local planning policy also includes material which is relevant to offshore wind farm developments, their relationship to local economic development and the assessment of socio-economic impacts associated with these schemes.

10.4.3.2 The onshore cable corridor search area is located within the districts of South Norfolk, Broadland and North Norfolk. The proposed onshore HVDC converter/HVAC substation site is also located in South Norfolk and the onshore HVAC booster station is located within the North Norfolk district. The following local planning documents in particular should be noted:

- Joint Core Strategy for Broadland, Norwich and South Norfolk (Greater Norwich Development Partnership, 2014). The joint strategy outlines the ambition to ensure more energy is sourced from renewable sources. Policy 3: Energy and water aims to minimise reliance on non-renewable energy sources and maximise the use low-carbon sources. Policy 5: The economy states that the "*local economy will be developed in a sustainable way to support jobs and economic growth in both urban and rural locations*". Policy 21: Implementation of proposals in the Broadland part of the Norwich Policy Area states that Broadland District Council will "*work proactively with applicants jointly to find solutions ….to secure development that improves economic, social and environmental conditions in the area*".
- North Norfolk Core Strategy (North Norfolk District Council, 2008). The strategy sees an increasing role for renewable energy generation, including offshore wind. Core Aim 2 is focused on mitigating and adapting the effects of climate change by encouraging renewable energy production. Policy EN7 further states that renewable energy proposals will be supported, and for large scale projects the proposals should deliver economic, social, environmental or community benefits of a reasonable scale to the local area.

10.4.4 UK Marine Policy

10.4.4.1 The UK-wide Marine Policy Statement (MPS) was published in March 2011, under the Marine and Coastal Access Act (MCAA) 2009, in order to provide a framework for marine spatial planning, specifically for the preparation of Marine Plans and taking decisions that affect the marine environment (Defra, 2011). The MCAA requires all public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area to do so in accordance with the MPS and the relevant Marine Plans.

10.4.4.2 The MPS provides that the following issues relevant to socio-economic considerations should be taken into account by decision makers when examining and determining applications for energy infrastructure:

Table 10.3: Summary of MPS provisions relevant to socio-economics.

Summary of MPS policy on decision making (and mitigation)	How and where considered in the PEIR
Socio-economics	
Properly planned developments in the marine area can provide environmental and social benefits as well as drive economic development, provide opportunities for investment and generate export and tax revenues.	The Hornsea Three assessment that will be submitted with the final DCO application will provide evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning.
There are obvious social and economic benefits from such an increase in network capacity, most notably the facilitation of offshore renewable energy. There are also social and economic risks associated with such an increase in underwater cabling, which may affect activities such as dredging and the use of certain fishing gear, and impact on other sea users, including existing cable and pipeline operators.	The Hornsea Three assessment that will be submitted with the final DCO application will provide evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning. Potential impacts on other marine users are considered in volume 2, chapter 6: Commercial Fisheries and volume 2, chapter 11: Infrastructure and Other Users.
The marine plan authority should ensure, through integration with terrestrial planning, and engagement with coastal communities, that marine planning contributes to securing sustainable economic growth both in regeneration areas and areas that already benefit from strong local economies.	The Hornsea Three assessment that will be submitted with the final DCO application will provide evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning.

Summary of MPS policy on decision making (and mitigation)	How and where considered in the PEIR
Tourism can provide environmental benefits through helping to enhance understanding and appreciation of the marine environment through activities such as eco-tourism and nature watching.	The Hornsea Three assessment that will be submitted with the final DCO application will provide evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning. Potential impacts on tourism are considered in sections 10.10.2, 10.10.3 and 10.10.4 of the PEIR.

10.4.5 UK Economic Development Policy

10.4.5.1 The most recent addition to industrial strategy and the centre-piece of the current government's economic agenda is the February 2017 Green Paper titled "Building our Industrial Strategy" (HM Government, 2017). The underlying motivation of the strategy is "*to improve living standards and economic growth by driving productivity and growth across the whole country*."

10.4.5.2 The Government identified 10 pillars as the bedrock of its industrial strategy, which are the means to spur economic growth, drive forward productivity and deliver prosperity. The pillars consist of predominantly cross-cutting interventions such as investing in science, research, innovation and infrastructure, access to finance and promotion of trade and inward investment.

10.4.5.3 Securing affordable energy will be important in delivering the Government's industrial priorities. The strategy identifies two important areas of priority for energy: affordability and maximising industrial opportunities for the UK economy from energy innovations. The strategy seeks to ensure that the UK secures a substantial share of global markets where its energy industries present an opportunity, such as offshore oil and gas and clusters of excellence such as the east coast. This includes the development of energy technologies such as manufacturing services around clean energy, new grid technologies and offshore wind technologies.

10.4.5.4 The importance of renewable energy and specifically offshore technologies, to the UK's economic policy is illustrated by the commitments made by Department of Energy and Climate Change (DECC) and Department for Business, Innovation and Skills (which have now been combined into the Department for Business, Energy and Industrial Strategy (BEIS) to maximising the economic benefit of renewable energy, especially offshore wind farm developments.

10.4.5.5 As part of this, six Centres for Offshore Renewable Engineering (COREs) have been established by UK Government across the UK (two of which cover Hull and the Humber Estuary, and Great Yarmouth and Lowestoft). The intervention is driven by the need to meet the legally binding renewables target by 2020 as set out in the Renewable Energy Roadmap and there is a need to support the offshore wind manufacturing capacity in order to achieve it (HM Government, 2011). Hence CORE's aim is to maximise the ability of areas to benefit from opportunities in offshore engineering. Support structures that are in place include the establishment of Enterprise Zones with simplified planning regimes and enhanced capital allowances, among other incentives.

10.4.5.6 The Offshore Wind Industrial Strategy published in 2013 (HM Government, 2013) highlights that it is a government goal to strengthen UK offshore wind supply chain and support the development of the sector. The action plan outlined in the document sets out a requirement to submit a supply chain plan as part of the bidding process for Contracts for Difference in order to encourage a high proportion of local content.

10.4.6 Local Economic Development Policy

10.4.6.1 National aspirations in relation to private sector-led economic growth and employment creation are echoed in the strategic aims of key organisations in both Local Impact Areas. Here, the focus of economic policy is in closing the gap between local and national economic performance.

New Anglia

10.4.6.2 New Anglia LEP's Strategic Economic Plan (SEP) identifies the offshore energy sector as a growth opportunity over the next decade, building on its existing capabilities. The main offshore wind activities are currently concentrated in the ports of Great Yarmouth and Lowestoft which have been established as one of six COREs. Parts of Great Yarmouth and Lowestoft have been given Assisted Area Status which enables increased support, and there are two Enterprise Zones established in the area to attract inward investment.

10.4.6.3 The energy sector in New Anglia has a long standing history of oil and gas, and is now expanding into offshore wind. New Anglia is well-positioned to capitalise on the rapid development of the renewables sector, with a number of significant offshore wind investments having taken place, as well as steps to promote and develop the sector. Offshore wind farms such as Scroby Sands, East Anglia ONE, and Sheringham Shoal to name a few, have drawn on ports and supply chain in New Anglia either for construction or operation activities.

10.4.6.4 The East of England Energy Group (EEGR) is well established in the area, and is working to develop the East of England Energy Zone.

10.4.6.5 Advanced manufacturing and engineering, agri-tech, ICT and digital creative, and the life sciences sector are also a priority for New Anglia. The LEP considers that growing these high-value sectors will play a vital role in merging the productivity gap which exists between the New Anglia LEP area and UK average. In addition to these, the sectors underpinning New Anglia's economic performance include ports and logistics, and tourism.

10.4.6.6 The SEP identifies the following targets between 2012 and 2026:

- Delivering 95,000 additional jobs;
- Creating 10,000 new businesses;
- Improving productivity by narrowing the gap in GVA per head with the UK average from 7.8% in 2012; and
- Delivering 117,000 new houses.

10.4.6.7 To implement these ambitions, the SEP identifies growth locations that accommodate the high impact priority sectors, and are expected to deliver employment and housing growth.

10.4.6.8 Furthermore, the establishment of the two Enterprise Zones (Beacon Park and South Denes) in Great Yarmouth borough is intended to support the development of the offshore energy sector and economic growth, attracting new businesses and job creation. The long term vision is to have 150-200 businesses across the two Enterprise Zone sites, directly creating 9,000 new jobs by 2025 and a further 4,500 jobs indirectly in the supply chains.

10.4.6.9 The strategic objectives of New Anglia's SEP are underpinned by Core Strategies of local authorities comprising the New Anglia LEP. The following strategies have been summarised that are particularly relevant for Hornsea Three, based on the location of ECR route and the location of ports in New Anglia (and therefore areas which may benefit from Hornsea Three):

- North Norfolk Core Strategy (North Norfolk District Council, 2008): North Norfolk's economy reflects its coastal location, with tourism and retail, as well as the rural economy, accounting for a large part of its economy. It has seen a decline in manufacturing and agricultural employment in recent years. Its indicative growth target is to see jobs growth of 4,000 between 2008 and 2021. It commits North Norfolk District Council to supporting development that has other employment generating proposals, including renewable energy plants;
- Broadland, Norwich and South Norfolk Joint Core Strategy (Greater Norwich Development Partnership, 2014): The urban area of Norwich is one of the largest in the East of England, and in 2007 was home to over 200,000 people (out of a total of 372,500 across all three districts). The influence of the Norwich City stretches into the neighbouring local authorities, which led to the development of a single Core Strategy for Broadland, Norwich and South Norfolk. The key drivers of growth across the three authorities are the need for housing as a result of smaller households and people living longer, as well as through inward migration from other parts of the country, with house building rates falling behind demand. The Strategy aspires to deliver 27,000 jobs and 37,000 additional homes between 2008 and 2026;
- Great Yarmouth Core Strategy (Great Yarmouth Borough Council, 2015): The borough of Great Yarmouth, which has a substantial coast line along the North Sea, which shapes the nature of its economy which is driven by the offshore energy sector, its port and tourism. There are two Enterprise Zones in the borough: Beacon Park and South Denes. These are expected to play a vital role in attracting new businesses into the area, growing the energy sector and creating employment. The long-term vision is to have 150-200 businesses across the two Enterprise Zones, directly creating 9,000 jobs by 2025 and a further 4,500 jobs indirectly; and
- Waveney District Council's Core Strategy (Waveney District Council, 2009). It targets Lowestoft as a place which will provide a national important cluster for renewable energy, citing its strong position for capitalising on the growth in offshore wind energy generation in the North Sea alongside pre-existing and planned developments there. The Core Strategy commits the Council towards a job target of up to 5,000 additional jobs over the Core Strategy period. Though aspirational, the Strategy states that job growth will be achieved partially through renewable energy.

The Humber

10.4.6.10 The Humber LEP covers four local authorities in the second Local Impact Area. The headline economic development aims of the Humber LEP centre on creating employment and growing the economy through focusing on key sectors and areas of opportunity (particularly those arising through the renewables sector).

10.4.6.11 The Humber LEP's strategic plan (Humber LEP, 2012) points towards an anticipation that renewable energy will play a central role in the economic development of the area. The Humber LEP notes that taking advantage of major growth opportunities such as renewable energy will be critical to realising the true potential of the Humber Estuary. The Humber LEP also notes that transport and logistics will play a key role in achieving their key economic objectives.

10.4.6.12 The plan (Humber LEP, 2012) cites opportunities emerging via offshore wind amongst the major economic opportunities currently on offer to the area and highlights a range of objectives to capitalise on and maximise local economic benefits from offshore wind developments. These objectives include:

- Establishing the Estuary as a prime national base for the development and maintenance of the offshore wind industry, and supporting the development of other renewable energy technologies around the Humber;
- Extending the distribution and assembly activities of the Estuary into manufacturing investment in the region;
- Ensuring that the infrastructure supporting the ports in terms of road, rail, air and inland water is aligned to port side investment; and
- Building on key strengths in steel, engineering and manufacturing.

10.4.6.13 The Humber LEP's draft European Structural Investment Fund Strategy (October 2013) outlines allocation plans for European Structural and Investment Funds for 2014-2020, worth €102.4 million. The overall vision is that the Humber region will become a leading national and international centre for renewable energy. The "SME Growth and Innovation Programme" looks to stimulate innovation and growth in low carbon goods and services. Furthermore, the "Skills Programme" plans to assist Humber residents to develop skills and to support the progress of the unemployed and economically inactive into employment.

10.4.6.14 The importance of the renewable energy sector to economic development objectives is reflected in the economic development strategies of some of the local authorities within the Humber LEP:

- East Riding Local Plan: Strategy Document (East Riding of Yorkshire Council, 2016). The importance of offshore wind energy to East Riding's wider strategic aims is reflected strongly in the plan. Policy EC5 indicates that proposals for the development of the energy sector (including wind developments) will be supported where any significant adverse impacts are avoided (or where adverse impacts have been minimalized or are outweighed by the benefits of the proposal). Under Policy S6 of the strategy, is a recommendation to support necessary employment land developments required to deliver offshore renewable energy projects;
- Hull Core Strategy Development Plan Document (Hull City Council, 2011): The core strategy for Hull identifies a role for the renewable energy sector in the city's economic development and regeneration. Development and investment priorities (Policy CS1) highlights the Port of Hull as a major economic development opportunity and indicates that developments here (and in other strategic areas) should maximise the potential to support identified growth sectors including renewable energy and manufacturing;
- North Lincolnshire Core Strategy 2006 to 2026 adopted June 2011 (North Lincolnshire District Council, 2011). The core strategy for North Lincolnshire identifies the south bank of the River Humber as a strategic employment site within Policy CS12 and underlines the importance of attracting and developing port-related employment. In addition to the clear aspiration that the offshore wind sector will make a major contribution to economic development across the Local Impact Area, local and Humber LEP wide strategies emphasise the importance of, and aspirations for, a number of other sectors. Many of these overlap with the renewables sector, for example the engineering and manufacturing sector is highlighted as strategically important across the Humber. In addition the ports and logistics sector is recognised within the Humber LEP as a key area of opportunity and strategic importance; and
- North East Lincolnshire Economic Strategy (North Lincolnshire District Council, 2016). The strategy identifies port and renewable energy as key priority sectors for growing the local economy. The sector presents an opportunity, building on the presence of major investments located in the area, including Morrisons, Siemens, DONG Energy and Centrica. The ambition is to establish the borough as a UK centre for renewable energy, working with the rest of the Humber to realise the potential of the Energy Estuary.

10.5 Consultation

10.5.1.1 Consultation on socio-economic issues has been ongoing with feedback captured in the community consultation events and feedback from the relevant local authorities. A summary of the key issues raised during consultation specific to socio-economics is outlined below, together with how these issues have been considered in the production of this PEIR.

Table 10.4: Summary of key consultation issues raised during consultation activities undertaken for Hornsea Three relevant to socio-economics.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
December 2016	PINS - Scoping Opinion	The Scoping Report does not set out a clear study area. The Scoping Report identifies that the study area is likely to be different depending on the receptor. the approach to establishing the study area should be clearly explained and justified in the ES.	The study area is clearly explained in section 10.3 and Figure 10.1 and 10.2.
December 2016	PINS - Scoping Opinion	The Secretary of State welcomes the cross-reference to other topic assessments with the potential to inform the assessment of socio-economics. This will help ensure that relevant matters are clearly covered and assessed.	Noted and cross references have been added to the chapter.
December 2016	PINS - Scoping Opinion	The information to form the baseline position is set out clearly in Table 12.15. Furthermore, the Secretary of State welcomes the upfront involvement of the Local Enterprise Partnership.	Noted. Hornsea Three intends to engage actively with the Humber and New Anglia LEPs as the project progresses leading into Examination.
December 2016	PINS - Scoping Opinion	The Secretary of State recommends that the types of jobs generated should be considered in the context of the available skills and workforce in the area. This applies equally to both construction and operational stages. The assessment should be carried out in consultation with the local authorities and LEP to ensure that the data used is up-to-date.	The match between the type and number of jobs available in the workforce in each of the Local Impact Areas will be considered as part of the assessment of the access to employment receptors during construction and O&M phases of Hornsea Three. The final Environmental Statement chapter will draw on further consultations with the LEP and local authorities that takes place.
December 2016	PINS - Scoping Opinion	Any mitigation necessary should be agreed with relevant stakeholders consulted upon prior to submission of a DCO application. The Secretary of Stata welcomes the use of a bespoke economic impact model to assess impacts in consultation with the LEP.	In the context of socio-economics, adopted mitigation measures are focused on maximising the benefits associated with Hornsea Three. Measures will be discussed and consulted on in the Environmental Statement. The assessment of impacts will be carried out using a bespoke impact model. Upcoming consultations with the LEPs will be drawn on in the Environmental Statement.
December 2016	Norfolk County Council (Scoping Opinion Response)	Commercial Fishing – The EIA/PEIR should consider the potential impact of the offshore scheme, including any underwater cable routes and other ancillary development, on Norfolk's commercial fishing interests. The EIA will need to consider the wider cumulative impacts taking into account existing operational wind farm; those under constructions; those consented and those in planning. The EIA should set out appropriate mitigation, and where necessary indicate what compensation, will be given to those commercial fishing interests in Norfolk adversely impacted by the operation of the wind farm and/or ancillary development. In addition the EIA should provide an indication of the likely impact on the local fishing industry particularly when other proposals are taken into account.	Matters related to commercial fishing are considered in volume 2, chapter 6: Commercial Fisheries, and other cable routes and other infrastructure is considered in volume 3, chapter 11: Infrastructure and Other Users of the PEIR. The PEIR considers potential cumulative impacts in each topic chapter.
December 2016	Norfolk County Council (Scoping Opinion Response)	Shipping/Navigation and Ports – The EIA should indicate that suitable navigation and shipping mitigation measures can be agreed with the appropriate regulatory bodies to ensure that Norfolk's Ports (King's Lynn and Wells) are not adversely affected by this proposal. The EIA will need to consider the wider cumulative impacts taking into account existing operational wind farm; those under constructions; those consented and those in planning.	Matters related to shipping and navigation are considered in volume 3, chapter 7: Shipping and Navigation. The PEIR considers potential cumulative impacts in each topic chapter.
December 2016	Norfolk County Council (Scoping Opinion Response)	Tourism – The EIA should consider the likely impacts on Norfolk's tourism sector.	Matters relating to land based tourism are considered in volume 3, chapter 5: Land Use, Agriculture and Recreation. Marine based recreational users are considered in volume 3, chapter 11: Infrastructure and Other Users. Potential impacts on tourism are also considered in this chapter in sections 10.10.2, 10.10.3, and 10.10.4.
December 2016	Norfolk County Council (Scoping Opinion Response)	Economic development - It would be helpful if the EIA/PEIR could provide accurate figures of those likely to be employed both during construction and once the Wind Farm is fully operational. There should also be a statement as to whether the labour would be sourced from local firms or if expertise would need to be imported to the region.	The PEIR sets out in section 10.9 the approach that will be used to calculate potential job creation through each phase of Hornsea Three, to inform the socio economic assessment that will be submitted as part of the final DCO application. DONG Energy continues to consider the number of construction and Operations and Maintenance jobs which are forecast to be generated by Hornsea Three. This matter will be considered further in the ES

10.6 Methodology to inform the baseline

10.6.1 Desktop study

10.6.1.1 The key sources of data used to assess the baseline environment include relevant national datasets from the ONS providing data on population, labour market and employment base conditions at the national and local levels.

