

Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three Offshore Wind Farm

Environmental Statement:
Volume 3, Chapter 10 – Socio-economics

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Hornsea 3
Offshore Wind Farm

Orsted

Environmental Impact Assessment

Environmental Statement

Volume 3

Chapter 10 – Socio-economics

Liability

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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. |
| 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. |
| 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 |
|----------|--|
| CEA | Cumulative Effect Assessment |
| CORE | Centres for Offshore Renewable Engineering |
| DECC | Department of Energy and Climate Change |
| EEEGR | East of England Energy Group |
| EIA | Environmental Impact Assessment |
| FTE | Full Time Equivalent |
| GVA | Gross Value Added |
| HVAC | High Voltage Alternating Current |
| HVDC | High Voltage Direct Current |
| LEP | Local Enterprise Partnership |
| LQ | Location Quotient |
| NPPF | National Planning Policy Framework |
| NPS | National Policy Statement |
| NUTS | Nomenclature of Territorial Units for Statistics |
| O&M | Operation and Maintenance |
| ONS | Office for National Statistics |
| SEP | Strategic Economic Plan |
| PRoW | Public Rights of Way |
| SIC | Standard Industrial Classification |
| SWOT | Strengths, Weaknesses, Opportunities and Threats |

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 Environmental Statement presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the Hornsea Project Three offshore wind farm (hereafter referred to as 'Hornsea Three') on socio-economics. Specifically, this chapter considers the potential impacts of Hornsea Three which result from onshore and offshore activities, but only on onshore receptors. Impacts are considered during the construction, operation and maintenance (O&M), and decommissioning phases.
- 10.1.1.2 Those socio-economic impacts of Hornsea Three arising seaward of the Mean Low Water Springs are assessed in volume 2, chapter 10: Seascape and Visual Resources (e.g. seascape as a resource and an economic asset).
- 10.1.1.3 The tourism assessment presented in this chapter draws upon the assessments from chapter 4: Landscape and Visual Resources, chapter 6: Land Use and Recreation, chapter 8: Noise and Vibration, and chapter 7: Traffic and Transport. The full assessment of impacts of Hornsea Three on onshore landscape and visual resources, and land use and recreational resources, noise and vibration and traffic and transport are assessed in chapter 4: Landscape and Visual Resources, chapter 6: Land Use and Recreation, chapter 8: Noise and Vibration, and chapter 7: Traffic and Transport.

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) and accompanies the application to the Secretary of State for Development Consent.
- 10.2.1.2 It is intended that the Environmental Statement will provide statutory and non-statutory consultees with sufficient information to complete the examination of Hornsea Three and will form the basis of agreement on the content of the DCO.
- 10.2.1.3 In particular, this Environmental Statement chapter:
- Presents the existing socio-economic baseline established from desk studies and consultation;
 - Presents the potential environmental effects on socio-economics, tourism and recreation, based on the information gathered and the analysis and assessments undertaken;
 - Identifies any assumptions and limitations encountered in compiling the environmental information;
 - Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process; and
 - Assesses the residual effects remaining following the implementation of mitigation.

10.3 Study area

10.3.1.1 For the purpose of the socio-economic assessment, various study areas have been identified based on the receptors and impact type (see Figure 10.1 and Figure 10.2). These comprise:

- Three study areas for the assessment of employment and Gross Value Added (GVA) related effects: two local economic development study areas (comprising The New Anglia Local Enterprise Partnership (LEP) and the Humber LEP) and a national economic development study area (UK); and
- One study area for the assessment of tourism and recreation: a regional study area comprising the local authorities crossed by the Hornsea Three onshore cable corridor (namely North Norfolk, Broadland and South Norfolk).

10.3.2 Employment and GVA related effects

10.3.2.1 As noted above, three study areas have been identified for the assessment of employment and GVA related effects. In light of the uncertainty that currently exists in relation to the selection of construction and O&M ports (see volume 1, chapter 3: Project Description), two separate study areas have been identified at the local scale for employment and GVA related effects. These have been identified as New Anglia LEP area and Humber LEP area (see Figure 10.1 and Figure 10.2):

- New Anglia LEP area which is within the East Midlands region and encompasses the counties of Norfolk and Suffolk and 14 local authority districts; and
- Humber LEP area which is within the Yorkshire and Humber region and contains four local authorities.

10.3.2.2 The assessment contained within this chapter considers each of the study areas separately when considering the employment and GVA related receptors (i.e. 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 (i.e. construction and O&M), or simultaneously (e.g. providing different services)). A regional study area has not been identified for the assessment due to the reduced importance of regions within economic development policy following the abolition of Regional Development Agencies in 2012 and their replacement by LEPs.

10.3.2.3 The third study area for the purpose of assessing employment and GVA effects is the national study area which 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.

10.3.3 Tourism and Recreation related effects

10.3.3.1 The socio-economic effects on tourism and recreation are expected to be limited to those experienced within the local authority areas through which the Hornsea Three onshore cable corridor crosses. Therefore, the tourism and recreation study area has been defined as the local authorities of North Norfolk, Broadland and South Norfolk (see Figure 10.3).

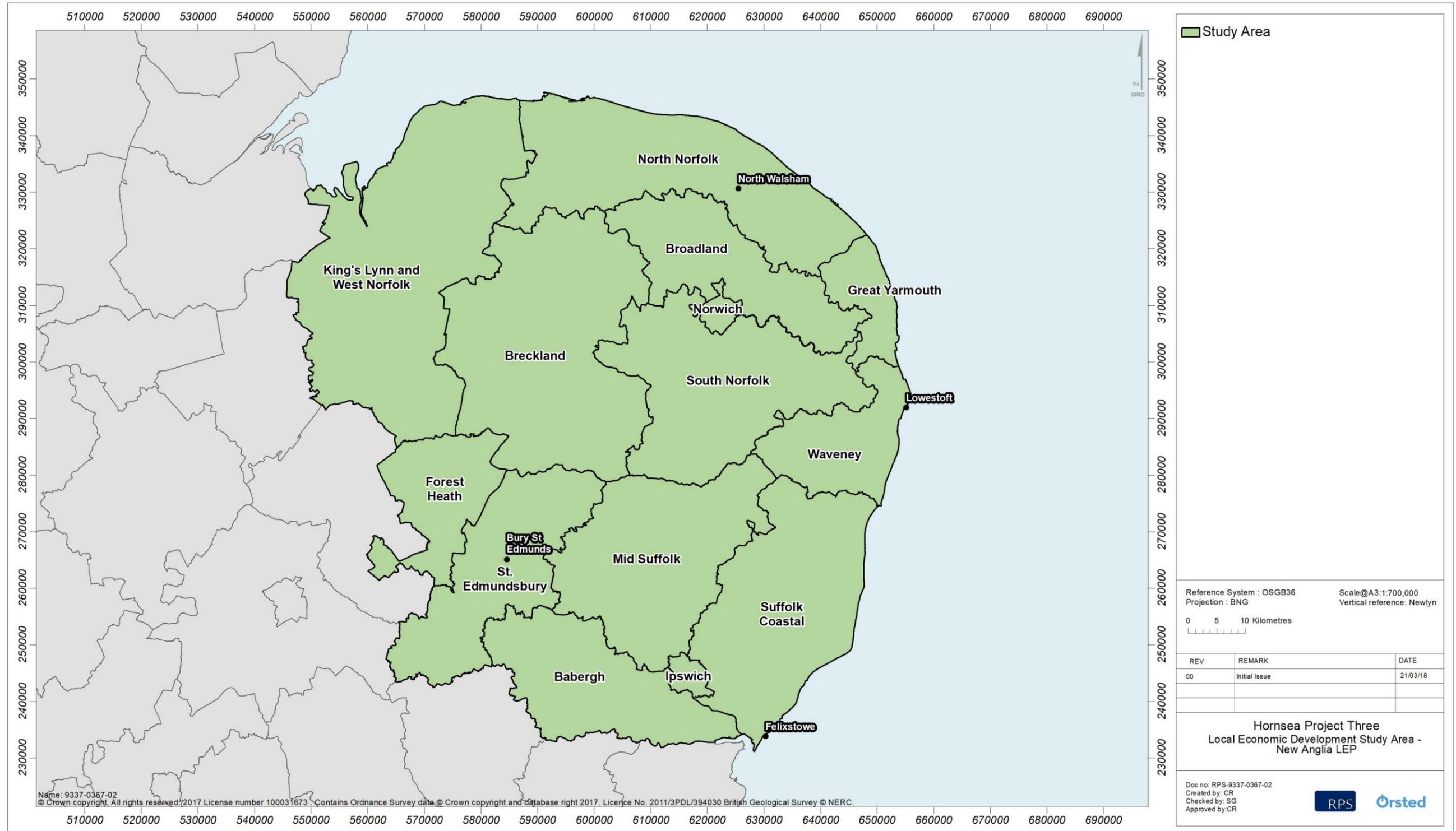


Figure 10.1: Local Economic Development Study Area – New Anglia LEP.

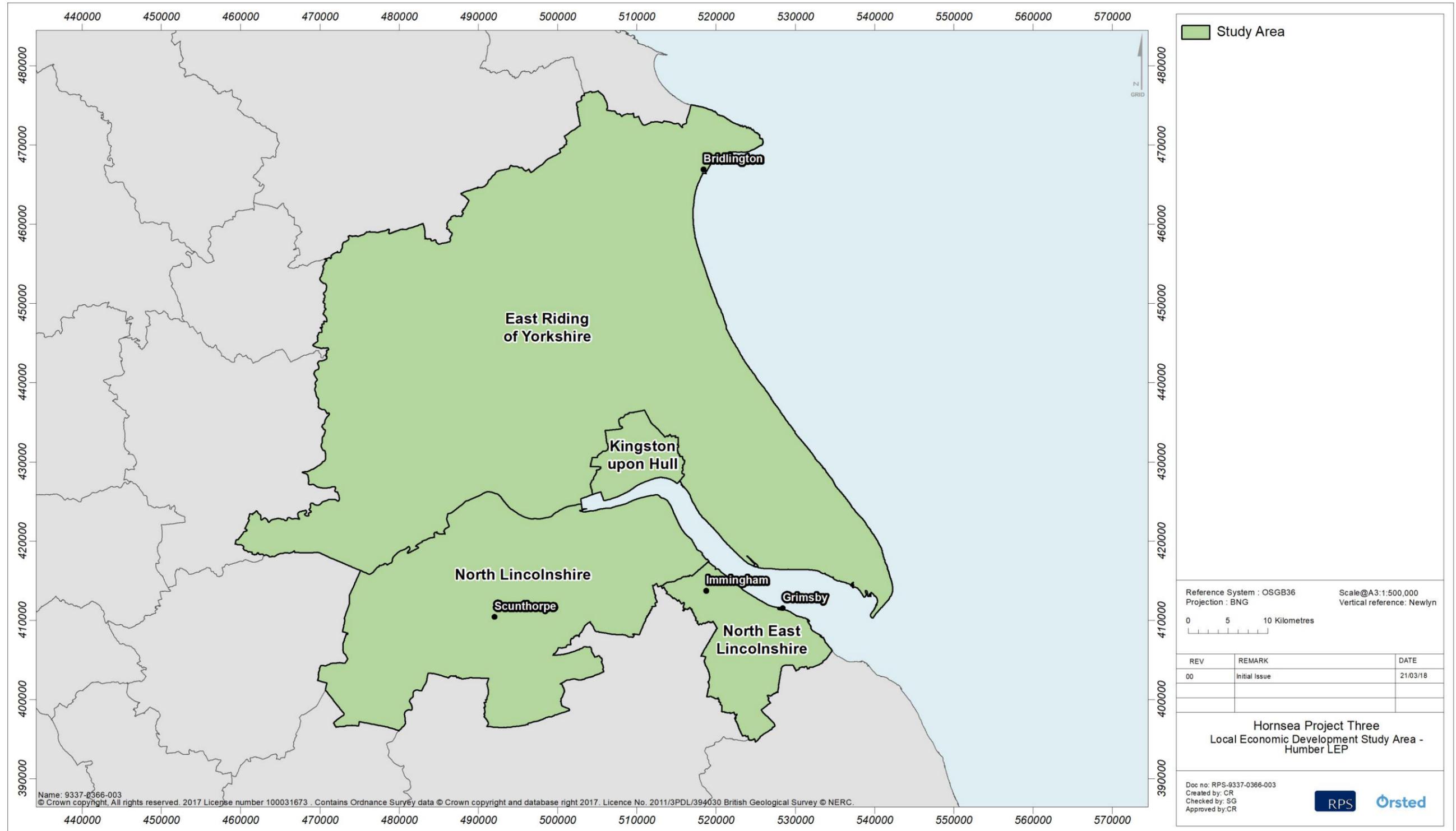


Figure 10.2: Local Economic Development Study Area - Humber LEP.