10.6.1.2 The analysis draws on the most up to date sources of data available at March 2017 for all key socio-economic indicators although the year that the data relates to varies according to the release calendar for each dataset. The baseline year will therefore vary slightly across the indicators considered in the baseline. The data is considered as the best available representation of the baseline conditions for the purposes of the impact assessment. The baseline year for all indicators is referenced throughout the chapter but also included in Table 10.5.

Table 10.5: Summary of key data sources.

Economic indicator	Source	Year	Author
Population	ONS Mid-year population estimates	2015	ONS
Employment and economic activity	ONS Annual Population Survey	2016	ONS
Unemployment	ONS Annual Population Survey	2016	ONS
Job Seeker's Allowance	ONS Claimant Count	2017	ONS
Qualifications of residents	ONS Annual Population Survey	2016	ONS
Occupations of residents	ONS Annual Population Survey	2016	ONS
Sectoral and size band structure of the business base	ONS UK Business Counts	2016	ONS
Sectoral and size band structure of the employment base	ONS Business Register and Employment Survey	2015	ONS
Major employers	Offshore wind in Yorkshire and the Humber, and East Anglia	2016	RenewableUK
Trends in GVA of main industrial sectors	ONS Regional GVA estimates	2015	ONS
Workplace and residence based earnings	ONS Annual Survey of Hours and Earnings	2016	ONS
Review of existing attractions Tourist numbers	Tourism Volume and Value	2015	Visit Norfolk, Norfolk Tourism, Visit England

10.6.2 Site specific surveys

10.6.2.1 No site specific surveys were undertaken for socio-economics.

10.7 Baseline environment

10.7.1.1 The baseline conditions are assessed in turn for the two Local Impact Areas – New Anglia and the Humber LEPs. The two Local Impact Areas are characterised by different socio-economic characteristics, which form the context for the potential impact of Hornsea Three on the local economies. The uncertainties associated with Hornsea Three at this stage (e.g. the choice of port for construction and O&M activities) mean that it cannot be concluded where the socio-economic impacts will occur. Both areas contain ports and supply chains to have the potential to play a role in construction and O&M of Hornsea Three.

10.7.1.2 The selection of ports will be determined during a procurement exercise, and there are several factors which may influence the decision. This includes available capacity, facilities, access to the port from land and sea, local supply chains, and further commercial considerations.

10.7.1.3 This means that a possible outcome could be that both Humber and New Anglia LEP will be able to benefit from Hornsea Three to some extent, whether at different stages (ie construction and O&M), or simultaneously (eg providing different services.

10.7.1.4 Therefore, each of the economic characteristics are presented for New Anglia LEP and Humber LEP below to contextualise the potential of Hornsea Three to have an impact on each of the Local Impact Areas.

10.7.2 New Anglia LEP Local Impact Area

10.7.2.1 New Anglia LEP is a relatively large impact area, comprising 14 local authority districts. In the west, it overlaps with Greater Cambridgeshire and Peterborough LEP and the technology corridor, while in the east the LEP has a historic energy presence, with the offshore gas production and the emerging renewables sector. The Local Impact Area is therefore very diverse, and within it different localities face diverse challenges. This section explores in more detail the socio-economic characteristics within the New Anglia Local Impact Area.

Population structure

10.7.2.2 The New Anglia Local Impact Area has a population of over 1.6 million people, of which 969,000 are of working age. This represents 60%, which is lower than the national average of 63% of the population being of working age. The picture varies within the LEP: North Norfolk, for example, has a share of working age residents which is as low as 54% which could be due to its rural nature. Norwich, on the other hand, has 68% of residents that are of working age as it is a significant employment centre in New Anglia. The population structure for New Anglia LEP is summarised in Table 10.6.

Table 10.6: Population: total and working age, New Anglia LEP 2015.

Area	Population (000s)	Working Age Population (000s)	Working Age Population as % of Total
Babergh	89	51	58%
Breckland	135	80	59%
Broadland	127	74	59%
Forest Heath	64	40	62%
Great Yarmouth	99	58	59%
Ipswich	136	87	64%
King`s Lynn and West Norfolk	151	87	58%
Mid Suffolk	100	59	59%
North Norfolk	103	56	54%
Norwich	139	95	68%
South Norfolk	131	77	58%
St Edmundsbury	113	68	61%
Suffolk Coastal	125	71	57%
Waveney	116	66	57%
Total New Anglia LEP	**1627**	**969**	**60%**
United Kingdom	**65110**	**41241**	**63%**

Source: ONS Population Estimates 2015 (ONS, 2016a). Numbers are rounded to nearest 1,000.

Labour market indicators

10.7.2.3 Around 80% of New Anglia's working age population is economically active, outperforming the national average by two percentage points. Within New Anglia, there are areas of even higher economic activity, including urban areas of Norwich (86%) and St Edmunsbury (85%) and the more rural Broadland (81%), Suffolk Coastal (84%) and South Norfolk (86%).

10.7.2.4 These local authorities are also performing above average in terms of employment, with some significantly higher employment rates than the national 74%: South Norfolk and St Edmundsbury both have an employment of 84%, with Norwich and Suffolk Coastal with 81% and 82% respectively, with only four of the 14 local authorities with below average employment rates.

10.7.2.5 These include the coastal town of Great Yarmouth, which has lower than average economic activity rates (76%), and correspondingly employment (71%) compared to the rest of New Anglia. Its neighbouring district - North Norfolk – has the lowest economic activity and employment rates across New Anglia, 70% and 67% respectively. Breckland and Waveney both have an employment rate of 73%.

10.7.2.6 Labour market performance is set out in Table 10.7.

Table 10.7: Labour market performance, New Anglia LEP 2016.

Area	Economically active		In Employment		Economically inactive	
	Number (000s)	% Working Age Population	Number (000s)	% Working Age Population	Number (000s)	% Working Age Population
North Norfolk	39	70%	38	67%	17	30%
Great Yarmouth	45	76%	42	71%	14	24%
Waveney	51	78%	48	73%	14	22%
South Norfolk	65	86%	64	84%	11	14%
Broadland	59	81%	58	79%	14	19%
Breckland	61	77%	58	73%	18	23%
King`s Lynn and West Norfolk	68	79%	66	77%	18	21%
Suffolk Coastal	57	84%	56	82%	11	16%
Mid Suffolk	46	78%	44	74%	13	22%
St Edmundsbury	57	85%	56	84%	10	15%
Forest Heath	32	79%	32	79%	8	21%
Babergh	40	78%	39	76%	11	22%
Ipswich	67	78%	63	74%	19	22%
Norwich	81	86%	77	81%	14	14%
New Anglia	**768**	**80%**	**739**	**77%**	**192**	**20%**
United Kingdom	**31,840**	**78%**	**30,211**	**74%**	**9,143**	**22%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000.

10.7.2.7 Table 10.8 provides a snapshot of unemployment across New Anglia's local authorities. The average unemployment rate across the New Anglia Local Impact Area is 3.5%, below the national level of 5%. This suggests there is limited capacity in the labour market and New Anglia is close to a level which is generally considered by UK Government economists to represent full employment (around two to three percent). Currently there are 28,000 people unemployed across New Anglia, a large share of whom are in Norwich (4,000) and Ipswich (4,000).

Table 10.8: Unemployment, New Anglia LEP 2016.

Area	Number unemployed (000s)	Unemployment rate (% econ. active population)
Babergh	1	3.3%
Breckland	2	3.5%
Broadland	2	3.0%
Forest Heath	1	2.6%
Great Yarmouth	3	6.0%
Ipswich	4	5.0%
King`s Lynn and West Norfolk	3	3.7%
Mid Suffolk	2	3.3%
North Norfolk	2	3.9%
Norwich	4	4.9%
South Norfolk	2	2.8%
St Edmundsbury	2	3.2%
Suffolk Coastal	2	2.7%
Waveney	3	5.3%
New Anglia	**28**	**3.5%**
United Kingdom	**1,645**	**5.0%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000.

10.7.2.8 A more up to date measure of unemployment is the claimant count data, which measures the number of people claiming out of work benefits[1]. Figure 10.3 represents shows the average number of claimants annually between 2006 and 2016. It is evident that claimant numbers decreased drastically since 2012, and in 2016 there were around 12,600 claimants in New Anglia, representing 1.3% of the working age population. This is below the national rate of 1.9%, as has been the case historically.

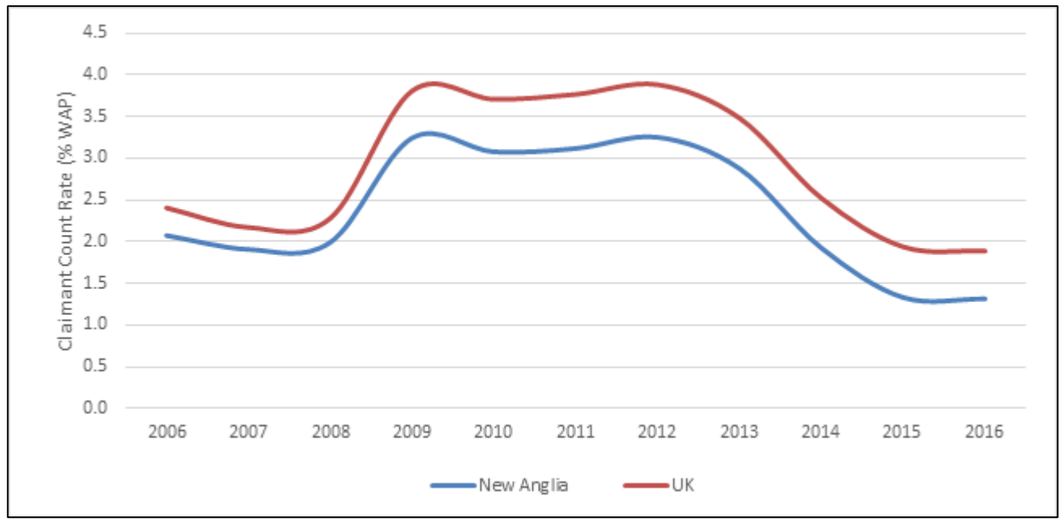


Figure 10.3: Claimant count rate, 2006-2016.

Source: ONS, Job Seeker's Allowance 2006-2012, ONS Claimant Count 2013-2017 (ONS, 2013; ONS, 2017).

10.7.2.9 The skills profile of New Anglia's residents is below the national average in terms of proportion of working age population with higher level skills (i.e. level four and above): 28% of local residents have higher level skills compared to almost 37% across the UK.[2] However, there are some significant variations within New Anglia itself (see Table 10.9):

- Norwich has got the highest concentration of higher level skills (Level 4+), with 39% of working age population educated to degree level or above. Great Yarmouth, however, is at the other end of the spectrum with 17% of working age residents qualified to level four and above.

[1] Since January 2013, the number of people claiming Job Seeker's Allowance and Universal Credit have been combined. Therefore the analysis combines the two sources to provide an accurate measure of labour market capacity from 2013 onwards.

[2] Qualification levels are defined as follows: Level 4+ diploma of higher education or above; Level 3 two or more AS and A levels, NVQ level 3 or BTEC level 3. Level 1 and 2 GCSEs, up to BTEC first diploma.

- The proportion of people with no qualifications in New Anglia is similar to that in the UK, with 9% in both areas. Some local authorities within the area have a higher representation of these, most notable Forest Heath (18%).

Table 10.9: Qualifications of working-age residents, higher level and no qualifications, New Anglia LEP 2016.

Area	Level 4+		Level 3		Apprenticeships		Level 1 and 2		No Qualifications	
	Number	%	Number	%	Number	%	Number	%	Number	%
Babergh	12	23%	8	16%	3	5%	19	38%	5	9%
Breckland	22	28%	11	14%	3	4%	22	29%	8	11%
Broadland	23	31%	13	18%	4	5%	27	36%	3	4%
Forest Heath	11	27%	6	14%	1	3%	9	21%	7	18%
Great Yarmouth	10	17%	12	20%	*	*	24	40%	4	8%
Ipswich	19	23%	15	17%	3	3%	34	39%	10	11%
King`s Lynn and West Norfolk	20	23%	18	21%	3	3%	28	33%	12	14%
Mid Suffolk	17	29%	12	20%	2	4%	18	30%	6	10%
North Norfolk	13	23%	8	14%	2	4%	22	40%	6	11%
Norwich	37	39%	15	16%	3	3%	27	29%	6	7%
South Norfolk	24	31%	14	19%	4	5%	24	30%	7	9%
St Edmundsbury	22	34%	17	25%	1	2%	16	25%	5	8%
Suffolk Coastal	25	37%	11	17%	3	4%	20	30%	3	4%
Waveney	14	21%	13	20%	4	6%	25	38%	6	9%
New Anglia	**268**	**28%**	**172**	**18%**	**36**	**4%**	**313**	**33%**	**88**	**9%**
United Kingdom	**15,023**	**37%**	**6,928**	**17%**	**1,345**	**3%**	**11,224**	**28%**	**3,579**	**9%**

Source: ONS, Annual Population Survey 2015 (ONS, 2016b). Numbers are rounded to nearest 1,000. *data unavailable due to small sample size

10.7.2.10 The occupations profile of New Anglia's residents is representative of the skills profile described in Table 10.10[3]. A smaller proportion of residents are employed in high skill occupations than nationally (28% compared to 31% in the UK). There are significant spatial differences within New Anglia: South Norfolk (37%), Broadland (35%), Suffolk Coastal (35%) and Babergh (34%) are the top performers in shares of employment in high skill occupations.

Table 10.10: Occupations of working age residents, New Anglia LEP 2016.

Area	High skill occupations		Medium skill occupations		Low skill occupations	
	Number	%	Number	%	Number	%
Babergh	14	34%	16	37%	12	30%
Breckland	17	26%	25	39%	22	35%
Broadland	22	35%	20	33%	19	32%
Forest Heath	9	26%	*	*	14	43%
Great Yarmouth	11	25%	12	27%	21	48%
Ipswich	18	27%	20	30%	28	42%
King`s Lynn and West Norfolk	17	24%	22	32%	29	42%
Mid Suffolk	12	26%	20	42%	15	32%
North Norfolk	11	25%	16	37%	16	38%
Norwich	21	27%	23	30%	34	43%
South Norfolk	25	37%	22	33%	20	29%
St Edmundsbury	14	24%	23	39%	21	37%
Suffolk Coastal	21	35%	21	35%	18	31%
Waveney	9	19%	16	33%	23	46%
New Anglia	**219**	**28%**	**264**	**34%**	**292**	**37%**
United Kingdom	**9596**	**31%**	**11002**	**35%**	**10666**	**34%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000. *data unavailable due to small sample size

[3] Occupations are defined as: High skill occupations are defined as managers, directors and senior officials; and professional occupations. Medium skill occupations are defined as associate professional and technical occupations; administrative and secretarial occupations; and skilled trades occupations. Low skill occupations are defined as caring, leisure and other service occupations; sales and customer service occupations; process, plant and machine operatives; and elementary occupations.

10.7.2.11 The proportion of residents in low skill professions is overrepresented across New Anglia: 37% of working age residents compared to 34% nationally. This is particularly evident in Great Yarmouth, where almost half of residents are in low skill professions (48%).

Sectoral structure of employment base

10.7.2.12 There are almost 655,000 employees across New Anglia, distributed across the 14 local authorities. The largest shares of jobs fall into the urban areas of the LEP: Norwich (13%) and Ipswich (11%), followed by St Edmunsbury (9%).

10.7.2.13 Analysis of jobs densities (i.e. number of jobs for every 1,000 working age residents) shows New Anglia is underperforming, with 676 jobs compared to the national 712 jobs for every 1,000 of the Working Age Population. The urban areas mentioned earlier which account for larger shares of New Anglia's employment, outperform the national job densities, with Norwich having 200 more jobs than Great Britain on average. Ipswich and St Edmunsbury paint a similar picture, with job densities of 801 and 896 respectively.

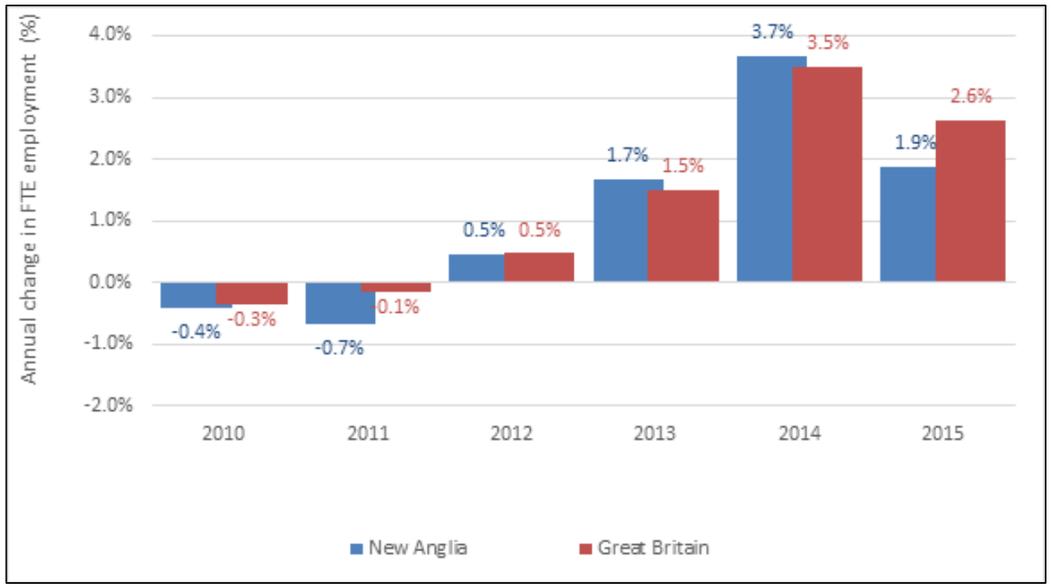
10.7.2.14 The lowest job densities are observed in North Norfolk (546), Mid Suffolk (569) and King's Lynn and West Norfolk (591). These local authorities each account for 5% of New Anglia's employee numbers in North Norfolk and Mid Suffolk, and 8% in King's Lynn and West Norfolk (see Table 10.11).

Table 10.11: Employment and employment density in New Anglia LEP, 2015.

Area	Total Number of Employees (000s)	% of Employees in New Anglia	Employment Density (Jobs per 1,000 working age residents)	FTE Number of Employees (000s)
Babergh	31	5%	596	25
Breckland	48	7%	597	41
Broadland	45	7%	602	38
Forest Heath	24	4%	596	20
Great Yarmouth	37	6%	633	30
Ipswich	69	11%	801	57
King`s Lynn and West Norfolk	52	8%	591	43
Mid Suffolk	34	5%	569	29
North Norfolk	31	5%	546	25
Norwich	87	13%	918	71
South Norfolk	50	8%	649	41
St Edmundsbury	61	9%	896	51
Suffolk Coastal	49	7%	689	41
Waveney	40	6%	602	32
New Anglia	**655**	N/A	**676**	**544**
Great Britain	**28,531**	N/A	**712**	**24,125**

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

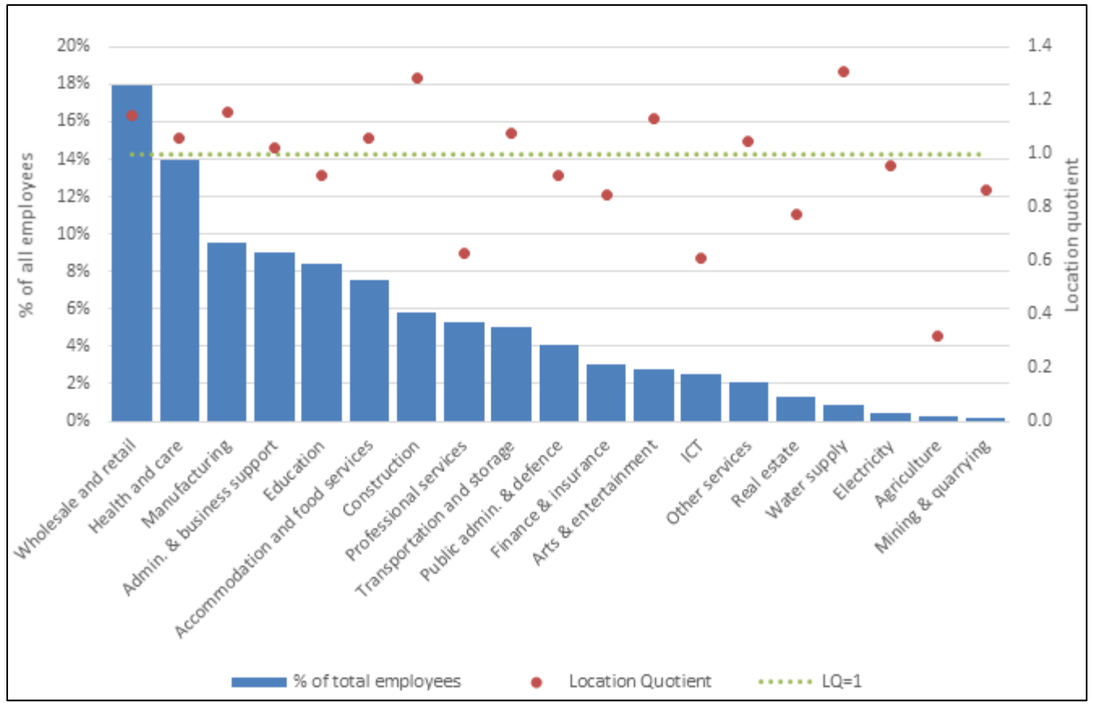
10.7.2.15 The number of employees in New Anglia equates to around 544,000 full-time equivalent jobs. This level of full time equivalent (FTE) employment has followed a similar pattern of growth as Great Britain on the whole, although the overall change since 2009 has been a 7% increase in FTE jobs in New Anglia compared to 8% in Great Britain as shown in Figure 10.4.



Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c).

Figure 10.4: Employment trends (FTE), 2010-2015.

10.7.2.16 Figure 10.5 illustrates the sectoral composition of employment in New Anglia, and the concentration of employment relative to Great Britain as measured by the value of a location quotient (LQ). The largest employment sector in the area is wholesale and retail, accounting for 18% of employment numbers (or 117,000 jobs), followed by health and care (14% or 92,000 jobs). These sectors are typically considered low value, and according to LQs are slightly overrepresented in New Anglia compared to Great Britain.



Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c).

Figure 10.5: Sectoral distribution of employment, New Anglia LEP 2015.

Earnings and wealth generation

10.7.2.17 Earnings in New Anglia are below the national average as demonstrated by median gross annual earnings data: residents earn £1,200 less per annum, while workplace earnings are £2,000 below the UK level.[4] As with other indicators, there is significant variation between the local authorities in New Anglia as shown in Table 10.12:

- Suffolk Coastal outperforms the LEP and national level earnings on both fronts, resident (£31,800) and workplace (£30,500) earnings. South Norfolk has a higher than average resident earnings (£30,100) but lower workplace earning (£27,100) suggesting residents commute outside of the area to work.
- Great Yarmouth and North Norfolk have among the lowest resident earnings in the area, with higher workplace earnings. This suggests local residents are not able to access the higher paid jobs and are losing out to people who come in from elsewhere to work in the district.

Table 10.12: Resident and workplace median earnings for full-time employees (gross annual), New Anglia LEP 2016.

Area	Residence based earnings (£)	Workplace based earnings (£)
Babergh	*	*
Breckland	24,200	23,800
Broadland	27,200	23,900
Forest Heath	24,400	*
Great Yarmouth	25,000	28,900
Ipswich	26,800	28,300
King`s Lynn and West Norfolk	26,400	26,100
Mid Suffolk	27,100	25,100
North Norfolk	23,300	25,800
Norwich	26,100	27,500
South Norfolk	30,100	27,100
St Edmundsbury	27,200	26,100
Suffolk Coastal	31,800	30,500
Waveney	24,000	23,900

[4] Residence-based earnings provide data for employees who are living in the area; workplace earnings provide earnings for employees who are working in the area.

Area	Residence based earnings (£)	Workplace based earnings (£)
New Anglia	**27,000**	**26,200**
United Kingdom	**28,200**	**28,200**

Source: ONS, Annual Survey of Hours and Earnings 2016 (ONS, 2016d). * Data is not available due to small sample sizes.

10.7.2.18 Data on New Anglia's GVA contributions is available at a Nomenclature of Territorial Units for Statistics (NUTS) 3 level. New Anglia contributes £35 billion GVA to the UK economy annually, equivalent to around 2% of the national economy. Within the New Anglia Local Impact Area, Suffolk is the biggest contributor (£9.4 billion), followed by Norwich and East Norfolk (£4.5 billion), which once again highlights the urban-rural divide within the Local Impact Area.

10.7.2.19 The area exhibits below average productivity levels as measured by GVA per head across all locations. This may be attributed to employment being concentrated in low value sectors. Within New Anglia there is a gap between Suffolk and Norwich and East Norfolk and the rest of the Local Impact Area (see Table 10.13).

Table 10.13: GVA and GVA per head, 2015.

Area	Total GVA (£millions)	GVA per head (£)
Suffolk	9,417	22,781
Norwich and East Norfolk	4,527	23,338
North and West Norfolk	2,712	18,647
Breckland and South Norfolk	2,569	19,903
New Anglia	**35,446**	**21,800**
United Kingdom	**1,666,342**	**25,601**

Source: ONS, Sub-regional GVA 2015 (ONS, 2016e).

New Anglia supply chain capacity and capability

10.7.2.20 New Anglia already has a presence of offshore wind activities, building on the historic offshore gas production. Currently, there are several offshore wind projects taking place off the east coast. These include the East Anglia ONE Offshore Wind Farm which is about to commence into the construction phase, and Galloper Offshore Wind Farm which is under construction.

10.7.2.21 The area is home to a spectrum of supply chain companies, such as Seajacks and 3Sun, as well as companies based at OrbisEnergy – the specialist innovation and incubation centre in Lowestoft (RenewableUK, 2016). Great Yarmouth and Lowestoft in particular are the Local Impact Area's energy-focused locations, with dedicated Enterprise Zones to attract and develop energy supply chains. Great Yarmouth has been selected the site for Statoil's Operations Centre for Dungeon Offshore Wind Farm, and the port of Lowestoft will be used as the construction base for Galloper Offshore Wind Farm. Moreover, Siemens have set up a base in Great Yarmouth as an assembly location and installation base to support the development of the sector.

10.7.2.22 As outlined in the policy review, New Anglia is home to one of six Centres for Offshore Renewables Engineering in Great Yarmouth and Lowestoft which are designed to attract investment in wind farm assembly and manufacturing.

Key supply chain sectors in New Anglia

10.7.2.23 There are several sectors in New Anglia that could be impacted by supply chain opportunities during construction and O&M phases of Hornsea Three. The sectors are presented in Table 10.14 along with national and local employment size of the sectors. The sectors have been defined using best-fit SIC code mapping to reflect the supply chain activities, therefore it is important to note the limitations of this type of analysis: firstly, it is not able to distinguish the companies that are already in the supply chain for offshore wind, nor their capacity to take part in the supply chain for Hornsea Three. Nevertheless, it is a useful indication of potential capabilities locally.

10.7.2.24 Manufacturing and construction are the largest in employment terms, with 43,000 and 38,000 workers respectively in New Anglia. These sectors represent a larger share of employment in New Anglia compared to nationally which is also reflected in the LQ values. Given the presence of key industry players in the area (as discussed earlier) local businesses and workers could benefit from accessing these opportunities.

Table 10.14: Number of employees in key strategic sectors in Great Britain and New Anglia LEP, 2015.

Sector	Great Britain Employees (000s)	Great Britain % of Total	New Anglia Employees (000s)	New Anglia % of total	New Anglia LQ
Manufacturing	1,406	5%	43	6%	1.3
Construction	1,295	5%	38	6%	1.3
Land based transport	994	3%	27	4%	1.2
Engineering	940	3%	20	3%	0.9
Energy Generation	297	1%	6	1%	0.9
Marine Transport	14	0%	0.4	0%	1.3

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000.

10.7.2.25 Table 10.15 shows a more detailed breakdown of the sectors with supply chain opportunities, with respective employment presented on FTE basis to better reflect the size of each sub-sector. The main sector activities summarised include:

- Manufacturing and engineering sectors: in particular the manufacture of fabricated metal products (for example as part of the supply chain for the turbine towers), manufacture of electric wires and cables, manufacture of electric motors, generators (for example to supply components for sub stations) and turbines;
- Construction sectors: the more specialist construction sectors and those relating to construction of floating structures, ships and boats are most likely to be affected by Hornsea Three;
- Land and marine transport sectors: sea and coastal water transport and ancillary services will be key sectors along with other land-based forms of transport;
- Professional services: a range of technical consultancy services will be required throughout the construction and O&M of Hornsea Three (e.g. to remotely monitor Hornsea Three once operational).
- Accommodation and food services: short stay accommodation, restaurants, bars and other services will likely be serving workers coming into the area from elsewhere.

Table 10.15: Employment in sectors with supply chain opportunities for construction and operation and maintenance, New Anglia 2015.

Sector	Great Britain FTEs (000s)	New Anglia FTEs (000s)	New Anglia LQ vs Great Britain
Manufacturing:			
Fabricated metal products	49	0.7	0.7
Motors, generators, transformers etc.	30	0.5	0.8
Wiring and wiring devices	15	0.4	1.2
General purpose machinery	54	1.4	1.1
Construction sectors:			
Building of ships and boats	32	1.0	1.4
Other civil engineering projects	107	2.7	1.1
Transport sectors:			
Freight transport by road	215	7.7	1.6
Sea and coastal freight water transport	6	0.2	1.4
Support activities for transportation	224	7.9	1.6
Professional services:			
Management consultancies	411	5.5	0.6
Architectural, engineering consultancy	427	6.5	0.7
Other professional, scientific and technical	84	1.6	0.9
Accommodation and food services			
Accommodation	340	10.8	1.5
Food and beverage services	1130	23.7	1.0
Other sectors:			
Electric generation, transmission, distribution	77	2.4	1.4
TOTAL	**3202**	**73**	-

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000.

10.7.2.26 New Anglia's manufacturing-related supply chain sectors show an employment base of around 3,000 FTE jobs. The manufacturing of wiring devices and general purpose machinery are more concentrated than nationally, although not to a large extent. New Anglia shows specialisms in the transportation sectors (LQ of 1.4 to 1.6) and accommodation (LQ of 1.5), reflecting the tourism element of the economy and electricity-related activities. As New Anglia is a relatively large area consisting of 14 local authorities, it is likely that concentrations of activity linked to offshore wind developments are not adequately reflected using this type of analysis.

Tourism sector

10.7.2.27 Tourism is an important sector within New Anglia, underpinning substantial employment in the area and attracting wealth generation through tourism expenditure. The Tourism Impact Area focuses on the local authorities of Broadland, North Norfolk and South Norfolk. The area's visitor economy relies on its natural assets, such as the Broads National Park, North Norfolk Coast and Salthouse Marshes.

10.7.2.28 North Norfolk attracts coastal tourism as visitors come to enjoy the Norfolk Coast AONB, the beaches, coastal birdlife, the Broads Natural Park and the countryside (North Norfolk District Council, 2008). Rural towns such as Cromer and Sheringham provide accommodation for tourists.

10.7.2.29 The Tourism Impact Area is home to Broads Natural Park, which spans across Broadland, North Norfolk, South Norfolk and beyond into Norwich, Waveney and Great Yarmouth. It contains landscapes, lakes and rivers that attract around 8 million visitors annually (Broads Authority, 2017).

10.7.2.30 Tourism is estimated to support 44,000 FTE jobs across New Anglia (8% of total), of which 9,000 are in the Tourism Impact Area. Tourism-related employment accounts for the largest share in North Norfolk, representing approximately 1 in 6 FTE jobs (see Table 10.16).

Table 10.16: Tourism FTE Employment, 2015.

	Full time jobs (000s)	Part time jobs (000s)	FTE jobs (000s)	% of FTE employment
Broadland	2	2	3	7%
North Norfolk	2	3	4	16%
South Norfolk	1	2	2	6%
New Anglia	**26**	**37**	**44**	**8%**
Great Britain	**1,206**	**1,375**	**1,893**	**8%**

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000.

10.7.2.31 Research by Visit Britain provides information on visitor volume and value, as well as the characteristics of tourism in the area. The main sources of information are the GB Day Visitor Survey and the GB Tourism Survey, which collect information on day and overnight visitors respectively. The findings for the smaller geographical areas should be treated with caution, as standard errors increase the more disaggregated the data gets. Nevertheless, in the absence of other data sources the surveys provide useful insight into the scale and type of tourism in the local area.

10.7.2.32 Tourism data on volume and value shows there are on average 57 million visits to New Anglia per year, attracting around £2.6 billion of expenditure. Of this, around 11 million visitors come to the Tourism Impact Area annually, spending more than £416 million in the local economy. The volume and value of tourism in North Norfolk stands out as it accounts for 60% of visits in the Tourism Impact Area (see Table 10.17).

Table 10.17: Tourism Volume and Value, 2015.

Area	Day visits		Overnight tourism	
	Visits (millions)	Expenditure (£millions)	Visits (millions)	Expenditure (£millions)
Broadland	2	39	0.1	35
North Norfolk	6	117	0.7	155
South Norfolk	2	53	0.1	17
New Anglia	53	1,721	4	876

Source: Visit Britain (2016a).

10.7.2.33 Further analysis into visitors by type reveals that holiday visits make up the largest share of staying visitors, and therefore bring in the largest share of expenditure (see Table 10.18).

Table 10.18: Overnight Tourism Volume and Value by Visit Type, 2015.

Area	Holiday		Visiting friends and relatives		Business visitors	
	Visits (millions)	Expenditure (£millions)	Visits (millions)	Expenditure (£millions)	Visits (millions)	Expenditure (£millions)
Broadland	0.1	32	0.03	3	-	-
North Norfolk	0.5	134	0.1	11	0.03	3.0
South Norfolk	0.1	12	0.1	4	0.01	1.0
New Anglia	**2**	**631**	**1**	**140**	**0.4**	**80**

Source: Visit Britain (2016a).

10.7.2.34 Visit Britain also collects data on visits to tourist attractions across the county. Top 10 attractions in the Tourist Impact Area are presented in Table 10.19**.** The list is dominated by attractions based in North Norfolk, which is not surprising considering the scale of the visitor economy in North Norfolk compared to Broadland and South Norfolk. Together, the top 10 attractions were visited by almost 1 million visitors in 2015.

Table 10.19: Top 10 Visitor Attractions in Local Impact Area by Number of Visitors, 2015.

Attraction	Number of visitors (2015)	District
Dinosaur Adventure	259,000	Broadland
The Poppy Line (North Norfolk Railway)	165,900	North Norfolk
Blickling Hall, Gardens and Park	159,000	Broadland
Felbrigg Hall, Garden and Park	115,300	North Norfolk
Pensthorpe Nature Reserve & Gardens	95,000	North Norfolk
Wells and Walsingham Light Railway	55,000	North Norfolk
RNLI Henry Blogg Museum	48,700	North Norfolk
Holt Country Park	32,000	North Norfolk
Walsingham Abbey Grounds	31,000	North Norfolk
The Muckleburgh Collection	28,300	North Norfolk

Source: Visit Britain (2016b).