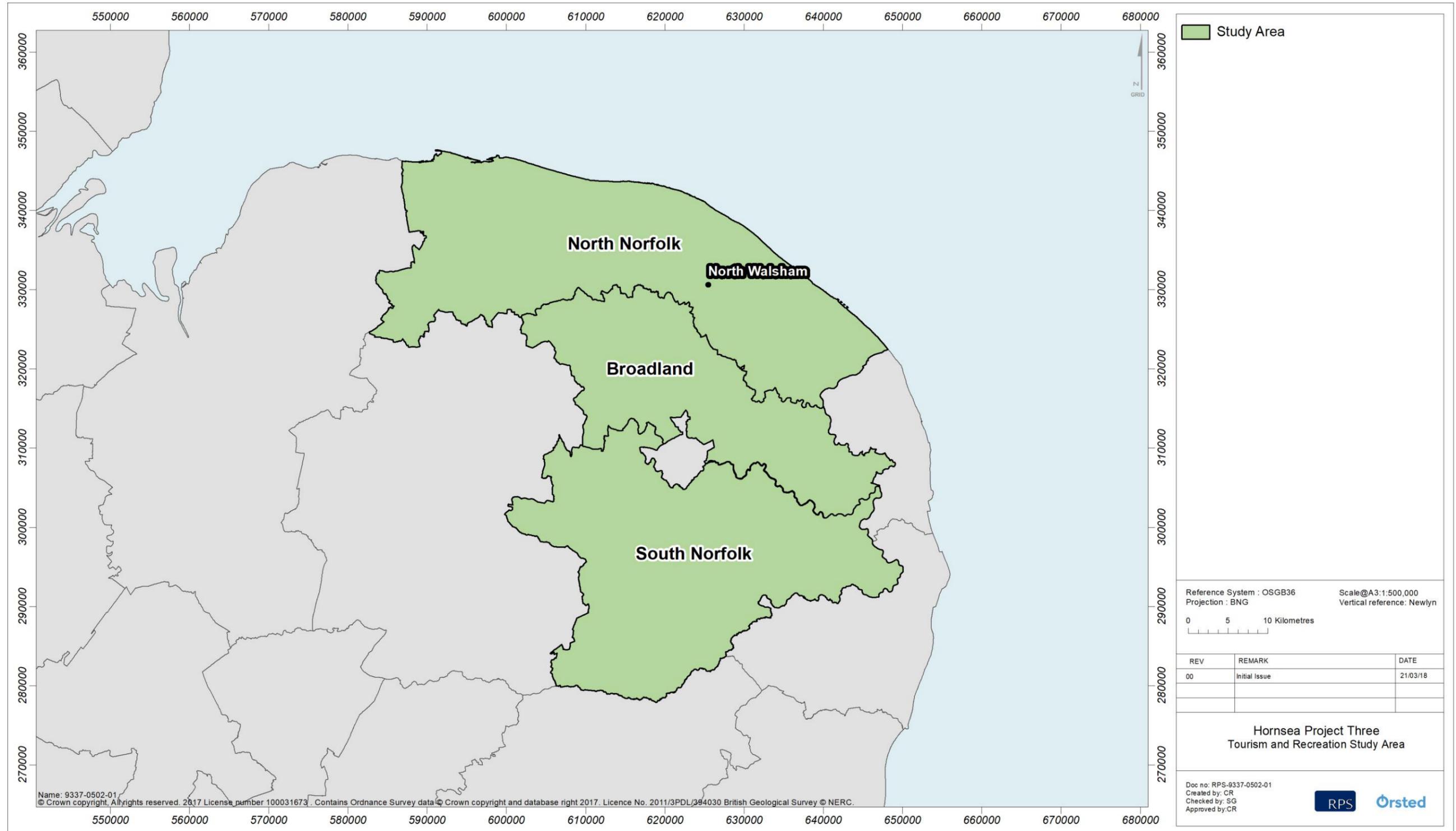


Figure 10.3: Tourism and Recreation Study Area.

10.4 Planning policy context

10.4.1 National Policy Statements

10.4.1.1 Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects, specifically in relation to socio-economics, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a), the NPS for Renewable Energy Infrastructure (EN-3) (DECC, 2011b) and the NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c). Neither NPS EN-3 nor 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 Environmental Statement |
|--|---|
| This assessment should consider the likely socio-economic impacts at a local or regional level (paragraph 5.12.2 of NPS EN-1). | Socio-economic effects are assessed at local levels as defined by the New Anglia and Humber Local Economic Development Study Areas. Employment effects are considered under the assessment of the effect of Hornsea Three construction on employment (paragraphs 10.11.1.3 to 10.11.1.32). Employment effects associated with O&M activity is assessed in paragraphs 10.11.2.3 to 10.11.2.25. The employment effects during the decommissioning phase are assessed in paragraphs 10.11.3.7 to 10.11.3.16. The potential training opportunities associated with Hornsea Three are assessed qualitatively as part of the assessment of the Access to Employment Amongst Local Residents receptors in the construction and O&M phases. For construction related commentary see paragraphs 10.11.1.55 to 10.11.1.80. For O&M related commentary, see paragraphs 10.11.2.56 to 10.11.2.67. |
| 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 are considered under the assessment of the effect of Hornsea Three construction on employment (paragraphs 10.11.1.3 to 10.11.1.32). Employment effects associated with O&M activity is assessed in paragraphs 10.11.2.3 to 10.11.2.25. The employment effects during the decommissioning phase are assessed in paragraphs 10.11.3.7 to 10.11.3.16. The potential training opportunities associated with Hornsea Three are assessed qualitatively as part of the assessment of the Access to Employment Amongst Local Residents receptors in the construction and O&M phases. For construction related commentary see paragraphs 10.11.1.55 to 10.11.1.80. For O&M related commentary, see paragraphs 10.11.2.56 to 10.11.2.67. |

| Summary of NPS EN-1 provision | How and where considered in the Environmental Statement |
|---|---|
| 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 are considered under the assessment of local effects during construction and O&M. Effects during the construction phase are considered in paragraphs 10.11.1.81 to 10.11.1.91. Effects during the O&M phase are considered in paragraphs 10.11.2.77 to 10.11.2.84. Effects during the decommissioning phase are considered in paragraphs 10.11.3.1 to 10.11.3.39. The assessment of effects on demand for and provision of local services is considered in the assessment of the housing, accommodation and local services receptor. The focus of the assessment is on demand created as a result of employment impacts associated with 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 socio-economic effects on tourism and recreation are addressed under the assessment of effects on receptors relating to offshore tourism/recreation activities, coastal tourism and onshore tourism/recreational resources. The effects during the construction phase are assessed in paragraphs 10.11.1.125 to 10.11.1.132. Effects during O&M are assessed in paragraphs 10.11.2.102 to 10.11.2.117. Effects associated with decommissioning activity are assessed in paragraph 10.11.3.43 to 10.11.3.52. |
| 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 is assessed as part of the assessment of receptors relating to the demand for housing, accommodation and local services during the construction phase, the O&M phase and the decommissioning phase. Effects during the construction phase are considered in paragraphs 10.11.1.49 to 10.11.1.80. Effects during the O&M phase are considered in paragraphs 10.11.1.81 to 10.11.1.91. Effects during the decommissioning phase are considered in paragraph 10.11.3.39. |
| 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). | The cumulative socio-economic effects are assessed under section 10.13 of this chapter. |
| The applicant should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies. | The existing socio-economic conditions in each of the identified study areas are presented in Section 10.7.2. The correlation between local planning policies and the socio-economic impacts of Hornsea Three are set out in Section 10.7.1. |

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 Environmental Statement |
|---|---|
| Planning Inspectorate (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 consider 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 provides evidence throughout of likely socio-economic impact considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning). Pre-construction and construction impacts are considered in section 10.11.1. Impacts in the O&M phase are outlined in section 10.11.2. Impacts in the decommissioning phase are outlined in section 10.11.3. 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 section 10.10. |
| The assessment should consider whether mitigation measures are necessary to mitigate any adverse socio-economic impacts of the development. For example, high quality design can improve the visual and environmental experience for visitors and the local community alike (paragraph 5.12.9 of NPS EN-1). | Proposed mitigation measures are presented in Section 10.10. |

10.4.2 Other relevant policies

10.4.2.1 A number of other policies are relevant to socio-economics including:

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

10.4.2.2 Key provisions of these policies are set out in Table 10.3 along with details as to how these have been addressed within the assessment. Details of the NPPF are set out in Table 10.3 below.

Table 10.3: Summary of other relevant policies relevant to socio-economics.

| Summary of provision | How and where considered in the Environmental Statement |
|--|---|
| National Planning Policy Framework | |
| 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: <ul style="list-style-type: none"> • 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. | The impact of Hornsea Three on the economic and social conditions are assessed in section 10.11. |
| Local Planning Policy | |
| "The local economy will be developed in a sustainable way to support jobs and economic growth in both urban and rural locations" (Policy 5 of the Joint Core Strategy for Broadland, Norwich and South Norfolk). | The impact of Hornsea Three on the labour market and economic growth is assessed in section 10.11. |
| 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" (Policy 21 of the Joint Core Strategy for Broadland, Norwich and South Norfolk). | The impact of Hornsea Three on the economic and social conditions are assessed in section 10.11, including those with positive effects. |
| "Large scale renewable energy proposals should deliver economic, social, environmental or community benefits that are directly related to the proposed development and are of reasonable scale and kind to the local area." (Policy EN 7 of the North Norfolk Core Strategy). | The impact of Hornsea Three on the economic and social conditions are assessed in section 10.11, including those with positive effects. |
| Marine Policy Statement | |
| 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 provides evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning). Pre-construction and construction impacts are considered in section 10.11.1. Impacts in the O&M phase are outlined in section 10.11.2. Impacts in the decommissioning phase are outlined in section 10.11.3. |

| Summary of provision | How and where considered in the Environmental Statement |
|---|---|
| <p>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.</p> | <p>The Hornsea Three assessment provides evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning). Pre-construction and construction impacts are considered in section 10.11.1. Impacts in the O&M phase are outlined in section 10.11.2. Impacts in the decommissioning phase are outlined in section 10.11.3.</p> <p>Potential impacts on other marine users are considered in volume 2, chapter 6: Commercial Fisheries and volume 2, chapter 11: Infrastructure and Other Users.</p> |
| <p>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.</p> | <p>The Hornsea Three assessment provides evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning). Pre-construction and construction impacts are considered in section 10.11.1. Impacts in the O&M phase are outlined in section 10.11.2. Impacts in the decommissioning phase are outlined in section 10.11.3.</p> |
| <p>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.</p> | <p>The Hornsea Three assessment provides evidence throughout of likely socio-economic impacts considering the project lifecycle (i.e. pre-construction, construction, operation and decommissioning). Pre-construction and construction impacts are considered in section 10.11.1. Impacts in the O&M phase are outlined in section 10.11.2. Impacts in the decommissioning phase are outlined in section 10.11.3. Potential impacts on tourism are considered in sections 10.11.1, 10.11.2 and 10.11.3 of the Environmental Statement.</p> |

10.5 Consultation

10.5.1.1 Table 10.4 below summarises the issues raised relevant to socio-economics, which have been identified during consultation activities to date. Table 10.4 also indicates either how these issues have been addressed within this Environmental Statement or how the Applicant has had regard to them. Further information on the consultation activities undertaken for Hornsea Three can be found in the Consultation Report (document reference number A5.1) that accompanies the application for Development Consent.