10.7.2.35 Norfolk Tourism SWOT research for Visit Norfolk published in 2014 provides a useful overview of the sector in the area despite being a few years old (Visit Norfolk, 2014). Norfolk's visitor economy is highly seasonal, and mainly runs from April to September. Winter months appear to be the quietest, and the time from November to February only accounts for 7% of all visits. The same report suggests that holiday parks are the most common choice of accommodation by visitors to Norfolk (23% of visitors), followed by B&B and guesthouses (13%) and self-catering accommodation (12%).

10.7.2.36 In relation to the assessment of visual and noise impacts on coastal tourism, there is a limited body of evidence relating to the extent to which offshore wind farms impact upon tourism. Much of the available evidence base draws on survey research of visitors and tourism businesses, and relates to anticipated impacts on tourism behaviour. This leads to a level of uncertainty about the scale of potential impacts, particularly as the evidence base is mixed and findings vary across studies.

10.7.2.37 The literature does however indicate that wind farm developments will not have a significant effect on the overall volume and value of tourism activity in most instances. All studies suggest that the majority of visitors do not expect their behaviour to be influenced (either positively or negatively) by the presence of wind farm developments (see for example University of the West of England, 2004; Ipsos MORI, 2014; NWP, 2002; Glasgow Caledonian University, 2008).

10.7.2.38 While the research points towards potential for some visitors to be discouraged from making future visits to an area affected by a wind farm development, this is usually balanced (and in some cases exceeded) by visitors reporting that they will visit more frequently. This conclusion is reinforced by research studies which have assessed the impacts post development, pointing towards there being no evidence of significant lasting impact of wind farm development and operation (either positive or negative) on tourism (as observed for example by Gossop, 2007).

10.7.2.39 There are a complex range of factors which explain the attitudes of visitors to wind farm development and the consequences upon visiting behaviour. There is a need to be cautious in generalising but the evidence base points towards a tendency for younger people and those in higher socio-economic groups (see for example Devine-Wright, 2007) to be more accepting of wind farm development, in part influenced by their wider attitudes towards renewable energy and its role in addressing climate change. The most recent survey by Ipsos MORI (2014) found that 76% of the 1,749 UK adults surveyed, who had heard of wind farms, supported their development. Although this report did not specifically survey tourists, it is still indicative of a generally positive outlook towards the construction of wind farms, whereby visiting areas with such an infrastructure should not deter most people from visiting.

10.7.2.40 The research base does not suggest that the extent to which tourists are attracted to an area by the quality of the landscape is important in determining visitors' reactions to wind farm developments.

10.7.2.41 Overall, the evidence outlined above suggests that offshore wind farm developments generate very limited, or no negative impact on tourist and recreational users during the construction and O&M phases.

10.7.3 Humber LEP Local Impact Area

10.7.3.1 Humber LEP is a built-up area with an industrial heritage. Historically, it suffers from socio-economic challenges, such as pockets of unemployment and deprivation affecting areas which have experienced industrial decline. Despite these challenges, the LEP has a strong and growing renewable energy sector. As outlined in the policy section, this is a focal point for economic development activity. Humber LEP has seen significant investments in recent years to develop its offshore wind sector and enhanced its potential to benefit from Hornsea Three. The socio-economic position of Humber LEP is examined in more detail below.

Population structure

10.7.3.2 The Humber LEP Local Impact Area has a population of over 925,000 people, of whom 572,000 are working age. The working age population across Humber LEP represents around 62% of the total, just under the national average of 63%. The proportion of working age residents varies between the local authorities in the Humber, from 59% in the East Riding of Yorkshire to 66% in the City of Kingston upon Hull (see Table 10.20).

Table 10.20: Population: total and working age, Humber LEP 2015.

Area	Population (000s)	Working Age Population (000s)	Working Age Population as % of Total
East Riding of Yorkshire	337	199	59%
Kingston upon Hull, City of	259	171	66%
North East Lincolnshire	160	98	61%
North Lincolnshire	170	104	61%
Humber LEP	**925**	**572**	**62%**
United Kingdom	**65110**	**41241**	**63%**

Source: ONS Population Estimates 2015 (ONS, 2016a). Numbers are rounded to nearest 1,000.

10.7.3.3 The Local Impact Area has experienced a population growth of 1% between 2010 and 2015, however, the number of working age residents fell by almost 14,000 people (or 2%), despite increasing nationally.

Labour market indicators

10.7.3.4 The Humber's labour market performance is comparable to national indicators: the Local Impact Area's economic activity rate of 77% is one percentage point below the UK average as is the employment rate of 73%. Spatially, East Riding of Yorkshire shows the strongest labour market performance across the area, with economic activity rate of 81% and an employment rate of 78%. The other three local authorities are below the UK average, particularly Kingston upon Hull.

10.7.3.5 The levels of economic inactivity follow the same spatial pattern, one percentage point above the UK average across the Humber (23%). Kingston upon Hull has highest inactivity levels, with more than a quarter of working age residents being inactive.

Table 10.21: Labour market performance, Humber LEP 2016.

Area	Economically active		In Employment		Economically inactive	
	Number (000s)	% Working Age Population	Number (000s)	% Working Age Population	Number (000s)	% Working Age Population
East Riding of Yorkshire	161	81%	154	78%	37	19%
Kingston upon Hull, City of	125	74%	114	68%	44	26%
North East Lincolnshire	76	77%	71	72%	22	23%
North Lincolnshire	79	76%	74	70%	25	24%
Humber	**441**	**77%**	**413**	**73%**	**128**	**23%**
United Kingdom	**31,840**	**78%**	**30,211**	**74%**	**9,143**	**22%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000.

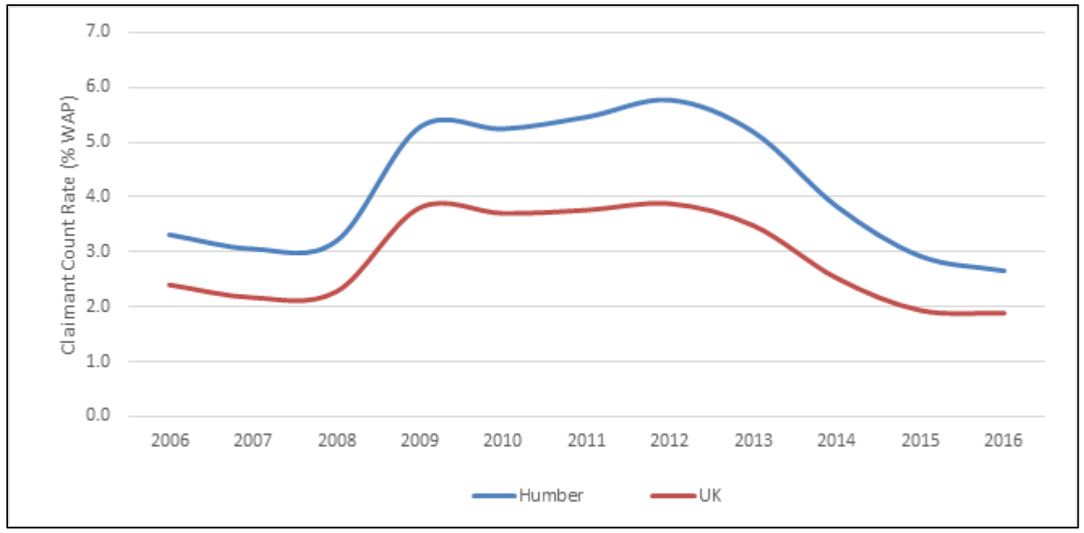
10.7.3.6 The Humber exhibits higher unemployment rates than the UK as whole: 6.3% compared to the national 5%. This suggests there is some capacity in the labour market, particularly in Kingston upon Hull where the unemployment rate is over 8%.

Table 10.22: Unemployment, Humber LEP 2016.

Area	Number unemployed	Unemployment rate (% econ. active population)
East Riding of Yorkshire	7	4.0%
Kingston upon Hull, City of	11	8.2%
North East Lincolnshire	5	6.7%
North Lincolnshire	5	6.1%
Humber	**29**	**6.3%**
United Kingdom	**1,645**	**5.0%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000.

10.7.3.7 Data from Claimant Count is presented in Figure 10.6 , demonstrating the falling number of claimants over the last ten years across the UK and the Humber. However, the number of claimants in the Humber as a proportion of the working age population is consistently higher than the national average. In 2016, there were on average 15,300 claimants throughout the year, representing 2.7% of the working age population – this compares to 1.9% nationally.



Source: ONS, Job Seeker's Allowance 2006-2012, ONS Claimant Count 2013-2017 (ONS, 2013; ONS, 2017).

Figure 10.6: Claimant count rate, 2006-2016.

10.7.3.8 The skills profile of working age residents across the Humber (Table 10.23) shows significant underperformance in higher level skills as compared to the position at UK level: 28% of working age residents in the Humber have higher level skills (i.e. Level 4+) compared to 37% across the UK[5]. The underperformance is consistent across all local authorities within the Humber, although the East Riding of Yorkshire has the highest representation of higher level skills of 35%.

10.7.3.9 In all other skill levels, Humber LEP has a larger share than the UK, including the proportion of working age residents with no qualifications (10% in Humber compared to 9% across the UK).

[5] Qualification levels are defined as follows: Level 4+ diploma of higher education or above; Level 3 two or more AS and A levels, NVQ level 3 or BTEC level 3. Level 1 and 2 GCSEs, up to BTEC first diploma.

Table 10.23: Qualifications of working-age residents, higher level and no qualifications, Humber LEP 2016.

Area	Level 4+		Level 3		Apprenticeships		Level 1 and 2		No Qualifications	
	Number	%	Number	%	Number	%	Number	%	Number	%
East Riding of Yorkshire	70	35%	38	19%	9	5%	58	29%	15	8%
Kingston upon Hull, City of	37	22%	35	21%	9	5%	52	31%	21	13%
North East Lincolnshire	23	24%	18	19%	4	5%	33	33%	11	11%
North Lincolnshire	28	27%	19	18%	7	6%	32	31%	8	8%
Humber	**158**	**28%**	**109**	**19%**	**29**	**5%**	**175**	**31%**	**56**	**10%**
United Kingdom	**15,023**	**37%**	**6,928**	**17%**	**1,345**	**3%**	**11,224**	**28%**	**3,579**	**9%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

10.7.3.10 The occupational profile of residents mirrors the representation of skills: a quarter of Humber residents are in high skill occupations, six percentage points below the national average. Unsurprisingly, the proportion of residents in medium and low skill occupations is higher, particularly in low skills (39% in Humber compared to 34% in the UK).

10.7.3.11 Within Humber, East Riding of Yorkshire has got the highest proportion of residents in high level occupation equivalent to 28%, albeit still below the national 31%. North East Lincolnshire stands out as having the least skilled occupation profile, with only a fifth of residents in high skill and 44% in low skill occupations.

Table 10.24: Occupations of working age residents, Humber LEP 2016.

Area	High skill occupations		Medium skill occupations		Low skill occupations	
	Number	%	Number	%	Number	%
East Riding of Yorkshire	45	28%	63	39%	54	33%
Kingston upon Hull, City of	27	23%	39	33%	49	42%
North East Lincolnshire	15	20%	26	35%	32	44%
North Lincolnshire	19	24%	26	34%	31	41%
Humber	**106**	**25%**	**154**	**36%**	**167**	**39%**
United Kingdom	**9,596**	**31%**	**11002**	**35%**	**10666**	**34%**

Source: ONS, Annual Population Survey 2016 (ONS, 2016b). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

Sectoral structure of employment base

10.7.3.12 There are 373,000 people employed across Humber, with East Riding of Yorkshire and Kingston upon Hull accounting for two thirds of the Local Impact Area's employees.[6] This number of employees in Humber equates to around 312,000 FTE jobs. Employment density in the Humber is around 650 jobs for every 1,000 working age residents, which is below the national average by 60 jobs for every 1,000 residents.

10.7.3.13 East Riding of Yorkshire shows the lowest employment density of the local authorities in Humber despite accounting for almost a third of the Local Impact Area's employment with 593 jobs per 1,000 residents. Kingston upon Hull on the other hand is closest to the national average, with 692 jobs for every 1,000 working age residents (see Table 10.25).

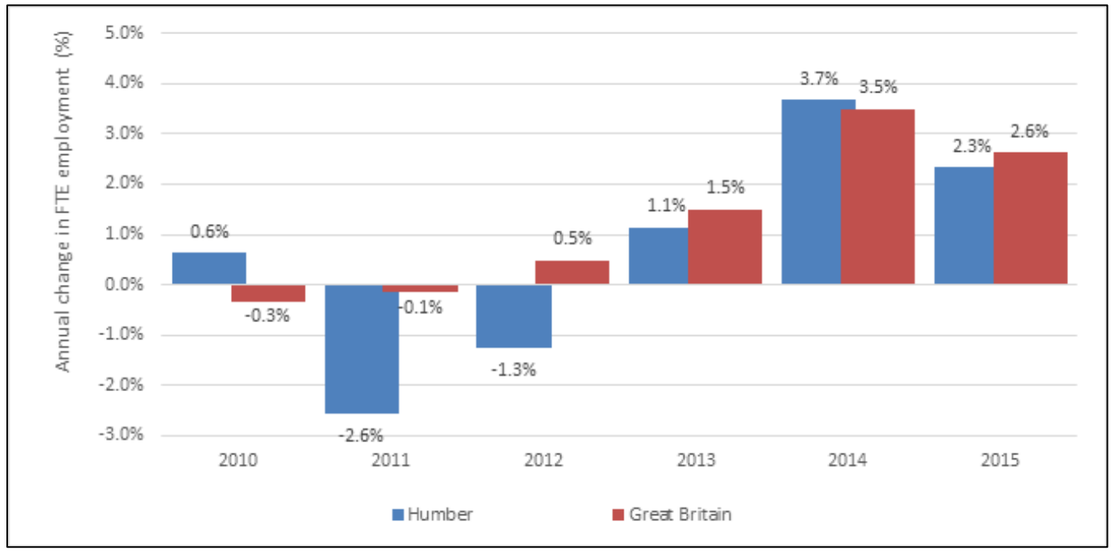
Table 10.25: Employment and employment density in Humber LEP, 2015.

Area	Total Number of Employees (000s)	% of Employees in Humber	Employment Density (Jobs per 1,000 working age residents)	FTE Number of employees (000s)
East Riding of Yorkshire	118	32%	593	98
Kingston upon Hull, City of	118	32%	692	99
North East Lincolnshire	66	18%	677	56
North Lincolnshire	70	19%	669	60
Humber	**373**	**-**	**651**	**312**
Great Britain	**28,531**	**-**	**712**	**24,125**

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

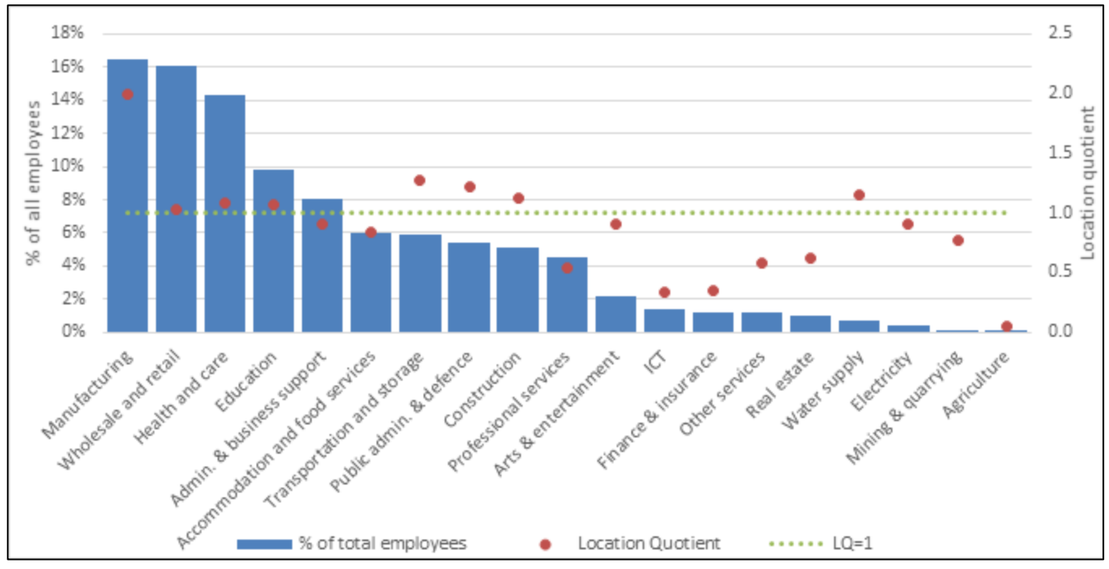
10.7.3.14 Annual changes in FTE employment are much more pronounced in the Humber compared to the national picture as shown in Figure 10.7. The Humber took longer to recover from the economic downturn, with positive growth in employment starting in 2013. Since then, the annual changes in FTE employment follow the national trend on the whole, with most recent growth rates of 2.3% in the Humber and 2.6% nationally.

[6] Please note: the analysis from BRES (2016) relates to the number of employees, as opposed to the total level of employment. In addition to employees, employment estimates include self-employed workers. In this instance, employee analysis is the most useful source of information as it allows for analysis on FTE basis and by sector.



Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c).

Figure 10.7: Employment trends (FTE), 2010-2015.



Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c).

Figure 10.8: Sectoral distribution of employment, Humber LEP 2015.

10.7.3.15 Analysis of employment by sector highlights the importance of manufacturing across the Humber: it is the largest sector in the area, accounting for 16% of employment (see Figure 10.8). LQ analysis shows the manufacturing sector in the Humber is twice more concentrated than nationally, reflecting the specialisation of the area. This is driven by the presence of large chemical manufacturers, British Steel and petrochemicals. Aside from manufacturing, however, employment in the Humber is concentrated in low value sectors, with wholesale and retail, health and education together accounting for 40% of the employment base.

Earnings and wealth generation

10.7.3.16 Data on median annual earnings for full-time employees shows Humber's residents earn £2,400 less on average than the national indicator. There is also a slight difference between resident and workplace earnings in the Humber: residents earn £300 more on average than those who work in Humber. This implies that residents commute to work outside of Humber, driving up resident wages. [7]

10.7.3.17 The difference between resident and workplace earnings is more pronounced within the local authorities. North Lincolnshire shows the highest wages out of the local authorities in Humber: workplace earnings of £28,400 exceed average earnings for the UK with resident wages the highest in the area (£27,500), although still lower than that across the UK.

[7] Residence-based earnings provide data for employees who are living in the area; workplace earnings provide earnings for employees who are working in the area.

Table 10.26: Resident and workplace median earnings for full-time employees (gross annual), Humber LEP 2016.

Area	Residence based earnings (£)	Workplace based earnings (£)
East Riding of Yorkshire	27,000	24,600
Kingston upon Hull, City of	23,600	25,700
North East Lincolnshire	26,400	24,800
North Lincolnshire	27,500	28,400
Humber	**25,800**	**25,500**
United Kingdom	**28,200**	**28,200**

Source: ONS, Annual Survey of Hours and Earnings 2016 (ONS, 2016d)

10.7.3.18 The Humber LEP contributed almost £18 billion GVA to the UK economy in 2015 as shown in Table 10.27. A more detailed geographical breakdown is available by NUTS3 area:

- North and North East Lincolnshire together account for 38% of Humber's GVA; and
- The East Riding of Yorkshire accounted for the largest share of Humber's GVA out of the single local authorities (34%), followed by Kingston upon Hull.

10.7.3.19 The GVA per head of population shows a significant gap between Humber and the UK, with GVA per head 25% below the national average (approximately £19,240 compared to £25,600). This is likely due to the area having a larger share of residents employed in low skill occupations compared to the UK, and given the sectoral composition of the employment in low value sectors. The earnings paint a similar picture, where Humber is below the rest of the UK in earnings and therefore, wealth generation.

Table 10.27: GVA and GVA per head, Humber LEP 2015.

Area	Total GVA (£millions)	GVA per head
Kingston upon Hull, City of	5,129	19,803
East Riding of Yorkshire	5,990	17,790
North and North East Lincolnshire	6,683	20,288
Humber	**17,802**	**19,243**
United Kingdom	**1,666,342**	**25,601**

Source: ONS, Sub-regional GVA 2015 (ONS, 2016e).

Humber supply chain capacity and capability

10.7.3.20 The Humber Local Impact Area has been able to benefit from several offshore wind developments in recent years, building on its existing industry strengths and further capabilities. There are a number of major businesses established in the Humber that are involved in offshore wind developments. These include Siemens and its blade manufacturing facility in Hull; REDS Maritime providing cable remediation and support services; GEV Wind Power – a turbine maintenance company, and other key energy players such as Centrica, Total and BP (Renewable UK, 2016b).

10.7.3.21 There are a number of investment plans underway, as companies based in Humber are aiming to capitalise on the offshore opportunities. These include the £160 million investment by Siemens in the Greenport Hull Facility as part of the £310 million combined investment from Siemens and ABP.

10.7.3.22 DONG Energy has an established presence in Humber LEP. Its operational offshore wind hub in Grimsby was established to support Westermost Rough, Race Bank and Hornsea Project One offshore wind farms.

Key supply chain sectors in Humber

10.7.3.23 Given the history of offshore wind supply chains in the Humber and the prominence of the manufacturing sector, there may be opportunities for businesses across several sectors to benefit from the construction and O&M activities from Hornsea Three.

10.7.3.24 Several sectors have the potential to be impacted by construction and O&M including construction and engineering sectors (see Table 10.28). It is likely that a share of this employment is already engaged in offshore wind supply chain activities given the presence of major industry players.

Table 10.28: Employment in key strategic sectors in Great Britain and Humber LEP, 2015.

Sector	Great Britain Employment (000s)	GREAT BRITAIN % of Total	Humber Employment (000s)	% of total in Humber	Humber LQ
Manufacturing	1,406	5%	43	11%	2.3
Construction	1,295	5%	19	5%	1.1
Land based transport	994	3%	19	5%	1.5
Engineering	940	3%	19	5%	1.5
Energy Generation	297	1%	5	1%	1.2
Marine Transport	14	0%	0.4	0%	2.0

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000.

10.7.3.25 A more detailed breakdown in sectors with supply chain opportunities is provided in Table 10.29. There are several specialisms within the Humber LEP's employment base which position the area well to benefit from Hornsea Three. The area shows specialisms within several manufacturing subsectors, including fabricated metal production and manufacturing of wires and devices, both of which have a LQ value of 1.3.

10.7.3.26 The transportation sector shows most local specialism, with FTE employment concentrations more than double that of Great Britain. This activity, especially sea and coastal transport, is driven by the presence of ports in the area. The transport sector also accounts for a large number of absolute jobs equivalent to 13,000 FTE employees.

Table 10.29: Employment in sectors with supply chain opportunities for construction and operation and maintenance, Humber 2015.

Sector	Great Britain FTEs (000s)	Humber FTEs (000s)	Humber LQ vs Great Britain
Manufacturing:			
Fabricated metal products	49	0.8	1.3
Motors, generators, transformers etc.	30	0.1	0.4
Wiring and wiring devices	15	0.3	1.3
General purpose machinery	54	0.3	0.4
Construction sectors:			
Building of ships and boats	32	0.1	0.1
Other civil engineering projects	107	1.3	0.9
Transport sectors:			
Freight transport by road	215	6.3	2.2
Sea and coastal freight water transport	6	0.2	2.4
Support activities for transportation	224	5.8	2.0
Professional services:			
Management consultancies	411	1.9	0.4
Architectural, engineering consultancy	427	3.8	0.7
Other professional, scientific and technical	84	0.6	0.6
Accommodation and food services:			
Accommodation	340	2.9	0.7
Food and beverage services	1130	12.5	0.9
Other sectors:			
Electric generation, transmission, distribution	77	1.0	1.1
TOTAL	**3202**	**38**	N/A

Source: ONS, Business Register and Employment Survey 2015 (ONS, 2016c). Numbers are rounded to nearest 1,000.

10.7.4 Data limitations

10.7.4.1 The most up to date information available has been used in the preparation of the baseline; however, there is often a lag in publishing national datasets so some information may be slightly out of date. These data limitations will not have a material effect on the predictability of the impact assessment.

10.7.4.2 Since January 2013, the number of people claiming Job Seeker's Allowance and Universal Credit have been combined. The new dataset combining Universal Credit and Job Seeker's Allowance means it is no longer possible to get an accurate indication of the number of people seeking work in occupations related to construction and O&M phases of offshore wind farm development. This has implications for the level of quantitative analysis which we are able to undertake in the baseline section and subsequently the assessment.

10.8 Key parameters for assessment

10.8.1 Maximum design scenario

10.8.1.1 The maximum design scenarios identified in Table 10.30 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the details provided in the project description (volume 1, chapter 3: Project Description). Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the Hornsea Three Design Envelope (e.g. different turbine layout), to that assessed here be taken forward in the final design scheme.

10.8.1.2 Hornsea Three has potential to affect socio-economic conditions in each of the three main phases of its lifecycle, namely:

- Construction (including project development, manufacture of components, assembly and commissioning);
- Operation and Maintenance; and
- Decommissioning.

10.8.1.3 The quantitative assessment will focus on the first two of these three phases. Given the level of uncertainty associated with the repowering / decommissioning phase of Hornsea Three (e.g. in relation to the approach or technologies utilised and associated costs) and the amount of time that will elapse before this phase takes place, there is insufficient information on which to base a quantitative assessment. However, comment will be provided on the broad types and potential scale of these socio-economic effects.

10.8.1.4 The assessment will consider the effects associated with both onshore and offshore infrastructure. For offshore infrastructure (e.g. the turbines), the assessment will consider onshore and offshore receptors. For instance, in relation to tourism activity the assessment considers effects on both onshore and offshore recreational activities. The assessment of effects associated with onshore infrastructure will be limited to onshore receptors. It is important to note that while the assessment draws on the evidence from other chapters (namely chapter 4: Landscape and Visual Resources, chapter 8: noise and vibration, chapter 6: Land Use and Recreation, and volume 2, chapter 10: Seascape and Visual Resources), there is not an overlap in the receptors used and the assessment of the impacts upon these. The socio-economic chapter is measuring the impact of Hornsea Three on visitor behaviour which is not assessed in the other chapters. For example, while the Landscape and visual resources chapter may conclude that there will be significant visual impacts from the construction of Hornsea Three, it does not quantify how these impacts may affect the volume and value of tourism.

10.8.1.5 The assessment of receptors will focus on socio-economic impacts where the link between Hornsea Three and the potential effect will be most clear. While there may be scope for effects on health and deprivation indices and a range of wider community measures, these can be affected by many factors. As a result, it would not be possible to adequately and robustly isolate the potential effect that Hornsea Three might have on these indicators, given that effects would arise indirectly in most cases.

10.8.1.6 The main economic and labour market receptors will be assessed in the final Environmental Statement to be submitted with the DCO application. The effects on tourism and recreation receptors are presented in this PEIR. The relevant receptors and impact areas are highlighted in Table 10.30.

Table 10.30: Maximum design scenario considered for the assessment of potential impacts on socio-economics.

Potential impact	Maximum design scenario	Justification
Construction phase		
The construction of Hornsea Three may have an impact on employment in construction in the supply chain: UK and Local Impact Areas.	Maximum design scenario does not apply for employment and GVA related impacts.	Effects in relation to employment and GVA generated as a result of construction activity are all beneficial, so there is no maximum adverse scenario. Detailed aspects of scheme design do not have a substantial bearing on the economic impact assessment. Non-design factors (such as the selection of ports, procurement approach and the geography of the development's supply chain) are much more important factors in determining the overall level of potential economic impact. Three construction scenarios will be assessed. The low impact scenario could be thought of as a maximum adverse insofar as the local and UK based benefits are at their lowest.
The construction of Hornsea Three may have an impact on the amount of GVA supported by construction activity: UK and Local Impact Areas.		
The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents: LEP level Impact Areas		
The construction of Hornsea Three may have an impact on the demand for housing, accommodation and local services: Local Impact Areas.	Maximum design scenario does not apply	Impacts on this receptor are driven by the geography of the development's labour force and the extent to which workers come from outside of the local impact area. This is not affected by detailed aspects of the scheme design. The maximum adverse scenario for this receptor would arise if all employment generated during the construction phase is filled by people from outside of the Local Impact Area. This is very unlikely to occur but represents a cautious position.
The construction of Hornsea Three may have an impact on the performance of the renewable energy sector : Local Impact Areas.	Maximum design scenario does not apply	Effects in relation to the impacts on the performance of the renewable energy sector are beneficial and not influenced by detailed aspects of scheme design.
The construction of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: Tourism Impact Area.	Reflects maximum design scenarios in related chapters.	The assessment of effects related to tourism and recreation draws on the assessments provided in related chapters including chapter 4: Landscape and Visual Resources, chapter 6: Land Use, and Recreation, chapter 8: Noise and Vibration, and volume 2, chapter 10: Seascape and Visual Resources. As a result the assessment will need to reflect the maximum adverse scenarios in these chapters.
The construction of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW: Tourism Impact Area	Reflects maximum design scenarios in related chapters.	
Operation phase		
The O&M of Hornsea Three may have an impact on employment in O&M and in the supply chain: UK and Local Impact Areas.	Maximum design scenario does not apply for employment and GVA related impacts.	Effects in relation to employment and GVA generated as a result of operation activity are all beneficial, so there is no maximum adverse scenario. Detailed aspects of scheme design will not have a substantial bearing on the economic impact assessment. Non-design factors (such as the selection of ports, procurement approach and the geography of the O&M supply chain) are much more important factors in determining the overall level of potential economic impact.
The O&M of Hornsea Three may have an impact on the amount of GVA (£m) supported by O&M activity: UK and Local Impact Areas.		
The O&M of Hornsea Three may have an impact on access to O&M related employment amongst local residents: Local Impact Areas.		
The O&M of Hornsea Three may have an impact on demand for housing, accommodation and local services: Local Impact Areas.	Maximum design scenario does not apply	Impacts on this receptor are driven by the geography of the development's labour force and the extent to which workers come from outside of the local impact area. This is not affected by detailed aspects of the scheme design. The maximum adverse scenario for this receptor would arise if all employment generated during the operation and maintenance phase is filled by people from outside of the Local Impact Area. This is very unlikely to occur but represents a cautious position.
The O&M of Hornsea Three may have an impact on the performance of the renewable energy sector: Local Impact Areas.	Maximum design scenario does not apply	Effects in relation to the impacts on the performance of the renewable energy sector are beneficial and not influenced by detailed aspects of scheme design.
The O&M of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: Tourism Impact Area.	Reflects maximum design scenarios in related chapters.	The assessment of effects related to tourism and recreation draws primarily on the assessments provided in other chapters (notably chapter 4: Landscape and Visual Resources,

Potential impact	Maximum design scenario	Justification
The O&M of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW: Tourism impact Area.	Reflects maximum design scenarios in related chapters.	chapter 6: Land Use, and Recreation, chapter 8: Noise and Vibration, and volume 2, chapter 10: Seascape and Visual Resources). As a result, the assessment reflects the maximum adverse scenarios of these chapters.
Decommissioning phase		
The decommissioning of Hornsea Three may have an impact on decommissioning related employment: UK and Local Impact Areas.	Maximum design scenario does not apply for employment and GVA related impacts.	Effects in relation to employment and GVA generated as a result of decommissioning activity are all beneficial, so there is no maximum adverse scenario. Detailed aspects of scheme design will not have a substantial bearing on the economic impact assessment. Non-design factors (such as the selection of ports, procurement approach and the geography of the decommissioning supply chain) are much more important factors in determining the overall level of potential economic impact.
The decommissioning of Hornsea Three may have an impact on the amount of GVA (£m) supported during decommissioning activity: UK and Local Impact Areas.		
The decommissioning of Hornsea Three may have an impact on access to decommissioning related employment amongst local residents: Local Impact Areas.		
The decommissioning of Hornsea Three may have an impact on demand for housing, accommodation and local services: Local Impact Areas.	Maximum design scenario does not apply	Impacts on this receptor are driven by the geography of the development's labour force and the extent to which workers come from outside of the local impact area. This is not affected by detailed aspects of the scheme design. The maximum adverse scenario for this receptor would arise if all employment generated during the decommissioning phase is filled by people from outside of the Local Impact Area. This is very unlikely to occur but represents a cautious position.
The decommissioning of Hornsea Three may have an impact on the performance of the renewable energy sector: Local Impact Areas.	Maximum design scenario does not apply	Effects in relation to the impacts on the performance of the renewable energy sector are beneficial and not influenced by detailed aspects of scheme design.
The decommissioning of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: Tourism Impact Area	Reflects maximum design scenarios in related chapters.	The assessment of effects related to tourism and recreation draws primarily on the assessments provided in other chapters (notably chapter 4: Landscape and Visual Resources, chapter 6: Land Use, and Recreation, chapter 8: Noise and Vibration, and volume 2, chapter 10: Seascape and Visual Resources). As a result, the assessment reflects the maximum design scenarios of these chapters.
The decommissioning of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW: Tourism impact Area.	Reflects maximum design scenarios in related chapters.	

10.9 Impact assessment criteria

10.9.1.1 The criteria for determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts. This section describes the criteria applied in this chapter to assign values to the sensitivity of receptors and the magnitude of potential impacts. The terms used to define sensitivity and magnitude are based on those used in the DMRB methodology, which is described in further detail in volume 1, chapter 5: Environmental Impact Assessment Methodology.

10.9.1.2 The absolute scale of economic impacts (i.e. the number of jobs which construction, O&M and decommissioning activity is expected to support under each scenario) will be calculated using an approach consistent with methods for economic impact assessment set out in HM Treasury Green Book (2003). The key assumptions underpinning the methodology are outlined in paragraphs 0 to 10.9.1.41. The socio-economic impact magnitude will then be determined by consideration of the predicted deviation from baseline conditions.

10.9.1.3 The criteria for defining sensitivity in this chapter are outlined in Table 10.31.

Table 10.31: Definition of terms relating to the sensitivity of the receptor.

Sensitivity	Definition used in this chapter
Very High	The receptor is identified as the highest ranking policy priority (as a result of economic potential and/or need). There is evidence of severe socioeconomic challenges, underperformance and vulnerability for the receptor in the impact area.
High	The receptor is identified as a policy priority (as a result of economic potential and/or need). There is evidence of major socioeconomic challenges or underperformance and vulnerability for the receptor in the impact area.
Medium	The receptor is not identified as a policy priority (as a result of economic potential and/or need). There is evidence of considerable socioeconomic challenges or underperformance and vulnerability for the receptor in the impact area.
Low (or lower)	The receptor is not identified as a policy priority (as a result of economic potential and/or need). There is evidence that the receptor is resilient and no particular weaknesses or challenges for the receptor in the impact area.
Negligible	The receptor is not identified as a policy priority (as a result of economic potential and/or need). There is evidence of good overall performance and no particular weaknesses or challenges for the receptor in the impact area.

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10.9.1.4

10.9.1.5 Table 10.32 . Professional judgement has been used in determining the magnitude of impacts at different spatial scales.

Table 10.32: Definition of terms relating to the magnitude of an impact.

Magnitude of impact	Definition used in this chapter
Major	Large change to baseline conditions in terms of absolute and/or percentage change
Moderate	Moderate change in baseline conditions which is noticeable in terms of absolute and/or percentage change
Minor	Minor shift away from baseline which would be noticeable in terms of absolute and/or percentage change in baseline conditions
Negligible	Very slight change from baseline condition
No change	No change from baseline condition.

10.9.1.6 The assessment of the magnitude of impacts will be underpinned by an analysis of the potential economic impacts supported by the construction and O&M of Hornsea Three. The magnitude of impact on most receptors considered in this chapter is primarily driven by the increased level of economic activity in the area as a result of construction and O&M expenditure and related supply chain activity, given the location of Hornsea Three and the expected geography of its supply chain.

10.9.1.7 For each of the three phases, construction, O&M and decommissioning, Hornsea Three has potential to affect economic conditions through three main economic effects; direct, indirect and induced economic effects. The approach to determining the scale of each of these effects will be outlined for each of the development scenarios when these have been finalised.

10.9.1.8 The impacts on employment and GVA expressed in annual terms will provide the most appropriate basis for assessing the magnitude of impact on baseline conditions. The magnitude of impact on employment and GVA receptors will therefore be provided in person years of employment and cumulative GVA, as well as in annual FTE jobs and annual GVA. The average annual impacts can be compared directly with the current employment and GVA levels in the UK and the Local Impact Areas.