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 |
|---------------|---|--|--|
| November 2016 | East of England Energy Group (EEEGR) | Orsted meet with EEEGR early in the development process (November 2016) to introduce the Project, and subsequently participated in their annual conference (March 2017), which was attended by a number of local suppliers. | The engagement with representatives from EEEGR helped to inform the supply chain analysis of the baseline for New Anglia LEP and the assessment of receptors. |
| December 2016 | PINS - Scoping Opinion | The Scoping Report (see volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion) 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 Environmental Statement. | The study areas are explained in section 10.3 and Figure 10.1 and Figure 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 LEP. | 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 economic development study areas is considered as part of the assessment of the access to employment receptors during the construction and O&M phases of Hornsea Three. This chapter has been informed by consultations with LEP representatives where possible. |
| 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 State 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. The assessment of impacts is carried out using a bespoke impact model. The Environmental Statement chapter has been informed by consultations with LEP representatives where possible. |
| December 2016 | Norfolk County Council -Scoping 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 2, chapter 11: Infrastructure and Other Users of the Environmental Statement. The Environmental Statement considers potential cumulative impacts in each topic chapter. |
| December 2016 | Norfolk County Council - Scoping 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 2, chapter 7: Shipping and Navigation. The Environmental Statement considers potential cumulative impacts in each topic chapter. |
| December 2016 | Norfolk County Council - Scoping Response | Tourism – The EIA should consider the likely impacts on Norfolk’s tourism sector. | Matters relating to land based tourism are considered in, chapter 6: Land Use and Recreation. Marine based recreational users are considered in volume 2, chapter 11: Infrastructure and Other Users. Potential socio-economic impacts on tourism are also considered in this chapter in sections 10.11.1, 10.11.2, and 10.11.3. |
| December 2016 | Norfolk County Council - Scoping 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 Environmental Statement sets out in Section 10.11 the potential job creation through each phase of Hornsea Three for New Anglia. |

| Date | Consultee and type of response | Issues raised | Response to issue raised and/or where considered in this chapter |
|----------------|---|---|---|
| September 2017 | Broadland District Council -S42 Response | <p>Although in the long term there could be significant benefit to Norfolk residents through cheaper electricity costs it must be remembered that there will be considerable inconvenience during the construction period.</p> <p>The council would seek as much financial and commercial benefit as possible to be provided in Norfolk during the construction period with serious consideration being given to the use of the Port of Great Yarmouth as a priority over ports in Lincolnshire, accepting that more than one port may be required and used.</p> <p>The council would wish to seek assurance that as much employment, use of local services and businesses as possible is provided to the local communities too.</p> | <p>The Environmental Statement includes a clear statement which explains the factors that will make it difficult to be specific about how much economic benefit will be realised in specific localities.</p> <p>The number of construction and O&M jobs which may be created by Hornsea Three are presented in Section 10.11.</p> |
| September 2017 | Norfolk County Council - S42 Response | <p>Socio-Economic Issues</p> <p>2.16 The County Council strongly encourage, on economic development grounds and supporting the Norfolk economy, DONG Energy to use the Port facilities at Great Yarmouth for:</p> <ul style="list-style-type: none"> • Construction; assembly and manufacture of windfarm components; and • Operations and maintenance. | <p>It is not possible at this stage to be definitive about the choice of ports for Hornsea Three.</p> <p>The assessment of economic benefits which is considered at the level of New Anglia LEP includes scenarios on varying use of ports in the area for construction and O&M of Hornsea Three.</p> <p>The economic impact assessment of economic benefits is presented in Section 10.11.</p> |
| September 2017 | Great Yarmouth Borough Council - S42 Response | <p>Policy CS6 of the adopted Great Yarmouth Core Strategy states that port related development proposals will be supported by encouraging a greater presence of higher value technology and energy-based industries in the Borough. It is, therefore, welcomed that Great Yarmouth is acknowledged as having the greatest potential to benefit from the proposed development given our supply chain capacity and capability. Great Yarmouth is the centre for the offshore energy industry in England, with a 50 year history of supporting the offshore oil and gas industry and the burgeoning offshore wind sector. The port of Great Yarmouth is currently involved in the construction of two new windfarms, Galloper and East Anglia ONE and is the operations and maintenance base for the original offshore windfarm at Scroby Sands and Statoil's new Dudgeon Windfarm. Great Yarmouth has developed a wide-ranging supply chain of local companies to support the oil, gas and offshore wind sectors.</p> | <p>The baseline section sets out these activities in Great Yarmouth and the potential of the port to be used for construction and O&M.</p> <p>The economic impact assessment on employment and GVA receptors has considered the potential of ports in New Anglia being used for construction and O&M, with quantified economic benefits presented in Section 10.11.</p> |
| December 2017 | Broadland District Council - S42 Response | <p>I would like to see an economic benefit to Norfolk. At your consultation I was told that the proposed offshore windfarm would be equidistant from both Humberside and Great Yarmouth ports. I therefore ask that you should use Great Yarmouth as your principle port in preference to Humberside. I understand that the Vattenfall Vanguard Project will be using the port of Great Yarmouth and around 150 skill jobs will be created, I would like your project to also deliver a significant number of skilled jobs to Norfolk and where possible to employ local contractors.</p> | <p>The economic impact assessment uses scenarios to illustrate the potential use of ports in both the Humber and New Anglia areas. The assessment of economic benefits is presented in Section 10.11.</p> |
| November 2017 | Humber LEP | <p>Engagement with representatives from Humber LEP focused on the nature of the skills base in the Humber area and the potential for residents from the Humber LEP are to benefit from employment created by Hornsea Three. The LEP report being supportive of the project and see this as providing potential economic opportunity for the Humber LEP area.</p> | <p>This engagement with representatives from Humber LEP helped to inform the socio-economic baseline and the assessment of receptors.</p> |

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 the policy documents set out below, and the relevant national datasets from the Office for National Statistics (ONS) providing data on population, labour market and employment base conditions at the national and local levels. Where data is not available at the UK level (for example, ONS employment data is available for Great Britain rather than the United Kingdom), this is clearly denoted within the commentary.
- 10.6.1.2 Information within the Hornsea Three socio-economic study areas was collected through a detailed desktop review of existing studies and datasets. The analysis draws on the most up to date sources of data available at November 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 for all socio-economic indicators is referenced throughout the chapter but also included in Table 10.5.

Table 10.5: Summary of key desktop sources.

| Economic indicator | Source | Year | Author |
|---|--|------|---|
| Population | ONS Mid-year population estimates | 2017 | ONS |
| Employment and economic activity | ONS Annual Population Survey | 2017 | ONS |
| Unemployment | ONS Annual Population Survey | 2017 | ONS |
| Job Seeker's Allowance | ONS Claimant Count | 2017 | ONS |
| Qualifications of residents | ONS Annual Population Survey | 2017 | ONS |
| Occupations of residents | ONS Annual Population Survey | 2017 | ONS |
| Sectoral and size band structure of the business base | ONS UK Business Counts | 2017 | ONS |
| Sectoral and size band structure of the employment base | ONS Business Register and Employment Survey | 2017 | 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 | 2016 | ONS |
| Workplace and residence based earnings | ONS Annual Survey of Hours and Earnings | 2017 | 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 have been undertaken to inform the EIA for socio-economics. This is because there is sufficient reliable data available via published data and information sources to inform the characterisation of the baseline environment relating to the socio-economic receptors. The approach is consistent with the methodology set out in the Hornsea Three Scoping Report (see volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion).

10.7 Baseline environment

10.7.1 Policy Baseline

- 10.7.1.1 To inform the socio-economic baseline, policies which do not specifically relate to Hornsea Three, but do help to set the socio-economic context, have been examined. These are described below.

UK Economic Development Policy

- 10.7.1.2 The most recent addition to industrial strategy and the centre-piece of the current government's economic agenda is the November 2017 White Paper titled "Industrial Strategy: building a Britain fit for the future" (HM Government, 2017). The underlying motivation of the strategy is to "create an economy that boosts the productivity and earning power throughout the UK".
- 10.7.1.3 The Government identified five foundations of productivity that align to the economic vision. The foundations will support the creation of high value jobs and skills (People); investment and sector growth through Sector Deals (Business Environment); innovation and research & development investment (Ideas); investment in digital, transport, housing, low carbon and other infrastructure (Infrastructure); and developing Local Industrial Strategies which focus on local strengths (Places).
- 10.7.1.4 In addition, four Grand Challenges have been set for the Government and the economy as a response to global opportunities: artificial intelligence, clean growth, future of mobility, and ageing society. Clean Growth has been identified as one of the main opportunities for the UK economy to take advantage of, through the "development, manufacture and use of low carbon technologies, systems and services". Offshore wind is one of the areas where the UK has been identified as having world-leading capabilities, and the Strategy aims to maximise the share of the global markets taken up by UK businesses in the sector. In support of this, the UK Government has committed to increasing support for innovation to reduce the costs of clean technologies, systems and services.
- 10.7.1.5 The importance of renewable energy and specifically offshore technologies, to the UK's economic policy is illustrated by the commitments made by DECC and the Department for Business, Innovation and Skills (which have now been combined into the Department for Business, Energy and Industrial Strategy) to maximising the economic benefit of renewable energy, especially offshore wind farm developments.

10.7.1.6 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.

10.7.1.7 The Offshore Wind Industrial Strategy published in 2013 (HM Government, 2013) highlights that it is a government goal to strengthen the 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.

Local Economic Development Policy

10.7.1.8 National aspirations in relation to private sector-led economic growth and employment creation are echoed in the strategic aims of key organisations in both Hornsea Three local economic development study areas (New Anglia LEP and Humber LEP). Here, the focus of economic policy is to close the gap between local and national economic performance.

New Anglia

10.7.1.9 New Anglia LEP's recent Economic Strategy for Norfolk and Suffolk (New Anglia LEP, 2017) builds on the progress achieved since the 2014 Strategic Economic Plan (2012) and sets a vision up to 2036 for the area. Energy remains a key sector for New Anglia, with the long-standing presence of oil and gas, nuclear and offshore wind. The coast around Great Yarmouth and Lowestoft is an offshore wind cluster with £50bn of investment in clean energy planned up to 2020. Great Yarmouth and Lowestoft are one of the six COREs in the UK, and have gained status as the East of England Energy Zone. The EEEGR is well established in the area and works to accelerate the development of the energy supply chain in the East of England.

10.7.1.10 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, Sheringham Shoal and Dudgeon Offshore Wind Farm to name a few, have drawn on ports and supply chain in New Anglia either for construction or operation activities.

10.7.1.11 The Strategy identified the following targets between 2017 and 2036:

- Delivering 88,000 net new jobs;
- Growing the economy by £17.5bn in real terms;
- Share of population with NVQ3+ to increase to 66%;

- Creating 30,000 new businesses;
- Increasing economic activity;
- Increasing productivity to £39 GVA per hour;
- Increasing median wages by £200 more per week; and
- Delivering 140,000 new homes.

10.7.1.12 Growing the priority sectors will be crucial in achieving these objectives. Advanced manufacturing and engineering, agri-tech, ICT and digital creative, construction, tourism, transport and logistics, the life sciences and biotech, and the financial services and insurance sector have been identified as the nine priority sectors for New Anglia. These sectors present an opportunity for the Norfolk and Suffolk economy each in its own right, as well as in cross-collaboration.

10.7.1.13 The strategic objectives of New Anglia's Strategic Economic Plan (SEP) are underpinned by Core Strategies of local authorities comprising the area covered by New Anglia LEP. The following strategies have been summarised that are particularly relevant for Hornsea Three, based on the location of onshore cable corridor 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

- 10.7.1.14 The Humber LEP covers four local authorities. 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).
- 10.7.1.15 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.
- 10.7.1.16 The strategic plan 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.
- 10.7.1.17 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.
- 10.7.1.18 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 minimized 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 economic development study 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, Orsted 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.

10.7.2 Socio-economic baseline for Local Economic Development Study Areas

- 10.7.2.1 The baseline conditions are assessed in turn for the two local economic development study areas – New Anglia and the Humber LEPS. The two local economic development study areas, New Anglia and the Humber LEPS 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 that have the potential to play a role in construction and O&M of Hornsea Three.

10.7.2.2 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.

10.7.2.3 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 (i.e. construction and O&M), or simultaneously (e.g. providing different services).

10.7.2.4 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 economic development study areas.

New Anglia LEP local economic development study area

10.7.2.5 New Anglia LEP is relatively large, 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 economic development study 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 economic development study area.

Population structure

10.7.2.6 The New Anglia local economic development study area has a population of over 1.6 million people, of which 970,000 are of working age. This represents 59%, which is lower than the national average of 63% of the population being of working age. The statistics vary within the LEP, with working age percentage varying between 54% (North Norfolk, which could be due to its rural nature) to 68% (Norwich, which could be due to its role as a significant employment centre). The population structure for New Anglia LEP is summarised in Table 10.6.

Table 10.6: Population: total and working age, New Anglia LEP 2016.

| Area | Population (000s) | Working Age Population (000s) | Working Age Population as % of Total |
|----------------|-------------------|-------------------------------|--------------------------------------|
| Babergh | 89 | 51 | 57% |
| Breckland | 137 | 80 | 58% |
| Broadland | 127 | 75 | 58% |
| Forest Heath | 64 | 40 | 62% |
| Great Yarmouth | 99 | 58 | 59% |

| Area | Population (000s) | Working Age Population (000s) | Working Age Population as % of Total |
|------------------------------|-------------------|-------------------------------|--------------------------------------|
| Ipswich | 136 | 86 | 64% |
| King's Lynn and West Norfolk | 152 | 87 | 57% |
| Mid Suffolk | 100 | 59 | 59% |
| North Norfolk | 104 | 56 | 54% |
| Norwich | 141 | 96 | 68% |
| South Norfolk | 133 | 77 | 58% |
| St Edmundsbury | 113 | 68 | 60% |
| Suffolk Coastal | 126 | 71 | 56% |
| Waveney | 117 | 66 | 56% |
| New Anglia LEP | 1,638 | 970 | 59% |
| United Kingdom | 65,648 | 41,444 | 63% |

Source: ONS Population Estimates 2016 (ONS, 2017a). Numbers are rounded to nearest 1,000.

Labour market indicators

10.7.2.7 Around 80% of New Anglia's local economic development study area 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 Forest Heath (85%) and St Edmundsbury (85%) and the more rural Broadland (85%) and Suffolk Coastal (85%).

10.7.2.8 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.

10.7.2.9 These include the coastal town of Great Yarmouth, which has lower than average economic activity rates (74%), and correspondingly employment (70%) compared to the rest of New Anglia. Its neighbouring district - North Norfolk – has the lowest economic activity and employment rates across New Anglia, 74% and 70% respectively. Waveney also has an employment rate of 70%.

10.7.2.10 Labour market performance is set out in Table 10.7.

Table 10.7: Labour market performance, New Anglia LEP 2017.

| Area | Economically active | | In Employment | | Economically inactive | |
|------------------------------|---------------------|--------------------------|---------------|--------------------------|-----------------------|--------------------------|
| | Number (000s) | % Working Age Population | Number (000s) | % Working Age Population | Number (000s) | % Working Age Population |
| North Norfolk | 40 | 74% | 38 | 70% | 14 | 27% |
| Great Yarmouth | 45 | 78% | 41 | 70% | 13 | 22% |
| Waveney | 49 | 75% | 46 | 70% | 17 | 25% |
| South Norfolk | 64 | 82% | 63 | 81% | 14 | 18% |
| Broadland | 61 | 85% | 59 | 82% | 11 | 15% |
| Breckland | 61 | 78% | 60 | 76% | 18 | 22% |
| King's Lynn and West Norfolk | 66 | 78% | 64 | 75% | 19 | 22% |
| Suffolk Coastal | 58 | 85% | 56 | 82% | 11 | 15% |
| Mid Suffolk | 48 | 82% | 45 | 77% | 11 | 18% |
| St Edmundsbury | 55 | 83% | 54 | 82% | 11 | 17% |
| Forest Heath | 33 | 85% | 32 | 83% | 6 | 15% |
| Babergh | 38 | 78% | 36 | 73% | 11 | 22% |
| Ipswich | 66 | 77% | 63 | 74% | 20 | 23% |
| Norwich | 76 | 79% | 72 | 74% | 20 | 21% |
| New Anglia LEP | 760 | 80% | 728 | 76% | 195 | 20% |
| United Kingdom | 31,992 | 78% | 30,488 | 74% | 9,089 | 22% |

Source: ONS, Annual Population Survey 2017 (ONS, 2017b). Numbers are rounded to nearest 1,000.

10.7.2.11 Table 10.8 provides a snapshot of unemployment across New Anglia's local authorities. The average unemployment rate across the New Anglia local economic development study area is 4%, 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 33,000 people unemployed across New Anglia, the largest share of whom are in Norwich (4,000).

Table 10.8: Unemployment, New Anglia LEP 2017.

| Area | Number unemployed (000s) | Unemployment rate (% econ. active population) |
|------------------------------|--------------------------|---|
| Babergh | 1 | 4% |
| Breckland | 2 | 4% |
| Broadland | 2 | 3% |
| Forest Heath | 1 | 3% |
| Great Yarmouth | 3 | 7% |
| Ipswich | 3 | 5% |
| King's Lynn and West Norfolk | 3 | 4% |
| Mid Suffolk | 2 | 3% |
| North Norfolk | 2 | 4% |
| Norwich | 4 | 5% |
| South Norfolk | 2 | 3% |
| St Edmundsbury | 2 | 4% |
| Suffolk Coastal | 2 | 3% |
| Waveney | 3 | 6% |
| New Anglia LEP | 33 | 4% |
| United Kingdom | 1,504 | 5% |

Source: ONS, Annual Population Survey 2017 (ONS, 2017b). Numbers are rounded to nearest 1,000.

10.7.2.12 A more up to date measure of unemployment is the claimant count data, which measures the number of people claiming out of work benefits¹. Figure 10.4 shows the average number of claimants annually between 2006 and 2016. It is evident that claimant numbers have decreased drastically since 2012, and in 2017 there were approximately 14,200 claimants in New Anglia, representing 1.5% of the working age population. This is below the national rate of 1.9%, as has been the case historically.

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.

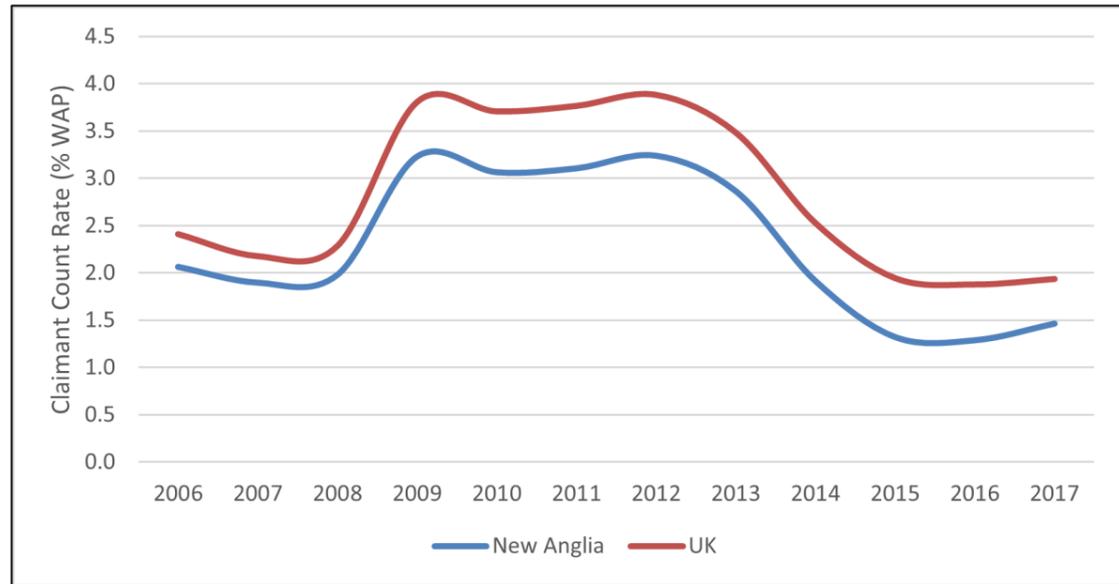


Figure 10.4: Claimant count rate, 2006-2017.

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

10.7.2.13 The skills profile of the New Anglia study area is below the national average in terms of proportion of working age population with higher level skills (i.e. level four and above): 31% of local residents have higher level skills compared to almost 38% across the UK². However, there are some significant variations within New Anglia itself (see Table 10.9), for example:

- Norwich has got the highest concentration of higher level skills (Level 4+), with 39% of working age population educated to degree level or above. Waveney and Great Yarmouth, however, are at the other end of the spectrum have lower concentrations with 21% and 23% of working age residents respectively qualified to level four and above; and
- The proportion of people with no qualifications in New Anglia is similar to that in the UK, with 8% in both areas. Some local authorities within the area have a higher representation of these, most notable Great Yarmouth (14%).

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 | 16 | 33% | 7 | 13% | 2 | 5% | 18 | 0 | 2 | 4% |
| Breckland | 24 | 30% | 17 | 21% | 3 | 4% | 23 | 0 | 5 | 6% |
| Broadland | 20 | 29% | 12 | 17% | 2 | 4% | 25 | 0 | 6 | 8% |
| Forest Heath | 13 | 33% | 6 | 16% | 3 | 6% | 10 | 0 | 4 | 10% |
| Great Yarmouth | 13 | 23% | 7 | 11% | * | * | 25 | 0 | 8 | 14% |
| Ipswich | 26 | 31% | 11 | 13% | 4 | 5% | 31 | 0 | 6 | 7% |
| King's Lynn and West Norfolk | 21 | 25% | 17 | 20% | 4 | 4% | 21 | 0 | 10 | 12% |
| Mid Suffolk | 19 | 32% | 10 | 17% | 4 | 6% | 20 | 0 | 4 | 6% |
| North Norfolk | 16 | 28% | 8 | 14% | 3 | 5% | 22 | 0 | 5 | 8% |
| Norwich | 37 | 39% | 16 | 17% | 3 | 3% | 26 | 0 | 6 | 6% |
| South Norfolk | 32 | 42% | 15 | 19% | 3 | 3% | 20 | 0 | 5 | 6% |
| St Edmundsbury | 22 | 33% | 14 | 21% | 3 | 4% | 18 | 0 | 5 | 7% |
| Suffolk Coastal | 25 | 37% | 14 | 21% | 2 | 3% | 21 | 0 | 2 | 3% |
| Waveney | 13 | 21% | 10 | 16% | * | * | 28 | 0 | 7 | 10% |
| New Anglia LEP | 298 | 31% | 163 | 17% | 35 | 4% | 309 | 0 | 73 | 8% |
| United Kingdom | 15,549 | 38% | 6,997 | 17% | 1288 | 3% | 10,987 | 0 | 3,381 | 8% |

Source: ONS, Annual Population Survey 2016 (ONS, 2017b). Numbers are rounded to nearest 1,000. *data unavailable due to small sample size.

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.

10.7.2.14 The occupations profile of New Anglia’s residents is representative of the skills profile described in Table 10.10³. A similar proportion of residents are employed in high skill occupations than nationally (24% in both). There are significant spatial differences within New Anglia: South Norfolk (33%), Broadland (30%), Suffolk Coastal (28%) and Babergh (28%) 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 | 28% | 13 | 27% | 12 | 25% |
| Breckland | 16 | 21% | 25 | 31% | 23 | 29% |
| Broadland | 21 | 30% | 22 | 30% | 18 | 25% |
| Forest Heath | 9 | 23% | 10 | 24% | 13 | 33% |
| Great Yarmouth | 13 | 23% | * | * | 21 | 36% |
| Ipswich | 17 | 19% | 20 | 23% | 29 | 34% |
| King’s Lynn and West Norfolk | 16 | 19% | 21 | 24% | 30 | 35% |
| Mid Suffolk | 14 | 23% | 18 | 30% | 16 | 26% |
| North Norfolk | 14 | 24% | 15 | 26% | 13 | 22% |
| Norwich | 23 | 24% | 21 | 22% | 32 | 34% |
| South Norfolk | 25 | 33% | 21 | 28% | 23 | 30% |
| St Edmundsbury | 16 | 24% | 22 | 32% | 20 | 30% |
| Suffolk Coastal | 19 | 28% | 21 | 32% | 18 | 27% |
| Waveney | 11 | 17% | 15 | 24% | 23 | 37% |
| New Anglia LEP | 228 | 24% | 255 | 27% | 290 | 30% |
| United Kingdom | 9,691 | 24% | 10,972 | 27% | 10,680 | 26% |

Source: ONS, Annual Population Survey 2016 (ONS, 2017b). 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.