10.9.1.9 The assessment of the magnitude of impact on the GVA receptor will be measured as a change against baseline conditions against the total level of GVA in the UK and Local Impact Areas.

10.9.1.10 The magnitude of impact on the employment receptor will be measured in two parts:

- The magnitude of impact associated with direct employment is assessed in the context of the current level of employment in relevant sectors. During construction, the relevant sectors include manufacturing and engineering. construction, land and marine transport, professional services, and accommodation and food services. During operation and maintenance, the relevant sector is electricity generation; and
- For indirect employment effects, the magnitude of impact will be determined in the context of the current level of employment in the whole economy (as these impacts will occur in a much wider spread of sectors).

10.9.1.11 The significance of the effect upon socio-economics will be determined by correlating the magnitude of the impact and the sensitivity of the receptor. The particular method employed for this assessment is presented in Table 10.33. Where a range of significance of effect is presented in Table 10.33, the final assessment for each effect will be based upon expert judgement.

10.9.1.12 For the purposes of this assessment, any effects with a significance level of minor or less will be concluded to be not significant in terms of the EIA Regulations.

Table 10.33: Matrix used for the assessment of the significance of the effect.

		Magnitude of impact				
Sensitivity of receptor		***No change***	***Negligible***	***Minor***	***Moderate***	***Major***
	Negligible	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible	Negligible or minor	Minor	Moderate	Moderate or major
	High	Negligible	Minor	Minor or moderate	Moderate or major	Major or substantial
	Very high	Negligible	Minor	Moderate or major	Major or substantial	Substantial

Direct economic impacts

10.9.1.13 Direct impacts measure the economic effects that are wholly related to the construction and O&M of Hornsea Three.

10.9.1.14 For the construction phase, the direct effects capture the jobs created and GVA associated with the first round of capital expenditure on the construction of the wind farm i.e. that which the Applicant will spend directly with its suppliers. Based on the sourcing assumptions which will be developed for each of the development scenarios, benchmark figures (from the Annual Business Survey 2015) will be applied to the additional output generated in each sector to estimate the number of jobs, and associated GVA that would be created in each impact area as a result of the estimated direct spend.

10.9.1.15 For the O&M phase, the direct effects will capture the jobs and associated wealth creation that are directly associated with O&M activity i.e. employees engaged in activities relating to the management, O&M, monitoring and maintenance of Hornsea Three. The number of direct jobs in each impact area and the direct GVA associated with these positions will be estimated based on the sourcing assumptions which will be developed for each scenario.

Indirect economic impacts

10.9.1.16 Indirect impacts will capture the FTE jobs and GVA generated in the Local Impact Area in the chain of suppliers of goods and services to the direct activities.

10.9.1.17 For the construction phase, the indirect impacts will be derived from the expenditure on goods and services that accompanies directly supplying Hornsea Three would spend in their own supply chains. This will be estimated using an economic model using the UK Input-Output tables (ONS, 2005). The model estimates the amount of output that is generated across various sectors as a result of input into (or spend in) a particular sector of the economy.

10.9.1.18 The UK input output tables (ONS, 2005) will be used to model the way in which the direct expenditure with first tier construction suppliers would lead to indirect employment and GVA effects further down the supply chain by converting the indirect output in each sector into employment and GVA using benchmark data provided by the Annual Business Survey (as for the calculations of direct impacts).

10.9.1.19 For the O&M phase, the indirect effects will capture the jobs and GVA associated with all supply chain expenditure required during the O&M phase.

Induced economic impacts

10.9.1.20 As a result of both the direct and indirect impacts, there will be additional employment and wealth which arise through the expenditure of personal income by those whose jobs are supported directly or indirectly. These induced economic impacts will be spread across the UK, regional and local economies, arising in production, manufacturing, construction and traded and non-traded service sectors.

10.9.1.21 Compared to the direct and indirect economic impacts, there is typically greater uncertainty about the scale, sectoral distribution and geographical spread of these impacts. This uncertainty is one of the reasons why induced economic multipliers for sectors are not published by the ONS.

10.9.1.22 In line with the Applicant's desire to adopt a cautious approach to the socio-economic impact assessment, the induced economic effects will not be quantitatively assessed here. However, it should be noted that these impacts are a beneficial consequence of the proposed investment.

Wider economic impacts

10.9.1.23 The assessment of economic impacts arising through Hornsea Three will also encompass a number of considerations:

- The extent to which local residents are able to access the job opportunities which arise locally, through the direct and indirect effects during the construction, O&M and decommissioning phases;
- The impact on the performance of business sectors, particularly those which could have a major role as part of the supply chain during construction, O&M and decommissioning for example the renewable energy sector, construction, engineering and marine transport sectors; and
- Any potential impacts on the volume and value of tourism activity.

10.9.1.24 In line with official guidance (HM Treasury's (2003) The Green Book), the temporary job creation arising during the construction period will be assessed and presented in terms of full-time equivalent (FTE) person years of employment. Average annual FTE impacts during the construction phase will also be estimated to allow the magnitude of potential change in baseline levels of employment to be captured. Similarly, cumulative GVA impacts will be presented for the construction phase together with the average annual increases.

10.9.1.25 Job creation arising through the O&M activity will be presented as FTE jobs and indirect supply chain GVA effects will be presented as annual impacts.

Impact scenarios

10.9.1.26 The assessment of potential socio-economic effects is subject to various sources of uncertainty. In particular:

- The location of the main tier one (ie those contracted directly to the Applicant) and tier two suppliers (ie those contracted to tier 1 suppliers) and their associated supply chains and the extent to which this influences the retention of supply chain expenditure in the impact areas;
- The likelihood of ports in the impact areas being selected as construction and O&M bases and the range of functions they might serve; and
- The potential for the range and expertise of suppliers and workers to be increased or enhanced prior to the procurement of the project.

10.9.1.27 These sources of uncertainty are interlinked and influenced by a range of factors, some of which are related directly to Hornsea Three and others (such as procurement regulations and wider economic conditions) are not. In light of these uncertainties, it is difficult to provide a definitive assessment of the likely geography of Hornsea Three's supply chain.

10.9.1.28 Various studies of offshore wind farm supply chains have highlighted the variation in the amount of goods and services that are procured locally and nationally during construction and O&M. The most recent analysis of UK content that is currently in the public domain was published by Renewable UK (undertaken by BVG Associates) in November 2015. The study collected data from 10 offshore wind farms built between 2009 and 2013, assessing the development, construction and manufacture, operation and maintenance stages, and their total expenditure. The UK content for these projects averaged 43% overall, with the highest achieved content of 57% (see Table 10.34).

Table 10.34: UK Content of offshore wind farm total expenditure.

	UK content		
Cost category	Lower	Upper	Weighted average
Development expenditure	16%	90%	57%
Capital expenditure	12%	32%	18%
O&M	64%	82%	73%
Total expenditure	**30%**	**57%**	**43%**

Source: BVG Associates (2015).

10.9.1.29 The BVG Associates (2015) study is currently being updated to provide more recent evidence on the level of UK content offshore wind farms have been able to achieve in recent years. The update of the work is expected to reflect the increased involvement of UK suppliers in the offshore wind supply chain. Regeneris Consulting Limited is currently working with DONG Energy to reflect their insight into the sector, and will aim to use the most up-to-date assumptions in the assessment of impacts that will be carried out and submitted with the final DCO application. The BVG Associates (2015) study is currently being updated to provide more recent evidence on the level of UK content offshore wind farms have been able to achieve in recent years. The update of the work is expected to reflect the increased involvement of UK suppliers in the offshore wind supply chain. Regeneris Consulting Limited is currently working with DONG Energy to reflect their insight into the sector, and will aim to use the most up-to-date assumptions in the assessment of impacts that will be carried out and submitted with the final DCO application.

10.9.1.30 It is important to note that even with making use of the most-up-to-date assumptions, it will be difficult to confidently predict the likely geography of Hornsea Three's supply chain as this will depend on both the approach of the Applicant, and the level of relevant capability and capacity that exists in local impact areas and across the UK. Given the complexity which will inevitably arise as a result of the interlinked factors which influence local economic outcomes, and bearing in mind the need to be transparent about the sources of uncertainty in the assessment, a scenario based approach will be taken to illustrate the potential range of impacts which might be captured in the UK and each of the Hornsea Three Local Impact Areas.

10.9.1.31 This approach is in line with current policy and best practice in both the scope (MMO, 2011 and Renewable UK, 2011) and assessment method (Defra, 2010). This scenario analysis will be developed to assess the socio-economic effects of the potential activities that could take place at ports within the Local Impact Areas. While the scenarios will not cover all potential socio-economic outcomes, they will provide illustrative assessments of the potential low, medium and high socio-economic impact scenarios for the Local and UK Impact Areas.

10.9.1.32 The sourcing assumptions for each scenario will be informed by:

- A review of published research examining the nature of both the onshore and offshore wind farm supply chains in the UK, selected regions and the local impact areas, as well as the latest evidence on the level of UK content which is being achieved;
- A review of published ex-post studies examining the economic impact of offshore wind farms in the UK;
- An analysis of the economic sectors in the Hornsea Three Local Impact Areas which has focused on identifying the sectors in which the Local Impact Areas has particular strengths; and
- Ongoing discussions with the Applicant concerning the procurement process and likelihood that UK suppliers might capture part of the supply chains.

10.9.1.33 A recent paper on the Strategic Review of East Coast Staging and Construction Facilities (BVG Associates, 2016) has been drawn on so far to determine the likely capacity and capability of the ports in New Anglia and Humber Local Impact Areas. The report suggests that within the New Anglia Local Impact Area, Great Yarmouth is the only port which has an appropriate level of capability to be used as part of the construction phase. In Humber LEP, there are numerous ports which offer appropriate capability and which might be considered during the construction phase of the development. These might are include Alexandra Dock. Albert Dock, Killingholme and Immingham.

10.9.1.34 The impact scenarios will aim to reflect the capacity and capability assessment of ports in New Anglia and Humber. As a result, a low, medium and high scenarios will be developed for Humber LEP, and a low and medium scenario for New Anglia LEP.

10.9.1.35 It is important to note that there is potential for ports in each of the impact areas to play a role in the construction and operation of Hornsea Project Three. For the construction phase at least, it is feasible that ports in both Humber LEP and New Anglia LEP could be used.

10.9.1.36 The high O&M scenarios for Humber LEP and New Anglia LEP are mutually exclusive, as it will be assumed that one Local Impact Area is benefitting from a substantial share of supply chain activities, and therefore could only occur in one of the Local Impact Areas. We emphasise, however, that the outline scenarios show a range of potential impacts which could feasibly arise. The scenarios may include a combination of ports in both Local Impact Areas being used to supply different activities. For this reason, high and low scenarios will be developed for operation and maintenance phase to emphasise this range, and the potential combination of impacts in both Humber and New Anglia Local Impact Areas.

10.9.1.37 The assessment will illustrate the scale of impacts which could occur in the Local Impact Areas, without concluding which impacts would occur in which areas. The outline scenarios are summarised in Table 10.35.

Table 10.35: Hornsea Three Scenario Design and Key Assumptions..

Scenario	UK	Local Impact Area: Humber LEP	Local Impact Area: New Anglia LEP
Low Impact Construction Scenario	***No UK Ports Used*** Main construction ports outside of the UK and turbine and associated supply chain all overseas. Very limited supply chain opportunities for UK firms. Modest amount of UK based sourcing for balance of plant activities (largely cables, substation components and turbine foundations).	***No Humber Ports Used*** Minimal local involvement in elements of the UK based construction supply chain.	***No New Anglia Ports Used*** Minimal local involvement in elements of the UK based construction supply chain.
Medium Construction Scenario	**UK Ports Used for Laydown** Some use of UK ports for laydown for some components. Turbine and tower manufacture remains outside of UK so port use is still modest.	**Some use of Humber Ports for Laydown** Concentration of activity in vicinity of the port leading to greater involvement of local suppliers in installation and commissioning activities. Some use of local vessels.	**Some use of East Anglia Ports for Laydown** Concentration of activity in vicinity of the port leading to greater involvement of local suppliers in installation and commissioning activities. Some use of local vessels.

Scenario	UK	Local Impact Area: Humber LEP	Local Impact Area: New Anglia LEP
High Impact Construction Scenario	**UK Ports Used and Major Components Sourced from UK** More extensive port use linked to greater sourcing of components from within UK. UK involvement in turbine and tower manufacture and associated supply chain impact drives greater level of impact.	**Extensive Use of Humber Ports** Ports in Humberside used extensively. Turbine blades sourced from within the Humber Local Impact Area, leading to associated supply chain impacts. Greater involvement of local suppliers in installation and commissioning. Some use of local vessels.	**Not applicable due to lower likelihood of supplying turbine components.** As the high scenario for Humber assumes sourcing of blades from the Siemens manufacturing facility (enabling Humber to capture a larger share of investment), the high scenario will not be used for New Anglia. Please note that this does not mean that New Anglia cannot benefit from construction of Hornsea Three, rather, the high scenario reflects the larger share of construction costs Humber could capture due to its port and supply chain capabilities.
Low Impact O&M Scenario	**No UK Based O&M base** Hornsea Three operated and maintained from overseas base and associated economic impact in the UK is minimal as a result.	**No Humber Based O&M Base** Activity limited to those associated with onshore cable route and local activities to service and maintain onshore sub-stations. None/very few O&M technicians for offshore infrastructure from within the LIA Very minimal local supply chain involvement.	**No New Anglia Based O&M Base** Activity limited to those associated with onshore cable route and local activities to service and maintain onshore sub-stations. None/very few O&M technicians for offshore infrastructure from within the LIA Very minimal local supply chain involvement.
High Impact O&M Scenario	**UK Based O&M Base** O&M of Hornsea Three takes place from a UK base Associated supply chain is predominantly UK based (in areas where capacity exists) Technicians and other employees predominantly UK based.	**O&M Base in Humberside** All of the operations services from a base in Humberside Significant local supply chain involvement Higher level of technicians from within local impact area employed.	**O&M Base in New Anglia** All of the operations services from a base in New Anglia Significant local supply chain involvement Higher level of technicians from within local impact area employed.

10.9.1.38 Note: High scenario for Humber and New Anglia are mutually exclusive.DONG Energy is committed to develop and deepen UK's supply chain offer to offshore wind, and has been working collaboratively with other developers, suppliers and UK government to identify and realise supply chain opportunities in offshore wind for UK suppliers. On a national level, this includes working with the current supply chain to identify new opportunities to work with UK companies and encouraging inward investment by the global supply chain into new manufacturing facilities in the UK.

10.9.1.39 On a local level, direct engagement early on with the local supply chain can help to maximise potential opportunities. This includes encouraging top tier suppliers to utilise local suppliers; facilitating contact between local UK suppliers and top tier suppliers so they can form business relationships and hosting/participating in supply chain forums which give local suppliers the opportunities to understand our business plans and approach. For example, in March 2017, Hornsea Three participated in the East of England Energy Group (EEEGR) SNS 2017 conference to raise awareness of the project within local business networks. DONG Energy has also held a number of local supply chain events for its recent projects including for Burbo Extension in Liverpool in June 2015, for Walney Extension in Barrow in February 2016 and for Hornsea Project One in Grimsby in December 2016. It is expected that similar events would be held for Hornsea Three at the appropriate times.

10.9.1.40 Building relationships with capable, competitive and innovative suppliers is essential to delivering new projects successfully. Hornsea Three will work closely with the relevant LEPs and business networks and other relevant organisations in the Local Impact Areas to understand what can be supplied locally and maximise any opportunities.

10.9.1.41 The assessment will aim to reflect the latest developments in the offshore wind industry, and therefore remains ongoing at this stage. The following steps are being taken in order to complete the assessment:

- Exploring the latest evidence on UK content with DONG Energy; and
- Consultations with industry, national bodies and local stakeholders.

10.10 Assessment of significance

10.10.1 Measures adopted as part of Hornsea Three

10.10.1.1 As part of the project design process, a number of designed-in measures have been proposed to reduce the potential for impacts on socio-economics (see Table). This approach has been employed in order to demonstrate commitment to measures by including them in the design of Hornsea Three and have therefore been considered in the assessment presented in section 10.10 below. Assessment of sensitivity, magnitude and therefore significance includes implementation of these measures.

10.10.1.2 In the context of socio-economics, the adopted measures are focused on activities to maximise the socio-economic benefits associated with the construction, O&M and decommissioning phases of Hornsea Three, and to boost the amount of socio-economic benefit which is captured in the Local Impact Areas.

10.10.1.3 Designed-in measures for socio-economics will be further developed through consultation with the Humber LEP and/or New Anglia LEP in the coming months and will be reported in the Environmental Statement submitted with the application for development consent as required.

Table 10.36: Designed-in measures adopted as part of Hornsea Three.

Measures adopted as part of Hornsea Three	Justification
Identify opportunities for companies to access supply chain opportunities.	*Increase the level socio-economic benefit captured in the Local Impact Area.*
Identify opportunities for local people to access employment associated with Hornsea Three.	

10.10.1.4 Developing people with the right skills to deliver the UK's offshore wind ambitions is a key priority for DONG Energy. Hornsea Three will seek to maximise the amount of economic benefit that the development delivers in the Local Impact Areas considered.

10.10.1.5 Technological advances in the offshore wind industry are changing the nature of jobs associated with the offshore wind sector. Hornsea Three will work with local partners and seek to maximise the ability of local residents to access employment opportunities associated the construction and operation of the wind farm.

10.10.1.6 Current uncertainty about the scale of economic opportunity likely to arise locally means that specific actions cannot yet be identified or developed. However, Hornsea Three will work with the LEPs and wider stakeholders to identify skills and supply chain needs in the local area and maximise local economic benefit.

10.10.1.7 Should consent for Hornsea Three be granted, the Project would assess in partnership with the LEP, the need for additional actions to support local economic benefit. Effective communication between Hornsea Three and relevant stakeholders as local opportunities become clear will help local businesses and authorities to plan for the supply chain and skills demand associated with Hornsea Three.

10.10.1.8 Once the nature and scale of local economic opportunities are more clear, it will also be possible to properly assess whether there is a case for targeted actions to develop labour market capability. Hornsea Three will develop and deliver a Skills and Employment Plan.