10.7.2.15 The proportion of residents in low skill professions is overrepresented across New Anglia: 30% of working age residents compared to 26% nationally. This is particularly evident in Waveney and Great Yarmouth, where 37% and 36% of residents respectively are in low skill professions.

Employment by Sector

10.7.2.16 There are almost 672,000 employees across New Anglia LEP, 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 Edmundsbury (9%).

10.7.2.17 Analysis of jobs densities (i.e. number of jobs for every 1,000 working age residents) shows New Anglia has an average of 692 jobs compared to the national 727 jobs for every 1,000 of the Working Age Population. The key urban areas outperform the national job densities, with Norwich having 200 more jobs than Great Britain on average. Ipswich and St Edmundsbury paint a similar picture, with job densities of 821 and 930 respectively.

10.7.2.18 The lowest job densities are observed in Mid Suffolk (576) and North Norfolk (581). These local authorities each account for 5% of New Anglia’s employee numbers in Mid Suffolk and North Norfolk (see Table 10.11).

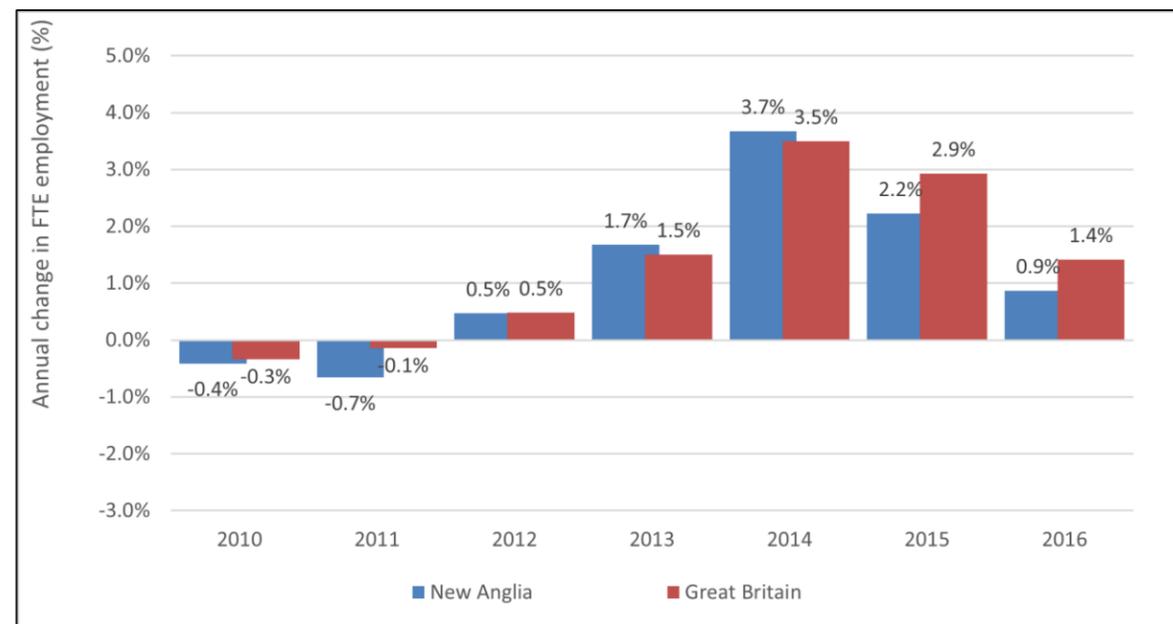
Table 10.11: Employment and employment density in New Anglia LEP, 2016.

| 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% | 605 | 25 |
| Breckland | 48 | 7% | 601 | 40 |
| Broadland | 47 | 7% | 624 | 40 |
| Forest Heath | 25 | 4% | 630 | 20 |
| Great Yarmouth | 39 | 6% | 661 | 31 |
| Ipswich | 71 | 11% | 821 | 57 |
| King’s Lynn and West Norfolk | 54 | 8% | 615 | 44 |
| Mid Suffolk | 34 | 5% | 576 | 29 |
| North Norfolk | 33 | 5% | 581 | 26 |
| Norwich | 90 | 13% | 928 | 72 |
| South Norfolk | 51 | 8% | 660 | 42 |
| St Edmundsbury | 63 | 9% | 930 | 52 |

| 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) |
|-----------------------|----------------------------------|------------------------------|---|--------------------------------|
| Suffolk Coastal | 49 | 7% | 685 | 41 |
| Waveney | 40 | 6% | 602 | 32 |
| New Anglia LEP | 672 | 100% | 692 | 551 |
| Great Britain | 29,268 | - | 727 | 24,555 |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

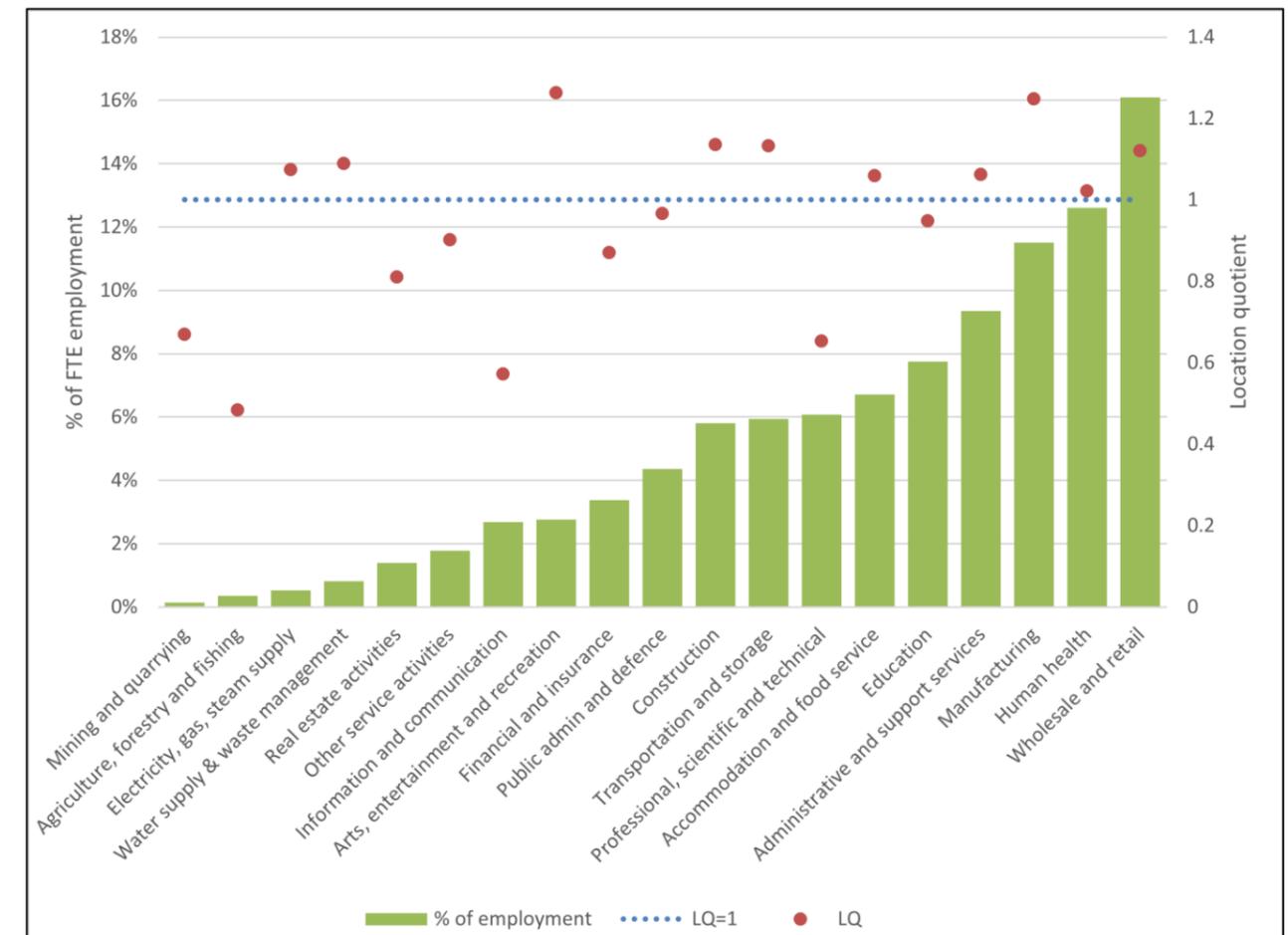
10.7.2.19 The number of employees in New Anglia equates to around 551,000 Full Time Equivalent (FTE) jobs. This level of FTE employment has followed a similar pattern of growth as Great Britain on the whole, although the overall change since 2009 has been an 8% increase in FTE jobs in New Anglia compared to 10% in Great Britain as shown in Figure 10.5.



Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c).

Figure 10.5: Employment trends (FTE), 2010-2016.

10.7.2.20 Figure 10.6 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 16% of employment numbers (or 89,000 FTE jobs), followed by health and care (13% or 69,500 FTE 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 2016 (ONS, 2017c).

Figure 10.6: Sectoral distribution of employment, New Anglia LEP 2016.

Earnings and wealth generation

10.7.2.21 Earnings in New Anglia LEP are below the national average as demonstrated by median gross annual earnings data: residents earn £2,300 less per annum, while workplace earnings are £3,000 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 (£31,100) and workplace (£30,700) earnings. Babergh has a higher than average resident earnings (£31,100) but lower workplace earning (£24,500) suggesting residents commute outside of the area to work; and
- Great Yarmouth and North Norfolk have among the lowest resident earnings in the area (£24,400), with higher workplace earnings (£26,300 and £24,500 respectively). This may suggest 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 2017.

| Area | Residence based earnings (£) | Workplace based earnings (£) |
|------------------------------|------------------------------|------------------------------|
| Babergh | 31,100 | 24,500 |
| Breckland | 24,000 | 22,500 |
| Broadland | 27,400 | * |
| Forest Heath | 26,400 | 23,900 |
| Great Yarmouth | 24,400 | 26,300 |
| Ipswich | 26,500 | 27,000 |
| King's Lynn and West Norfolk | 25,400 | 25,300 |
| Mid Suffolk | 26,000 | 25,100 |
| North Norfolk | 24,400 | 24,500 |
| Norwich | * | 26,700 |
| South Norfolk | 27,300 | 27,300 |
| St Edmundsbury | 28,700 | 25,700 |
| Suffolk Coastal | 31,100 | 30,700 |
| Waveney | 23,900 | 23,500 |

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 LEP | 26,500 | 25,800 |
| United Kingdom | 28,800 | 28,800 |

Source: ONS, Annual Survey of Hours and Earnings 2017 (ONS, 2017d). * Data is not available due to small sample sizes.

10.7.2.22 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 economic development study 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 economic development study area .

10.7.2.23 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 the New Anglia LEP, there is a gap between Suffolk and Norwich and East Norfolk and the rest of the local economic development study 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 LEP | 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

10.7.2.24 New Anglia LEP 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 and Galloper Offshore Wind Farm which are both currently under construction. As a result of these activities, there are several supply chain initiatives taking place in New Anglia, coordinated by EEEGR.

10.7.2.25 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). There are a number of companies based in the area providing services required during the development and consenting phase of offshore wind projects, such as Gardline based in Great Yarmouth with expertise in geotechnical surveys.

10.7.2.26 Great Yarmouth and Lowestoft in particular are the local economic development study 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 Dudgeon 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.

10.7.2.27 Scottish Power Renewables have chosen two ports in New Anglia for construction and operation of East Anglia ONE. This includes the port of Great Yarmouth for wind turbine pre-assembly, and the port of Lowestoft for O&M activities during the lifetime of the wind farm. This activity contributes to strengthening supply chain capabilities in the area.

10.7.2.28 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

10.7.2.29 There are several sectors in New Anglia LEP 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 standard industrial classification (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.

10.7.2.30 Manufacturing and construction are the largest in employment terms, with 44,000 and 35,000 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, 2016.

| Sector | Great Britain Employees (000s) | Great Britain % of Total | New Anglia Employees (000s) | New Anglia % of total | New Anglia LQ |
|----------------------|--------------------------------|--------------------------|-----------------------------|-----------------------|---------------|
| Manufacturing | 1,415 | 5% | 44 | 6% | 1.3 |
| Construction | 1,347 | 5% | 35 | 5% | 1.1 |
| Land based transport | 1,102 | 4% | 30 | 4% | 1.2 |
| Engineering | 954 | 3% | 23 | 3% | 1.1 |
| Energy Generation | 300 | 1% | 7 | 1% | 1.0 |
| Marine Transport | 12 | 0% | 1 | 0% | 2.5 |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000.

10.7.2.31 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 that 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); and
- 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 O&M, New Anglia 2016.

| Sector | Great Britain FTEs (000s) | New Anglia FTEs (000s) | New Anglia LQ vs Great Britain |
|---------------------------------------|---------------------------|------------------------|--------------------------------|
| Manufacturing: | | | |
| Fabricated metal products | 45 | 0.8 | 0.8 |
| Motors, generators, transformers etc. | 23 | 1.0 | 1.9 |
| Wiring and wiring devices | 13 | 0.6 | 2.2 |

| Sector | Great Britain FTEs (000s) | New Anglia FTEs (000s) | New Anglia LQ vs Great Britain |
|---|---------------------------|------------------------|--------------------------------|
| General purpose machinery | 48 | 1.2 | 1.1 |
| Construction sectors: | | | |
| Building of ships and boats | 32 | 1.0 | 1.4 |
| Other civil engineering projects | 134 | 2.6 | 0.9 |
| Transport sectors: | | | |
| Freight transport by road | 249 | 8.8 | 1.6 |
| Sea and coastal freight water transport | 5 | 0.4 | 3.5 |
| Support activities for transportation | 213 | 8.0 | 1.7 |
| Professional services: | | | |
| Management consultancies | 443 | 5.8 | 0.6 |
| Architectural, engineering consultancy | 435 | 6.8 | 0.7 |
| Other professional, scientific and technical | 121 | 2.4 | 0.9 |
| Accommodation and food services | | | |
| Accommodation | 361 | 12.1 | 1.5 |
| Food and beverage services | 1195 | 24.7 | 0.9 |
| Other sectors: | | | |
| Electric generation, transmission, distribution | 76 | 2.9 | 1.7 |
| TOTAL | 3,393 | 79.0 | n/a |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000.

10.7.2.32 New Anglia's manufacturing-related supply chain sectors show an employment base of around 3,600 FTE jobs. The manufacturing of wiring devices sub-sector is twice as concentrated than nationally (LQ=2.2). New Anglia shows specialisms in the transportation sectors (LQ of 1.6 to 3.5) 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

- 10.7.2.33 Tourism is an important sector within New Anglia LEP, underpinning substantial employment in the area and attracting wealth generation through tourism expenditure. The tourism and recreation study 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.
- 10.7.2.34 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.
- 10.7.2.35 The tourism and recreation study area is home to the 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).
- 10.7.2.36 Tourism is estimated to support 49,000 FTE jobs across New Anglia (9% of total), of which 10,000 are in the tourism and recreation study area. Tourism-related employment accounts for the largest share in North Norfolk, representing approximately 1 in 5 FTE jobs (see Table 10.16).

Table 10.16: Tourism FTE Employment, 2016.

| | Full time jobs (000s) | Part time jobs (000s) | FTE jobs (000s) | % of FTE employment |
|-----------------------|-----------------------|-----------------------|-----------------|---------------------|
| Broadland | 2 | 2 | 3 | 7% |
| North Norfolk | 3 | 4 | 5 | 18% |
| South Norfolk | 2 | 2 | 3 | 6% |
| New Anglia LEP | 30 | 39 | 49 | 9% |
| Great Britain | 1,267 | 1,482 | 2,007 | 8% |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000.

10.7.2.37 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.

10.7.2.38 Tourism data on volume and value shows there are on average 59 million visits to New Anglia per year, attracting around £2.4 billion of expenditure. Of this, around 12 million visitors come to the tourism and recreation study area annually, spending more than £404 million in the local economy. The volume and value of tourism in North Norfolk stands out as it accounts for almost 60% of visits in the tourism and recreation study 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 | 28 | 0.1 | 24 |
| North Norfolk | 6 | 132 | 0.7 | 157 |
| South Norfolk | 2 | 46 | 0.2 | 19 |
| New Anglia LEP | 55 | 1,457 | 4 | 924 |

Source: Visit Britain (2017a).

10.7.2.39 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, 2016.

| Area | Holiday | | Visiting friends and relatives | | Business visitors | |
|-----------------------|-------------------|-------------------------|--------------------------------|-------------------------|-------------------|-------------------------|
| | Visits (millions) | Expenditure (£millions) | Visits (millions) | Expenditure (£millions) | Visits (millions) | Expenditure (£millions) |
| Broadland | 0.1 | 19.7 | 0.04 | 3.3 | - | - |
| North Norfolk | 0.5 | 133.0 | 0.2 | 16.0 | 0.02 | 2.3 |
| South Norfolk | 0.1 | 10.0 | 0.1 | 7.7 | 0.01 | 0.7 |
| New Anglia LEP | 3 | 674 | 1 | 143 | 0.4 | 85 |

Source: Visit Britain (2017a).

10.7.2.40 Visit Britain also collects data on visits to tourist attractions across the county. Top 10 attractions in the tourist and recreation study 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 more than 1.1 million visitors in 2016.

Table 10.19: Top 10 Visitor Attractions in New Anglia Local Economic Development Study Area by Number of Visitors, 2016.

| Attraction | Number of visitors (2016) | District |
|--|---------------------------|---------------|
| Dinosaur Adventure | 307,000 | Broadland |
| Blickling Hall, Gardens and Park | 166,886 | Broadland |
| The Poppy Line (North Norfolk Railway) | 165,848 | North Norfolk |
| Whittingham Country Park | 140,759 | South Norfolk |
| Felbrigg Hall, Garden and Park | 110,332 | North Norfolk |
| Bressingham Steam and Gardens | 64,167 | South Norfolk |
| Wells and Walsingham Light Railway | 55,000 | North Norfolk |
| RNLI Henry Blogg Museum | 47,037 | North Norfolk |
| Wymondham Abbey | 34,362 | South Norfolk |
| Fairhaven Woodland and Water Garden | 33,604 | Broadland |

Source: Visit Britain (2017b).

10.7.2.41 Norfolk Tourism SWOT (strengths, weaknesses, opportunities and threats) research for Visit Norfolk published in 2014 provides a useful overview of the sector in the area despite being a few years old it being published in 2014 (Visit Norfolk, 2014). Norfolk's visitor economy is highly seasonal, and mainly runs from April to September. Winter months appear to be the quietest, with the time from November to February only accounting 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%).

10.7.2.42 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.

10.7.2.43 The literature does however indicate that wind farm developments (both offshore and onshore) 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). Moreover, the evidence is based on wind farms which are much closer to shore than Hornsea Three, and therefore more likely to be visible to tourists once operational.

10.7.2.44 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).

10.7.2.45 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.

10.7.2.46 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.

10.7.2.47 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.

Humber LEP Local Economic Development Study Area

10.7.2.48 Humber LEP local economic development study area 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

10.7.2.49 The Humber LEP local economic development study area has a population of over 928,000 people, of whom 570,000 are working age. The working age population across Humber LEP represents around 61% 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 2016.

| Area | Population (000s) | Working Age Population (000s) | Working Age Population as % of Total |
|-----------------------------|-------------------|-------------------------------|--------------------------------------|
| East Riding of Yorkshire | 338 | 198 | 59% |
| Kingston upon Hull, City of | 260 | 171 | 66% |
| North East Lincolnshire | 159 | 97 | 61% |
| North Lincolnshire | 171 | 104 | 61% |
| Humber LEP | 928 | 570 | 61% |
| United Kingdom | 65,648 | 41,444 | 63% |

Source: ONS Population Estimates 2016 (ONS, 2017a). Numbers are rounded to nearest 1,000.

10.7.2.50 The Humber LEP local economic development study 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

10.7.2.51 The Humber's labour market performance is comparable to national indicators: the local economic development study 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 79% and an employment rate of 76%. The other three local authorities are below the UK average.

10.7.2.52 The levels of economic inactivity follow the same spatial pattern, one percentage point above the UK average across the Humber (23%). North East Lincolnshire 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 | 156 | 79% | 151 | 76% | 41 | 21% |
| Kingston upon Hull, City of | 128 | 77% | 118 | 70% | 39 | 23% |
| North East Lincolnshire | 73 | 74% | 69 | 70% | 25 | 26% |
| North Lincolnshire | 80 | 78% | 77 | 74% | 23 | 22% |
| Humber | 438 | 77% | 414 | 73% | 128 | 23% |
| United Kingdom | 31,992 | 78% | 30,488 | 74% | 9,089 | 22% |

Source: ONS, Annual Population Survey 2017 (ONS, 2017b). Numbers are rounded to nearest 1,000.

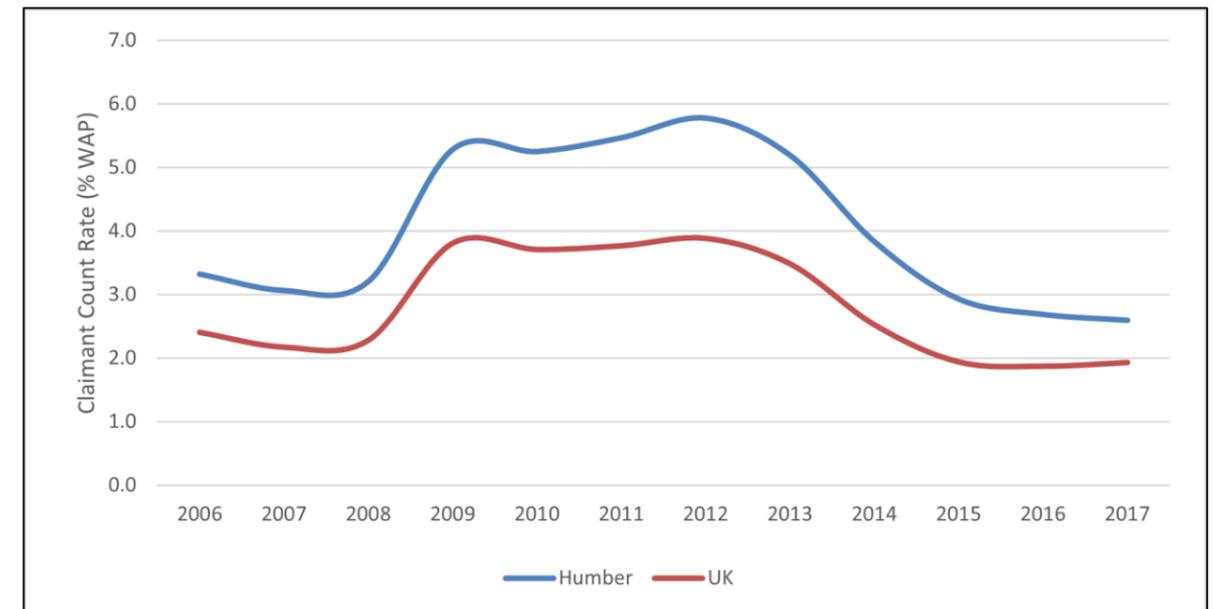
The Humber LEP exhibits a similar unemployment rates as the UK (both 5%). This suggests there is limited capacity in the labour market, although there is variation within Humber, with Kingston upon Hull having an unemployment rate of over 7%.

Table 10.22: Unemployment, Humber LEP 2017.

| Area | Number unemployed (000s) | Unemployment rate (% econ. active population) |
|-----------------------------|--------------------------|---|
| East Riding of Yorkshire | 6 | 4% |
| Kingston upon Hull, City of | 9 | 7% |
| North East Lincolnshire | 4 | 6% |
| North Lincolnshire | 4 | 5% |
| Humber LEP | 24 | 5% |
| United Kingdom | 1,504 | 5% |

Source: ONS, Annual Population Survey 2017 (ONS, 2017b). Numbers are rounded to nearest 1,000.

10.7.2.53 Data from Claimant Count is presented in Figure 10.7, 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 2017, there were on average 14,800 claimants throughout the year, representing 2.6% 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, 2017c).

Figure 10.7: Claimant count rate, 2006-2016.

10.7.2.54 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: 31% of working age residents in the Humber have higher level skills (i.e. Level 4+) compared to 38% across the UK⁵. 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 37%.