10.10.2 Construction Phase

10.10.2.1 The impacts of the onshore and offshore construction of Hornsea Three will be assessed on the main economic and labour market receptors in the final Environmental Statement to be submitted with the DCO application. The PEIR provides an assessment on tourism and recreation receptors.

10.10.2.2 These socio-economic impacts arising from the construction of Hornsea Three will be listed in Table 10.30 along with the maximum design scenario against which each construction phase impact will be assessed.

10.10.2.3 The assessment will consider the following:

- Impacts of construction may affect employment in construction and the supply chain.
- Impacts of construction may have an impact on the amount of GVA supported by construction activity.
- The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents.
- The construction of Hornsea Three may have an impact on demand for housing, accommodation and local services in the Local Impact Areas.
- The construction of Hornsea Three may have an impact on the performance of the renewable energy sector.

10.10.2.4 A description of the potential effect on tourism and recreation receptors is given below.

The construction of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity, and associated economic value in the local impact area.

Tourism Impact Area

Magnitude of impact:

10.10.2.5 The construction phase could potentially result in a number of impacts on offshore and coastal tourism and recreation activity, and the associated economic value. This receptor is focused on onshore recreation and tourism resources as well as offshore recreation activities (eg water sports).

10.10.2.6 The potential effects on tourism and recreation could be created by the following impacts:

- Visual impacts associated with the construction and installation of onshore and offshore infrastructure;
- Noise and vibrations impacts associated with the construction and installation of the onshore and offshore infrastructure; and
- The disruptions to onshore and offshore recreational activities occurring as a result of construction activities (for example, cruising routes in and around the construction site).

10.10.2.7 Effects arising as a result of the impacts outlined above could include displacement of offshore and coastal tourism and recreation activity to areas which are not affected by these impacts during construction.

10.10.2.8 The visual impact of construction is assessed fully in chapter 4: Landscape and Visual Resources. The assessment concluded the following:

- Construction works nearshore and in the intertidal area are not expected to result in significant effects on landscape resources.
- Construction impact on the nearshore and intertidal areas on the national seascape, landscape and character areas is not expected to be significant.

- The construction of the onshore cable corridor to the south of the convergence of the western and eastern options would directly affect three local character areas (LCAs) in North Norfolk, with heavy plant and construction traffic to be evident in surrounding areas. The effects are expected to be significant in EIA terms. These effects would be localised and of short term duration.
- The impact of construction of the onshore HVAC booster station is not expected to have a significant impact on designated landscapes within local planning policy, nor on national landscape character areas.
- The construction of the onshore HVDA converter/HVAC substation is not expected to have a significant impact on designated landscapes and landscapes denoted in planning policy, nor on national landscape and character areas.

10.10.2.9 The impact on seascape and visual resources are assessed fully in volume 2, chapter 10: Seascape and Visual Resources. The main findings show that no significant effects are expected during construction:

- There are no significant adverse effects that are expected on the present day seascape character through the introduction of new or uncharacteristic features, nor any significant effects on the existing historic seascape character.
- The temporary change in the existing visual scenario is not expected to have a significant effect on visual receptors.

10.10.2.10 The noise and vibration impacts are assessed fully in volume 3 chapter 8: Noise and Vibration. The noise and vibration effects which are expected to be significant are:

- The temporary effects during cable installation, which may be significant if in close proximity to the receptor. The effects off the construction site are expected to be negligible.
- Temporary effect of cable installation by HDD on receptors sensitive to noise and vibration may be significant in EIA terms. The effects are also not expected to be significant beyond the immediate site.
- The temporary effect of construction of cable route accesses may be significant in EIA terms. Offshore vibrations are expected to be negligible from all locations.

10.10.2.11 While the evidence from the above assessments identified several potentially significant impacts, not all of these would be expected to affect tourism and recreation activities. There is no evidence that the presence of construction machinery would deter tourism, especially when this activity is confined to a small area. Likewise, the noise and vibrations caused by HDD would only be significant from a close distance.

10.10.2.12 The combination of factors and the fact that, based on this evidence, there would not be a negative impact on tourism and recreation as a result of noise impacts during the construction phase of Hornsea Three..

10.10.2.13 Overall, the impacts which are expected to have significant effects as a result of construction activity are temporary in nature. The impacts are expected to be limited to a small number of areas.

10.10.2.14 The baseline section had set out the evidence from literature on the impacts of offshore wind farms on tourism, which suggests limited negative impact on recreational users. The assessment therefore cannot conclude that construction of Hornsea Three will affect the volume and value of tourism in the Tourism Impact Area.

10.10.2.15 The impact on offshore and coastal tourism and associated economic value is expected to be **negligible**.

Sensitivity of receptor

10.10.2.16 Tourism is an important sector across the Tourism Impact Area, accounting for approximately 9% of the area's total employment. Tourism employment makes up a larger proportion of overall employment than it does nationally by one percentage point (i.e. employment in the sector is more concentrated in the Local Impact Area than nationally).

10.10.2.17 There is particularly a notable concentration of tourism employment within the district of North Norfolk, where tourism employment accounts for 16% of the total (twice the national average). The importance of the tourism sector in North Norfolk is reflected in the profile of, and priority attached to, the sector in local economic development policy.

10.10.2.18 The receptor is therefore deemed to be of high value, in light of this concentration that exists within the Tourism Impact Area, and particularly North Norfolk. The sensitivity of the receptor is therefore considered to be **high**.

Significance of the effect

10.10.2.19 In light of the limited magnitude of effects on recreational resources and visual receptors, the overall effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

The construction of Hornsea Three may have an impact on local tourism and recreational resources, including public rights of way.

Tourism Impact Area

Magnitude of impact:

10.10.2.20 The areas where there may potentially be disruption to local tourism and recreational resources (including PRoW) are limited to those where the onshore infrastructure (onshore cable and onshore HVDC converter/HVAC substation and onshore HVAC booster station) would be present.

10.10.2.21 The visual impact of the construction of onshore infrastructure on receptors using PRoW is assessed in chapter 4: Landscape and Visual Resources. The chapter concluded that:

- Some areas around the offshore cable corridor are likely to experience changes in visual receptors due to construction machinery being present, but the PRoW are likely to remain open.
- The construction of onshore HVAC booster station and HVDC converter/HVAC substation may result in some footpaths being diverted for the duration of construction works, however, there were no significant impacts identified.

10.10.2.22 The impacts of construction on PRoW are assessed fully in chapter 6: Land Use and Recreation. The assessment concluded that:

- The effect of construction on access to the coast is not expected to be significant.
- There is potential for the landfall construction works to cause temporary disruption to a section of the Peddars Way and Norfolk Coast Path National Trail running west from its junction with the England Coast Path in Weybourne during construction. The effect is assessed to significant if the construction activity will be taking place during peak months, but localised and temporary in nature.
- The construction of the onshore cable corridor may result in temporary disruption of recreational resources. The effects are expected to be significant, but the effects could be minimised if construction took place outside of the peak visitor times.
- The construction of onshore cable route may temporarily disrupt the National Cycle Route. The temporary effect is expected to be significant in EIA terms.

10.10.2.23 While there are some disruptions identified to PRoW, there is a limited number of these, and all are expected to be short term and temporary in nature. Given the localised nature of the impacts on the receptor, it is possible there may be a small level displacement of local tourism within the Tourism Impact Area if visitors choose to amend their routes during the visit. However, we do not expect the level of local tourism and recreational resources to be affected overall.

10.10.2.24 The effects are expected to be localised and of temporary duration. The magnitude is therefore considered to be **negligible**.

Sensitivity of receptor

10.10.2.25 The onshore tourism and recreation receptors, including PRoW make an important contribution to tourism in the local area. The sensitivity of the receptor is deemed to be **high**.

Significance of the effect

10.10.2.26 The effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

10.10.3 Operational and maintenance phase

10.10.3.1 The impacts of the onshore and offshore Operation and maintenance of Hornsea Three will be assessed on the main economic and labour market receptors in the Environmental Statement. The PEIR provides an assessment on tourism and recreation receptors.

10.10.3.2 The socio-economic impacts arising from the operation and maintenance of Hornsea Three will be listed in Table 10.30 along with the maximum design scenario against which each operation and maintenance phase impact has been assessed.

10.10.3.3 The assessment will consider the following:

- Impacts of operation and maintenance may affect employment in operation and maintenance and the supply chain.
- Impacts of operation and maintenance may have an impact on the amount of GVA supported by operation and maintenance activity.
- The operation and maintenance of Hornsea Three may have an impact on access to operation and maintenance-related employment amongst local residents.
- The operation and maintenance of Hornsea Three may have an impact on demand for housing, accommodation and local services in the Local Impact Areas.
- The operation and maintenance of Hornsea Three may have an impact on the performance of the renewable energy sector.

10.10.3.4 A description of the potential effect on tourism and recreation receptors is given below.

The operation and maintenance of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value in the local impact area.

Magnitude of impact

10.10.3.5 The O&M phase of Hornsea Three could potentially stimulate impacts on onshore coastal tourism and recreation activity and associated economic value. These effects are primarily related to the following:

- Visual impacts associated with the O&M activity;
- Noise and vibrations impacts associated with the O&M activity; and
- The disruptions to onshore and offshore recreational activities occurring as a result of O&M activities.

10.10.3.6 Effects arising as a result of the impacts outlined above could include displacement of offshore and coastal tourism and recreation activity to areas which are not affected by these impacts during construction.

10.10.3.7 Visual effects of offshore infrastructure are very limited from most onshore locations, given the distance of Hornsea Three from the shore. The visual impacts of Hornsea Three are assessed fully in chapter 10: Seascape and Visual Resource. The assessment notes that during O&M there may be some visual impact of maintenance activities (e.g. vessels and helicopters) and views of the offshore infrastructure. These are expected to be of negligible to minor adverse significance, which is not significant in EIA terms. Hornsea Three may be visible to sailors and people on board of vessels, which is also expected to not be significant. That assessment also notes that where offshore wind farms are visible, their presence can

10.10.3.8 Responses by people to wind farms can vary from 'beautiful' to 'offensive', with respondents perceiving wind turbines as potentially rhythmic, unusual, safe, interesting, invigorating, majestic and spiritual on the one hand and degrading, jarring, overbearing, industrial, clashing and ugly on the other. Wind energy development thus gives rise to a spectrum of responses from individuals and organisations who perceive its effects ranging from strongly adverse to strongly beneficial. It is possible that the presence of Hornsea Three could lead to some tourism benefits, with people being attracted to the area to learn more about the offshore wind industry.

10.10.3.9 The visual impacts of the onshore infrastructure during O&M phase is assessed fully in chapter 4: Landscape and Visual Resources. The assessment concluded that the effect of O&M activities associated with the onshore export cable route is expected to be minimal. The O&M of the onshore HVAC booster station and onshore HVDC converter/HVAC substation is expected to have a minor impact on designated landscape and national landscape is not expected to be significant.

10.10.3.10 The impact of wind farm on recreational resource during O&M is assessed fully in chapter 6: Land Use and Recreation. The assessment concluded that following the completion of the construction works, all areas of access land, recreational resources, PRoWs and other linear routes affected by the onshore works would be re-instated to their current condition and/or along their current alignments. There would be no physical effects on these resources arising from the operation or maintenance of Hornsea Three.

10.10.3.11 The effects on relevant receptors are therefore expected to be minimal.

10.10.3.12 The impact is predicted to be of a local spatial extent and short term duration. The impact is expected to be of **negligible** magnitude.

Sensitivity of receptor

10.10.3.13 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.10.2.5 to to 10.10.2.19).

10.10.3.14 The receptor is therefore considered to be of **high** sensitivity.

Significance of the effect

10.10.3.15 The effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

The operation and maintenance of Hornsea Three may have an impact on local tourism and recreational resources, including public rights of way.

Tourism Impact Area

Magnitude of impact

10.10.3.16 A full assessment of the effect of O&M of Hornsea Three on local tourism and recreational resources and PRoW is outlined in chapter 6: Land Use and Recreation. The assessment concluded that there would be no physical effects on these resources arising from the operation or maintenance of Hornsea Three.

10.10.3.17 Visual impacts associated with onshore infrastructure are outlined in chapter 4: Landscape and Visual Resources. The assessment concludes that the effect of O&M activities associated with the onshore cable route are expected to be minimal. The O&M of the onshore HVAC booster station is expected to have a minor impact on designated landscape and national landscape is not expected to be significant.

10.10.3.18 The visual impacts of the offshore infrastructure will be very limited onshore locations due to the large distance of Hornsea Three from the shore. The visual impacts are assessed in full detail in volume 2, chapter 10: Seascape and Visual Resources. The assessment concludes that no significant effects are expected as a result of O&M activities.

10.10.3.19 In light of these assessments, the magnitude of the impact of O&M on local tourism and recreational resources is expected to be **negligible**.

Sensitivity of receptor

10.10.3.20 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraph 10.10.2.25).

10.10.3.21 The receptor is therefore considered to be of **high** sensitivity.

Significance of the effect

10.10.3.22 The effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

10.10.4 Decommissioning phase

10.10.4.1 The impacts of the decommissioning of Hornsea Three will be assessed on the main economic and labour market receptors in the Environmental Statement. The PEIR provides an assessment on tourism and recreation receptors.

10.10.4.2 The socio-economic effects arising from the decommissioning of Hornsea Three will be listed in Table 10.30 along with the maximum design scenario against which each decommissioning phase impact has been assessed.

10.10.4.3 There is a lot of uncertainty concerning the potential effects of the decommissioning of the Hornsea Three development. This is because the approach to decommissioning, the available technology which could be used and the associated costs are not known at this stage.

10.10.4.4 The exact nature of the work required will depend on the planning requirements attached to Hornsea Three and is therefore likely to vary. However, at a minimum, this phase will involve taking down and disposing of the wind turbines. Disposal may either involve scrapping the turbines or selling them second hand. Both outcomes would require civil engineering expertise to dismantle the towers and transportation services to remove them from the site. This work is likely to be undertaken by UK based businesses and potentially businesses based within the Local Impact Areas, although it is very difficult to predict the level of local supply chain involvement at this stage.

10.10.4.5 The impact of the decommissioning phase of an offshore wind farm on a site in the UK has not yet been witnessed, although there are a limited number of overseas examples on which to draw. The assessment of the anticipated impacts will therefore be drawn from industry wide comparative evidence where this is available.

10.10.4.6 A description of the potential effect on tourism and recreation receptors is given below.

The decommissioning of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value.

Tourism Impact Area

Magnitude of Impact:

10.10.4.7 Impacts during the decommissioning phase are likely to be as for the construction phase. The effects would therefore be associated with the following types of impact:

- Visual impacts both offshore and onshore;
- Noise and vibration impacts; and
- Disruption to onshore and offshore recreational activities.

10.10.4.8 As with the construction and O&M phases, the effects arising during decommissioning as a result of these impacts may result in displacement of tourism activity.

10.10.4.9 Effects are therefore expected to be of **negligible** magnitude overall with minimal disruption on recreation activities.

Sensitivity of receptor

10.10.4.10 As for the construction and O&M phases, the sensitivity of the employment receptor, based on current policy context and socio-economic conditions is considered to be **high**.

Significance of effect

10.10.4.11 The effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

The decommissioning of Hornsea Three may have an impact on local tourism and recreational resources, including public rights of way.

Tourism Impact Area

Magnitude of impact:

10.10.4.12 Impacts during decommissioning phase are not likely to exceed the effects during construction and O&M phases. The expectation is that there may be some temporary and localised disruption to recreational resources and PRoW in the short term.

10.10.4.13 Overall, the effects are anticipated to be off **negligible** magnitude.

Sensitivity of receptor

10.10.4.14 As for the construction and O&M phases, the sensitivity of the employment receptor, based on current policy context and socio-economic conditions is considered to be **high**.

Significance of effect

10.10.4.15 The effect is expected to be of **minor adverse** significance, which is not significant in EIA terms.

10.11 Cumulative Effect Assessment methodology

10.11.1 Screening of other projects and plans into the Cumulative Effect Assessment

10.11.1.1 The Cumulative Effect Assessment (CEA) takes into account the impact associated with Hornsea Three together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise undertaken as part of the 'CEA long list' of projects (see volume 4, annex 5.2: Cumulative Effects Screening Matrix and Location of Schemes). Each project on the CEA long list has been considered on a case by case basis for scoping in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

10.11.1.2 In undertaking the CEA for Hornsea Three, it is important to bear in mind that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside Hornsea Three. For example, relevant projects and plans that are already under construction are likely to contribute to cumulative impact with Hornsea Three (providing effect or spatial pathways exist), whereas projects and plans not yet approved or not yet submitted are less certain to contribute to such an impact, as some may not achieve approval or may not ultimately be built due to other factors. For this reason, all relevant projects and plans considered cumulatively alongside Hornsea Three have been allocated into 'Tiers', reflecting their current stage within the planning and development process. This allows the CEA to present several future development scenarios, each with a differing potential for being ultimately built out. Appropriate weight may therefore be given to each Tier in the decision making process when considering the potential cumulative impact associated with Hornsea Three (e.g. it may be considered that greater weight can be placed on the Tier 1 assessment relative to Tier 2). An explanation of each tier is included below:

- Tier 1: Hornsea Three considered alongside other project/plans currently under construction and/or those consented but not yet implemented, and/or those submitted but not yet determined and/or those currently operational that were not operational when baseline data was collected, and/or those that are operational but have an on-going impact;
- Tier 2: All projects/plans considered in Tier 1, as well as those on relevant plans and programmes likely to come forward but have not yet submitted an application for consent (the PINS programme of projects is the most relevant source of information). Specifically, this Tier includes all projects where the developer has submitted a Scoping Report; and
- Tier 3: All projects/plans considered in Tier 2, as well as those on relevant plans and programmes likely to come forward but have not yet submitted an application for consent (the PINS programme of projects is the most relevant source of information). Specifically, this Tier includes all projects where the developer has advised PINS in writing that they intend to submit an application in the future but have not submitted a Scoping Report.

10.11.1.3 The specific projects scoped into this CEA and the Tiers into which they have been allocated, are outlined in Table 10.37. The projects included as operational in this assessment have been commissioned since the baseline studies for this project were undertaken and as such were excluded from the baseline assessment.

Table 10.37: List of other projects and plans considered within the CEA..