10.7.2.55 In all other skill levels, Humber LEP has a larger share than 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 | 72 | 37% | 39 | 20% | 10 | 5% | 55 | 28% | 12 | 6% |
| Kingston upon Hull, City of | 50 | 30% | 30 | 18% | 10 | 6% | 48 | 29% | 18 | 11% |
| North East Lincolnshire | 23 | 23% | 20 | 21% | 5 | 5% | 34 | 34% | 10 | 11% |
| North Lincolnshire | 30 | 29% | 19 | 18% | 5 | 5% | 35 | 33% | 7 | 7% |
| Humber LEP | 174 | 31% | 108 | 19% | 30 | 5% | 171 | 30% | 47 | 8% |
| United Kingdom | 15,549 | 38% | 6,997 | 17% | 1,288 | 3% | 10,987 | 27% | 3,381 | 8% |

Source: ONS, Annual Population Survey 2016 (ONS, 2017b). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

10.7.2.56 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).

10.7.2.57 Within Humber LEP, East Riding of Yorkshire has got the highest proportion of residents in high level occupation equivalent to 24%, equivalent to the national average. North East Lincolnshire stands out as having the least skilled occupation profile, with only a 15% of residents in high skill and a third 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 | 47 | 24% | 62 | 32% | 52 | 26% |
| Kingston upon Hull, City of | 26 | 15% | 42 | 25% | 49 | 29% |
| North East Lincolnshire | 14 | 15% | 26 | 26% | 32 | 33% |
| North Lincolnshire | 20 | 19% | 26 | 25% | 32 | 31% |
| Humber LEP | 107 | 19% | 155 | 27% | 165 | 29% |
| United Kingdom | 9,691 | 24% | 10,972 | 27% | 10,680 | 26% |

Source: ONS, Annual Population Survey 2016 (ONS, 2017b). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

Employment by Sector

10.7.2.58 There are 382,000 people employed across Humber LEP, with East Riding of Yorkshire and Kingston upon Hull accounting for two thirds of the local economic development study area's employees.⁶ This number of employees in Humber equates to around 317,000 FTE jobs. Employment density in the Humber is around 670 jobs for every 1,000 working age residents, which is below the national average by 60 jobs for every 1,000 residents.

10.7.2.59 East Riding of Yorkshire shows the lowest employment density of the local authorities in Humber despite accounting for almost a third of the local economic development study area's employment with 621 jobs per 1,000 residents. Kingston upon Hull on the other hand is closest to the national average, with 705 jobs for every 1,000 working age residents (see Table 10.25).

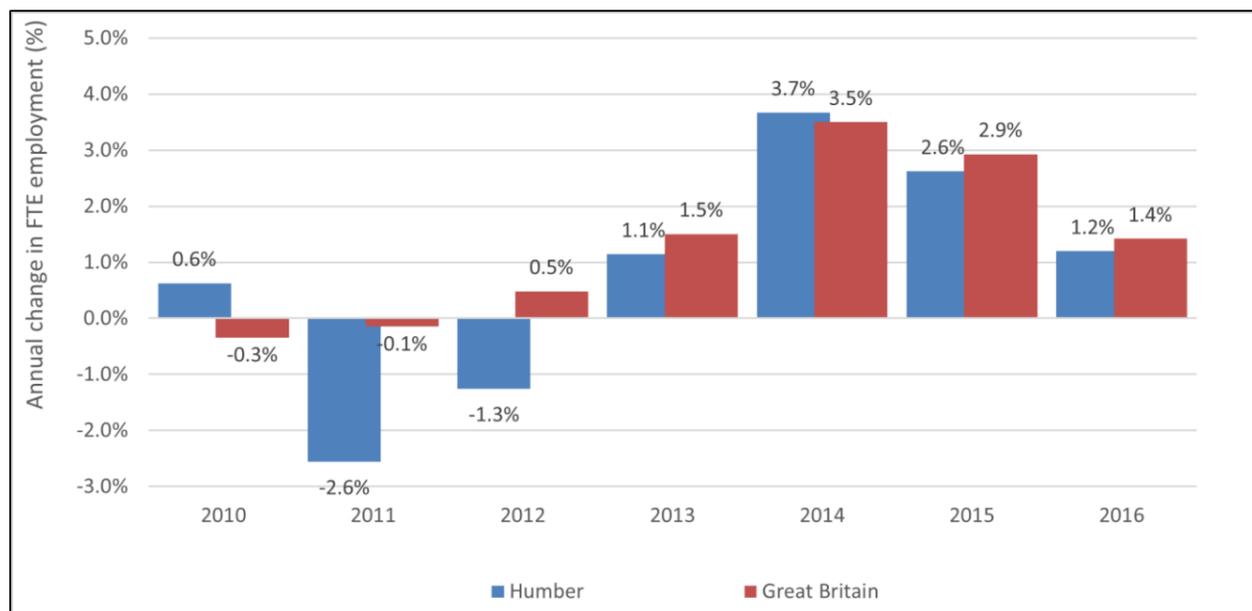
⁶ Please note: the analysis from BRES (2016) relates to the number of employees, as opposed to the total level of employment. In addition to employees, employment estimates include self-employed workers. In this instance, employee analysis is the most useful source of information as it allows for analysis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

Table 10.25: Employment and employment density in Humber LEP, 2016.

| 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 | 123 | 32% | 621 | 101 |
| Kingston upon Hull, City of | 121 | 32% | 705 | 101 |
| North East Lincolnshire | 68 | 18% | 695 | 56 |
| North Lincolnshire | 71 | 18% | 675 | 60 |
| Humber LEP | 382 | 100% | 669 | 317 |
| Great Britain | 29,268 | - | 727 | 24,555 |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000. Percentages may not sum to 100% due to rounding.

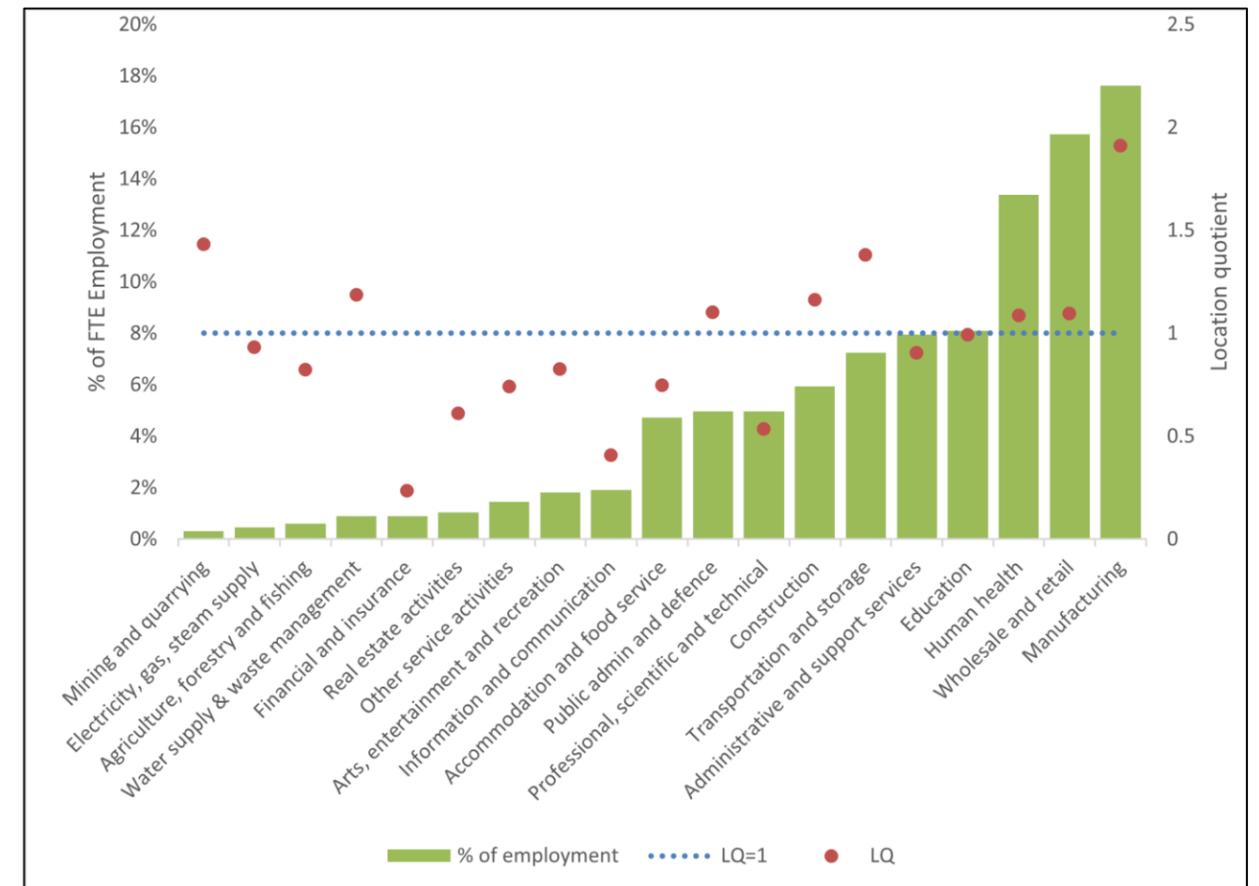
10.7.2.60 Annual changes in FTE employment are much more pronounced in the Humber compared to the national picture as shown in Figure 10.8. The Humber took longer to recover from the economic downturn, with positive growth in employment starting in 2013. Since then, the annual changes in FTE employment follow the national trend on the whole, with most recent growth rates of 1.2% in the Humber and 1.4% nationally.



Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c).

Figure 10.8: Employment trends (FTE), 2010-2016.

10.7.2.61 Analysis of employment by sector highlights the importance of manufacturing across the Humber: it is the largest sector in the area, accounting for 18% of FTE employment (see Figure 10.9). 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 FTE employment base.



Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c).

Figure 10.9: Sectoral distribution of employment, Humber LEP 2016.

Earnings and wealth generation

10.7.2.62 Data on median annual earnings for full-time employees shows Humber’s residents earn £3,200 less on average than the national indicator. There is very little difference between resident and workplace earnings in the Humber: residents earn £100 more on average than those who work in Humber.⁷

10.7.2.63 The difference between resident and workplace earnings is more pronounced within the local authorities. North Lincolnshire shows the highest workplace wages out of the local authorities in Humber, although still below the national average (workplace earnings of £27,500 are below the average earnings for the UK of £28,800).

Table 10.26: Resident and workplace median earnings for full-time employees (gross annual), Humber LEP 2017.

| Area | Residence based earnings (£) | Workplace based earnings (£) |
|-----------------------------|------------------------------|------------------------------|
| East Riding of Yorkshire | 27,500 | 25,700 |
| Kingston upon Hull, City of | 23,100 | 24,900 |
| North East Lincolnshire | 23,400 | 22,200 |
| North Lincolnshire | 27,300 | 27,500 |
| Humber LEP | 25,600 | 25,400 |
| United Kingdom | 28,800 | 28,800 |

Source: ONS, Annual Survey of Hours and Earnings 2017 (ONS, 2017d)

10.7.2.64 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.

10.7.2.65 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.

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 10.27: 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 LEP | 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

10.7.2.66 The Humber LEP’s local economic development study 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).

10.7.2.67 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.

10.7.2.68 Orsted has an established presence in Humber LEP. Its operational offshore wind hub in Grimsby was established to support Westernmost Rough, Race Bank and Hornsea Project One offshore wind farms. Orsted has also indicated that it is in advanced stages of developing the concept of an “East Coast Hub” as an extension of its offshore wind operations centre at the Royal Docks in Grimsby which will serve Westernmost Rough, Lincs, Race Bank, Hornsea Project One and Project Two offshore wind farms.

Key supply chain sectors in Humber

10.7.2.69 Given the history of offshore wind supply chains in the Humber LEP 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.

10.7.2.70 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, 2016.

| Sector | Great Britain Employment (000s) | Great Britain % of total | Humber Employment (000s) | % of total in Humber | Humber LQ |
|----------------------|---------------------------------|--------------------------|--------------------------|----------------------|-----------|
| Manufacturing | 1,415 | 5% | 41 | 11% | 2.2 |
| Construction | 1,347 | 5% | 20 | 5% | 1.1 |
| Land based transport | 1,102 | 4% | 24 | 6% | 1.6 |
| Engineering | 954 | 3% | 18 | 5% | 1.4 |
| Energy Generation | 300 | 1% | 5 | 1% | 1.2 |
| Marine Transport | 12 | 0% | 0.2 | 0% | 1.2 |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000.