Tier	Phase	Project/Plan	Distance from Hornsea Three (km)	Details	Date of Construction (if applicable)	Overlap of construction phase with Hornsea Three construction phase	Overlap of operation phase with Hornsea Three operation phase
1	***Energy - Offshore wind farms***						
	Approved	Dogger Bank Creyke Beck A	89	Up to 1.2 GW (Up to 200 turbines of up to 10 MW capacity)	2021 - 2024	Yes	Yes
	Approved	Dogger Bank Creyke Beck B	115	Up to 1.2 GW (Up to 200 turbines of up to 10 MW turbines)	2021 - 2024	Yes	Yes
	Approved	Dogger Bank Teesside A&B	116	Up to 2.4 GW	2023-2026	Yes	Yes
	Under construction	Dudgeon	87	20 miles off the coast of Cromer, N North Norfolk. 560MW. 67 WTGs 402 MW	N/A	No	Yes
	Approved	East Anglia ONE	53	714MW (102x7MW)	N/A	No	Yes
	Planned	East Anglia THREE	110	Up to 1200 MW (up to 172 turbines of up to 7 – 12 MW capacity)	2020 -2022	Yes	Yes
	Under construction	Galloper	195	Up to 336 MW (56x6 MW turbines)	N/A	No	Yes
	Operational	Greater Gabbard	198	504MW (140x3.6MWturbines)	N/A	No	Yes
	Approved	Hornsea Project One - Heron Wind	14	Project One, the first development in the Zone, will comprise of up to three wind farm arrays. Project One will have a combined capacity of up to 1.2 gigawatts (GW). The offshore wind turbines for Project One will be located in the centre of the Hornsea Zone, covering an area of approximately 407km². Hornsea wind farm zone lies approximately 103 km east of the coast of Yorkshire and covers an area of approximately 4735 km2. The site has a generating capacity of 4GW to be achieved by 2020. Up to 240 5-8 MW turbines (DCO)	N/A	No	Yes
	Approved	Hornsea Project Two - Optimus Wind	20	Up to 300 6-15 MW turbines (DCO)	N/A	No	Yes
	In Operation	Humber Gateway	128	Up to 219 MW (73x3 MW turbines)	N/A	No	Yes
	Operational	LID6 1	143	6x3.6 MW Siemens turbines	N/A	No	Yes
	In Operation	Lincs	139	270 MW (75x3.6 MW)	N/A	No	Yes
	Operational	Lynn and Inner Dowsing Wind Farms	147	194 MW(54x 3.6 MW Siemens monopiles). Commissioned March 2009. 5km off the coast of Skegness.	N/A	No	Yes
	Under construction	Race Bank	114	Up to 580 MW	N/A	No	Yes
	Operational	Scroby Sands	132	60 MW (30x2 MW turbines)	N/A	No	Yes

Tier	Phase	Project/Plan	Distance from Hornsea Three (km)	Details	Date of Construction (if applicable)	Overlap of construction phase with Hornsea Three construction phase	Overlap of operation phase with Hornsea Three operation phase
	Operational	Sheringham Shoal	109	316.8 MW (88x3.6 MW) Sheringham, Greater Wash 17-23 km off North Norfolk	N/A	No	Yes
	Consented	Triton Knoll	100	750-900 MW (113-288x8 MW turbines) Greater Wash. 20 miles off the coast of Lincolnshire and 28 miles from the coast of N Norfolk Restriction on installation of 7m monopiles between 1st Sept - 16th Oct during herring spawning season	2017 - 2021	Yes	Yes
	In Operation	Westermost Rough	132	210 MW (35x6 MW)	N/A	No	Yes
2	***Energy – Offshore Wind Farms***						
	Planned	Norfolk Vanguard	94	Up to 1800 MW (between 120 - 257 turbines of up to 7 – 15 MW capacity)	2020-2022	Yes	Yes
3	***Energy – Offshore Wind Farms***						
	Pre-planning application	Norfolk Boreas	112	Up to 1800 MW	NA	NA	NA
	Pre-planning application	East Anglia TWO	112	Up to 800 MW	2022-2024	Yes	Yes

10.11.2 Maximum design scenario

10.11.2.1 The maximum design scenarios identified in Table 10.38 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative impact will be selected from the details provided in the Hornsea Three project description (volume 1, chapter 3: Project Description), as well as the information available on other projects and plans, in order to inform a 'maximum adverse scenario'. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the project Design Envelope (e.g. different turbine layout), to that assessed here be taken forward in the final design scheme.

Table 10.38: Maximum adverse scenario considered for the assessment of potential cumulative impacts on socio-economics.

Potential impact	Maximum design scenario	Justification
Construction phase		
The cumulative impact of construction of Hornsea Three on access to construction-related employment considered together with the construction and operation of other planned nearby wind farm projects.	*Tier 1* • Dogger Bank Creyke Beck A • Dogger Bank Creyke Beck B • Dogger Bank Teesside A & B • Dudgeon • East Anglia ONE • East Anglia THREE • Galloper • Greater Gabbard • Hornsea Project One - Heron Wind • Hornsea Project Two - Optimus Wind • Humber Gateway • LID6 1 • Lincs • Lynn and Inner Dowsing Wind Farms • Race Bank • Scroby Sands • Sheringham Shoal • Triton Knoll • Westermost Rough. *Tier 2* • Norfolk Vanguard *Tier 3* • Norfolk Boreas • East Anglia TWO	The projects are located in an area with current or potential use of ports in Hornsea Three Local Impact Areas (ie Humber LEP and/or New Anglia LEP). In combination with Hornsea Three, these projects may have a significant effect on the demand for construction services and labour.
The cumulative impact of construction of Hornsea Three on the amount of GVA supported by construction-related activity considered together with the construction and operation of other planned nearby wind farm projects.		The projects are located in an area with current or potential use of ports in Hornsea Three Local Impact Areas (ie Humber LEP and/or New Anglia LEP). In combination with Hornsea Three, these projects may have a significant beneficial effect on the amount of GVA supported.
The cumulative impact of construction of Hornsea Three on the demand for housing, accommodation and local services considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on the demand for housing, accommodation and local services as a result of increased demand for workers. The impact will depend on the inflow of labour from outside the local impact areas.
The cumulative impact of construction of Hornsea Three on the performance of the renewable energy sector considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant beneficial effect on the development of the renewable energy sector.
The cumulative impact of construction of Hornsea Three on offshore and coastal tourism and recreation activity and associated economic value considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on tourism and recreation if they are being constructed in the Tourism Impact Area.
The cumulative impact of construction of Hornsea Three on local tourism and recreational resources, including PRoW considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on local tourism and PRoW if they are being constructed in the Tourism Impact Area.
Operation phase		
The cumulative impact of O&M of Hornsea Three on access to O&M -related employment considered together with the construction and operation of other planned nearby wind farm projects.	*Tier 1* • Dogger Bank Creyke Beck A • Dogger Bank Creyke Beck B • Dogger Bank Teesside A & B • Dudgeon • East Anglia ONE • East Anglia THREE • Galloper • Greater Gabbard • Hornsea Project One - Heron Wind • Hornsea Project Two - Optimus Wind • Humber Gateway • LID6 1 • Lincs • Lynn and Inner Dowsing Wind Farms • Race Bank • Scroby Sands • Sheringham Shoal • Triton Knoll • Westermost Rough. *Tier 2* • Norfolk Vanguard *Tier 3* • Norfolk Boreas • East Anglia TWO	The projects are located in an area with current or potential use of ports in Hornsea Three Local Impact Areas (ie Humber LEP and/or New Anglia LEP). In combination with Hornsea Three, these projects may have a significant effect on the demand for O&M services and labour.
The cumulative impact of O&M of Hornsea Three on amount of GVA supported by O&M -related activity considered together with the construction and operation of other planned nearby wind farm projects.		The projects are located in an area with current or potential use of ports in Hornsea Three Local Impact Areas (ie Humber LEP and/or New Anglia LEP). In combination with Hornsea Three, these projects may have a significant beneficial effect on the amount of GVA supported.
The cumulative impact of O&M of Hornsea Three on the demand for housing, accommodation and local services considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on the demand for housing, accommodation and local services as a result of increased demand for workers. The impact will depend on the inflow of labour from outside the local impact areas.
The cumulative impact of O&M of Hornsea Three on the performance of the renewable energy sector considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant beneficial effect on the development of the renewable energy sector.
The cumulative impact of O&M of Hornsea Three on offshore and coastal tourism and recreation activity and associated economic value considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on tourism and recreation if they are being maintained in the Tourism Impact Area.

Potential impact	Maximum design scenario	Justification
The cumulative impact of O&M of Hornsea Three on local tourism and recreational resources, including PRoW considered together with the construction and operation of other planned nearby wind farm projects.		The projects in combination with Hornsea Three may have a significant effect on local tourism and PRoW if they are being maintained in the Tourism Impact Area.
Decommissioning phase		
The cumulative impact of decommissioning of Hornsea Three on socio-economic receptors considered together with the construction and operation of other planned nearby wind farm projects.	• *As above*	The projects in combination with Hornsea Three may have an impact when considered cumulatively.

10.12 Cumulative Effect Assessment

10.12.1.1 The significance of cumulative effects upon socio-economic receptors arising from each identified impact will be set out when the cumulative effect assessment is undertaken in full. This section sets out the screening process and selected projects for when the cumulative effect assessment will be undertaken.

10.12.1.2 The schemes which are relevant to the cumulative effect assessment have been selected based on the demands their construction and operation are likely to place on the same supply chain and labour market as Hornsea Three. The construction and O&M of Hornsea Three is limited to a relatively small number of sectors, which include:

- Specialist manufacturing and engineering activities, particularly fabricated metals, wiring machinery, engines and turbines to name a few;
- Specialist construction services, namely civil engineering projects;
- Marina transport activities; and
- Technical consultancy services.

10.12.1.3 The screening process did not identify relevant oil and gas projects that overlapped in construction with Hornsea Three which may have placed demands on similar sectors, nor relevant national infrastructure projects with the exception of Norfolk Vanguard Offshore Wind Farm which has been screened into the assessment. Therefore, the schemes which have been selected include offshore wind farm projects that are likely to draw on supply chain and labour markets in the same Local Impact Areas (i.e. Humber LEP and/or New Anglia LEP) as Hornsea Three. It is recognised that simultaneous projects being constructed onshore may increase the demands for construction workers in the Local Impact Areas. However, given the specialist nature of supply chains and workers required for offshore wind farms, other onshore projects will not be included in the cumulative effect assessment.

10.12.1.4 It is important to emphasise the uncertainty associated with the cumulative assessment. The projects which have been included are at various stages of development, and it is not certain how many of these may come forward and whether the indicated construction and O&M periods will remain the same.

10.12.1.5 Please note that the tourism and recreation receptors draw on other chapters for the cumulative effect assessment (namely chapter 4: Landscape and Visual Resources, chapter 8: noise and vibration, chapter 6: Land Use and Recreation, and volume 2, chapter 10: Seascape and Visual Resources). Therefore, the assessment of cumulative impact on these receptors reflects the projects which have been assessed cumulatively in these respective chapters. This element of the CEA has been assessed below.

10.12.2 Construction phase

The cumulative impact of construction of Hornsea Three on offshore and coastal tourism and recreation activity and associated economic value considered together with the construction and operation of other planned nearby wind farm projects.

10.12.2.1 The cumulative effects on the receptor would be driven by effects on chapter 4: Landscape and Visual Resources, chapter 8: Noise and Vibration, chapter 6: Land Use and Recreation, and volume 2, chapter 10: Seascape and Visual Resources.

Tier 1

Magnitude of impact

10.12.2.2 The chapters concluded the following:

- There were no significant cumulative effects identified on the landscape and visual receptors.
- The assessment of cumulative effect on land use and recreation also did not identify any potential significant effects
- The cumulative effects on noise and vibration concluded that no significant effects are expected during construction.
- The cumulative effect on seascape and visual resources did not identify any significant effects expected on the present day seascape character.

10.12.2.3 In light of the above assessments, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.2.4 The receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.5 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 2

Magnitude of impact

10.12.2.6 As outlined above, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.2.7 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.8 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Magnitude of impact

10.12.2.9 As outlined above, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.2.10 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.11 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

The cumulative impact of construction of Hornsea Three on local tourism and recreational resources, including PRoW considered together with the construction and operation of other planned nearby wind farm projects.

10.12.2.12 The effects on this receptor are primarily driven by the cumulative effects highlighted in chapter 6: Land use and Recreation.

Tier 1

Magnitude of impact

10.12.2.13 The cumulative assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources.

10.12.2.14 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.2.15 The receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.16 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 2

Magnitude of impact

10.12.2.17 As above, assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources.

10.12.2.18 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.2.19 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.20 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Magnitude of impact

10.12.2.21 As above, assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources.

10.12.2.22 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.2.23 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.2.24 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

10.12.3 Operation and maintenance phase

The cumulative impact of operation and maintenance of Hornsea Three on offshore and coastal tourism and recreation activity and associated economic value considered together with the construction and operation of other planned nearby wind farm projects.

10.12.3.1 The cumulative effects on the receptor would be driven by the effects of O&M on chapter 4: Landscape and Visual Resources, chapter 8: Noise and Vibration, chapter 6: Land Use and Recreation, and volume 2, chapter 10: Seascape and Visual Resources.

Tier 1

Magnitude of impact

10.12.3.2 The chapters concluded the following:

- There were no significant cumulative effects identified on the landscape and visual receptors during O&M.
- The assessment of cumulative effect of O&M on land use and recreation also did not identify any potential significant effects
- The cumulative effects on noise and vibration concluded that no significant effects are expected during O&M.
- The cumulative effect on seascape and visual resources did not identify any significant effects expected on the present day seascape character.

10.12.3.3 In light of the above assessments, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.3.4 The receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.5 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 2

Magnitude of impact

10.12.3.6 As outlined above, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.3.7 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.8 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Magnitude of impact

10.12.3.9 As outlined above, the magnitude of the cumulative effect can be reasonably expected to be **negligible**.

Sensitivity of receptor

10.12.3.10 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.11 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

The cumulative impact of operation and maintenance of Hornsea Three on local tourism and recreational resources, including PRoW considered together with the construction and operation of other planned nearby wind farm projects.

10.12.3.12 The effects on this receptor are primarily driven by the cumulative effects highlighted in chapter 6: Land Use and Recreation.

Tier 1

Magnitude of impact

10.12.3.13 The assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources during O&M.

10.12.3.14 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.3.15 The receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.16 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 2

Magnitude of impact

10.12.3.17 As above, assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources.

10.12.3.18 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.3.19 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.20 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Magnitude of impact

10.12.3.21 As above, assessment in the chapter 6: Land Use and Recreation did not identify any significant effects on tourism and recreational resources.

10.12.3.22 Therefore the magnitude of cumulative impact on the receptor is expected to be **negligible**.

Sensitivity of receptor

10.12.3.23 As above, the receptor is deemed to be of high vulnerability and high value. The sensitivity of the receptor is therefore, considered to be **high**.

Significance of Effect

10.12.3.24 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be negligible. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

10.12.4 Decommissioning phase

10.12.4.1 The cumulative impact upon socio-economic receptors during the decommissioning of Hornsea Three will be considered together with the construction and operation of other planned nearby wind farm projects.

10.13 Transboundary effects

10.13.1.1 A screening of transboundary impacts has been carried out and is presented in volume 4, annex 5.4: Transboundary Impacts Screening Note. This screening exercise identified that there was no potential for significant transboundary effects with regard to socio-economic conditions from Hornsea Three upon the interests of other EEA States.

10.13.1.2 We expect the transboundary effects which may arise to be primarily beneficial in the countries affected, as thy create demand for economic services in EEA economies. There is the potential for wider negative effects to arise due to the displacement of other products or labour, although these may be modest compared to the beneficial effects associated with the extra demand.

10.13.1.3 The scale and significance of these effects will be driven by the geography of the development's supply chain, location of ports and procurement of turbines. There will be some non-UK supply chain spend which will generate socio-economic benefits in other EEA states in the same way as it is expected to in the UK. The level of economic benefits will be dependent on levels of capacity and capability in EEA states. At this stage, there is uncertainty over the likely geography of the development's international supply chain which means that it is not possible to be definitive about the spatial distribution of supply chain spend and therefore the level of transboundary impact.

10.13.1.4 This uncertainty means that the scale of this non-UK impact as well as the countries that would benefit from it will be difficult to capture.

10.14 Inter-related effects

10.14.1.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operational and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project stages (e.g., construction-related employment, O&M of the HVAC booster station and HVDC converter/HVAC substation, and decommissioning).
- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on Socio-economics, such as may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

10.14.1.2 A description of the likely inter-related effects arising from Hornsea Three on socio-economics is provided in volume 3, chapter 11: Inter-Related Effects (Onshore).

10.15 Conclusion and summary

10.15.1.1 The analysis of the potential socio-economic impacts that would be associated with Hornsea Three will be assessed using a scenario-based approach. The approach will consider the impact of the construction, O&M and decommissioning phases of Hornsea Three on the UK as well as the Local Impact Areas: Humber LEP and New Anglia LEP.

10.15.1.2 This PEIR Chapter has set out the approach which the assessment will follow. The full assessment will draw on the most up-to-date evidence of UK content of offshore wind farms, and ongoing discussions with DONG Energy to inform the sourcing scenarios.

10.15.1.3 The chapter has provided the assessment for the tourism and recreation receptors, which will not be dependent on the UK content evidence. The assessment identified potential adverse impacts on offshore and coastal tourism and recreation, and local tourism and recreational resources and PRoW. These impacts are not expected to be significant in EIA terms.

10.16 Next Steps

10.16.1.1 Engagement with DONG Energy is ongoing, which is exploring the latest evidence on UK content of offshore wind farms which will inform the development of impact scenarios, alongside consultation with the offshore wind sector and stakeholders in the Local Impact Areas. This evidence will be used to inform the assessment to determine any significant effects.

10.16.1.2 Hornsea Three welcomes all feedback from the PEIR consultation on the work presented thus far in the PEIR, and will consult with the LEPs and economic development departments of the relevant local authorities to agree the methodology and focus of the socio-economic impact assessment that will be carried out and submitted as part of the final DCO application.

10.16.1.3 Following PEIR and the refinement of the onshore cable corridor search area, the proposed designed-in measures will be discussed and agreed with the LEPs and local authorities. The measures will be reported in the final Environmental Statement to be submitted with the DCO application.

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