10.7.2.71 A more detailed breakdown in sectors with supply chain opportunities is provided in

10.7.2.72 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.

10.7.2.73 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 O&M, Humber 2016.

| Sector | Great Britain FTEs (000s) | Humber FTEs (000s) | Humber LQ vs Great Britain |
|---------------------------------------|---------------------------|--------------------|----------------------------|
| Manufacturing: | | | |
| Fabricated metal products | 45 | 0.7 | 1.2 |
| Motors, generators, transformers etc. | 23 | 0.1 | 0.2 |
| Wiring and wiring devices | 13 | 0.2 | 1.3 |
| General purpose machinery | 48 | 0.2 | 0.3 |

| Sector | Great Britain FTEs (000s) | Humber FTEs (000s) | Humber LQ vs Great Britain |
|---|---------------------------|--------------------|----------------------------|
| Construction sectors: | | | |
| Building of ships and boats | 32 | 0.0 | 0.1 |
| Other civil engineering projects | 134 | 2.2 | 1.3 |
| Transport sectors: | | | |
| Freight transport by road | 249 | 6.1 | 1.9 |
| Sea and coastal freight water transport | 5 | 0.1 | 0.7 |
| Support activities for transportation | 213 | 6.4 | 2.3 |
| Professional services: | | | |
| Management consultancies | 443 | 2.1 | 0.4 |
| Architectural, engineering consultancy | 435 | 4.7 | 0.8 |
| Other professional, scientific and technical | 121 | 1.6 | 1.0 |
| Accommodation and food services: | | | |
| Accommodation | 361 | 3 | 0.7 |
| Food and beverage services | 1195 | 11 | 0.7 |
| Other sectors: | | | |
| Electric generation, transmission, distribution | 76 | 1.0 | 1.0 |
| TOTAL | 3,393 | 40.0 | n/a |

Source: ONS, Business Register and Employment Survey 2016 (ONS, 2017c). Numbers are rounded to nearest 1,000.

10.7.3 Future baseline scenario

10.7.3.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires that "an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge" is included within the Environmental Statement.

10.7.3.2 It is not common practice for socio-economic impact assessments to provide a future baseline scenario to inform impacts of development activity on socio-economic receptors. This is largely because of the significant uncertainties which exist in projecting future economic conditions in local areas. There are various commercially available models which provide quantitative estimates of future employment and labour market conditions. These forecasts are predominantly based on data on past trends which is used, in conjunction with other factors, to estimate potential employment and sector growth rates nationally. These national projections are then apportioned to local areas, often using concentrations of sectoral employment locally as the basis for the local estimates. This can make these models challenging to interpret at a local level and can limit the usefulness of economic forecasting models for the assessment of impacts on socio-economic receptors.

10.7.4 Data limitations

Baseline Indicators

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.

10.7.4.3 There are data challenges with disaggregating GVA data by sector in order to measure the impact of Hornsea Three in the context of the renewable energy sector. The data is available by broad SIC code level, which does not lend itself to defining a renewable energy sector especially below national geographical level. This means the assessment of GVA impacts is undertaken against a whole economy baseline. Quantitative definitions of magnitude are adjusted accordingly for GVA receptors to reflect the breadth of the measure.

Assessment Data Limitations

10.7.4.4 The chapter considers a UK study area to enable the national significance of socio-economic effects to be assessed. It should be noted that the effects of Hornsea Three in the context of the UK study area appear low, however, these have been included in the assessment to demonstrate the absolute scale of potential effects for the UK. Where data is not available at a UK level (namely the ONS Business Register and Employment Survey), Great Britain is used as an alternative measure.

10.7.4.5 There are several areas of uncertainty in undertaking the assessment of socio-economic assessment effects are around costs, the construction and O&M port to be used, and geographic sourcing of goods and services. As the location of ports and supply chain contracts will be determined through a procurement process at a later stage (post consent), it is not possible to confidently predict the level of expenditure and where it is likely to take place. It is also difficult to measure with certainty the capacity within the supply chain businesses to compete for contracts. The uncertainty has been dealt with using the scenario-based approach to assessment described previously to illustrate the likely range of potential impacts.

10.7.4.6 There are also significant data limitations in undertaking the CEA.

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);
- O&M; and
- Decommissioning.

10.8.1.3 The quantitative assessment presented in this chapter focuses 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 is provided on the broad types and potential scale of these socio-economic effects.

- 10.8.1.4 The assessment considers the effects associated with both onshore and offshore infrastructure. For offshore infrastructure (e.g. the turbines), the assessment considers 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 are 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; chapter 7: Traffic and Transport), 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 presented in this chapter focuses on direct and indirect impacts on receptors which can be attributed to Hornsea Three via a clear impact-receptor pathway. Although there may be the potential for Hornsea Three to contribute to impacts on other receptors (such as health and deprivation and wider community measures), these can be affected by many other factors.
- 10.8.1.6 The receptors that will be considered in the assessment of the significance of the effects and the relevant study areas are highlighted in Table 10.30.

10.8.2 Impacts scoped out of the assessment

- 10.8.2.1 On the basis of the baseline environment and the project description outlined in volume 1, chapter 3: Project Description, a number of impacts are proposed to be scoped out of the assessment for socio-economics. These impacts are outlined, together with a justification for scoping them out, in Table 10.31.

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 economic development study 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 design scenario. |
| The construction of Hornsea Three may have an impact on the amount of GVA supported by construction activity: UK and local economic development study areas. | | 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. |
| The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents: local economic development study area. | | Three construction scenarios have been assessed. The low impact scenario could be thought of as a maximum design scenario insofar as the local and UK based benefits are at their lowest. |
| The construction of Hornsea Three may have an impact on the demand for housing, accommodation and local services: local economic development study 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 economic development study area. This is not affected by detailed aspects of the scheme design. The maximum design scenario for this receptor would arise if all employment generated during the construction phase is filled by people from outside of the local economic development study 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 economic development study 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 and recreation study 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, and chapter 8: Noise and Vibration. As a result, the assessment reflects the maximum design scenarios in these chapters. |
| The construction of Hornsea Three may have an impact on local tourism and recreational resources, including public rights of way (PRoW): tourism and recreation study area. | Reflects maximum design scenarios in related chapters. | |
| Operation and Maintenance phase | | |
| The O&M of Hornsea Three may have an impact on employment in O&M and in the supply chain: UK and local economic development study 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 design scenario. |
| The O&M of Hornsea Three may have an impact on the amount of GVA (£m) supported by O&M activity: UK and local economic development study areas. | | 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 access to O&M related employment amongst local residents: local economic development study areas. | | |

| Potential impact | Maximum design scenario | Justification |
|---|--|---|
| The O&M of Hornsea Three may have an impact on demand for housing, accommodation and local services: local economic development study 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 economic development study area. This is not affected by detailed aspects of the scheme design. The maximum design scenario for this receptor would arise if all employment generated during the O&M phase is filled by people from outside of the local economic development study 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 economic development study 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 and recreation study 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). As a result, the assessment reflects the maximum design scenarios of these chapters. |
| The O&M of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW: tourism and recreation study area. | Reflects maximum design scenarios in related chapters. | |
| Decommissioning phase | | |
| The decommissioning of Hornsea Three may have an impact on decommissioning related employment: UK and local economic development study 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 design 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 economic development study areas. | | |
| The decommissioning of Hornsea Three may have an impact on access to decommissioning related employment amongst local residents: local economic development study areas. | | |
| The decommissioning of Hornsea Three may have an impact on demand for housing, accommodation and local services: local economic development study 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 economic development study area. This is not affected by detailed aspects of the scheme design. The maximum design scenario for this receptor would arise if all employment generated during the decommissioning phase is filled by people from outside of the local economic development study 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 economic development study 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 and recreation study 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 and recreation study area. | Reflects maximum design scenarios in related chapters. | |

Table 10.31: Impacts scoped out of the assessment for socio-economics.

| Potential impact | Justification |
|--|---|
| Operation and Maintenance phase | |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on employment in O&M and in the supply chain: UK and local economic development study areas. | There is no routine maintenance requirement for the onshore cable corridor. |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on the amount of GVA (£m) supported by O&M activity: UK and local economic development study areas. | |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on access to O&M related employment amongst local residents: local economic development study areas. | |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on demand for housing, accommodation and local services: local economic development study areas. | There is no routine maintenance requirement for the onshore cable corridor. |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on the performance of the renewable energy sector: local economic development study areas. | |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on offshore and coastal tourism and recreation activity and associated economic value: tourism and recreation study area. | |
| The O&M of Hornsea Three (onshore cable corridor) may have an impact on local tourism and recreational resources, including PRoW: tourism and recreation study area. | |

10.9 Impact assessment methodology

10.9.1.1 The socio-economic assessment has followed the methodology set out in volume 1, chapter 5: Environmental Impact Assessment Methodology. Specific to the socio-economic topic, the chapter follows the guidance set The Green Book (HM Treasury, 2003).

10.9.1.2 There is no legislative framework for socio-economic assessment in EIA.

10.9.1.3 Effects in the UK economic development study area will only be assessed in this chapter 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 economic development study areas but not for the UK. In practice, this means that the UK economic development study area is only used for receptors relating to employment and GVA created during the construction, O&M and decommissioning phases.

10.9.2 Impact assessment criteria

10.9.2.1 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 Design Manual for Roads and Bridges methodology, which is described in further detail in volume 1, chapter 5: Environmental Impact Assessment Methodology.

10.9.2.2 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's Green Book (2003). The key assumptions underpinning the methodology are outlined in Table 10.37 and section 10.10.2. The socio-economic impact magnitude will then be determined by consideration of the predicted deviation from baseline conditions.

10.9.2.3 The criteria for defining sensitivity in this chapter are outlined in Table 10.32.

Table 10.32: 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 socio-economic challenges, underperformance and vulnerability for the receptor in the study area. |

| Sensitivity | Definition used in this chapter |
|----------------|---|
| High | The receptor is identified as a policy priority (as a result of economic potential and/or need). There is evidence of major socio-economic challenges or underperformance and vulnerability for the receptor in the study 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 socio-economic challenges or underperformance and vulnerability for the receptor in the study 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 study 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 study area. |

10.9.2.4 The criteria for defining magnitude in this chapter are outlined in Table 10.33.

10.9.2.5 Due to the nature of socio-economic impacts, it is not always possible to define magnitude in a wholly quantitative way. The assessment of magnitude therefore requires an element of professional judgement to conclude the assessment considering the quantitative and qualitative elements which are taken into account.

Table 10.33: 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. |

10.9.2.6 The quantitative criteria used to assess the magnitude of change from baseline conditions are presented in Table 10.34.

Table 10.34: Criteria for assessment of magnitude of an impact.

| | No change | Negligible | Minor | Moderate | Major |
|---------------------------|-----------|------------|------------|-----------|-------|
| Employment: | | | | | |
| Direct = relevant sectors | 0% | Up to 0.5% | 0.5 - 1% | 1 - 2% | 2% + |
| Indirect = whole economy | | | | | |
| GVA: | | | | | |
| Whole economy GVA | 0% | Up to 0.1% | 0.1 - 0.5% | 0.5 to 1% | 1% + |

10.9.2.7 The assessment of the magnitude of impacts is 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.

10.9.2.8 For each of the three phases (construction, O&M and decommissioning) Hornsea Three has the 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 is outlined for each of the development scenarios.

10.9.2.9 The impacts on employment and GVA expressed in annual terms provide the most appropriate basis for assessing the magnitude of impact on baseline conditions. The magnitude of impact on employment and GVA receptors is therefore be provided in person years of employment and aggregate 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 economic development study areas.

10.9.2.10 The annualised employment and GVA represents the maximum intensity of construction activity if components were built simultaneously or overlapping across multiple components, which provides the most reasonable estimate of employment and GVA numbers during construction. It is important to note, however, that it does not reflect the exact construction timescales, as this will depend on the exact phasing of activities.

10.9.2.11 The assessment of the magnitude of impact on the GVA receptor is measured as a change against baseline conditions against the total level of GVA in the UK and local economic development study areas.

10.9.2.12 The magnitude of impact on the employment receptor is 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 O&M, 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).

10.9.2.13 The significance of the effect upon socio-economics is 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 10.35. Where a range of significance of effect is presented in Table 10.35, the final assessment for each effect will be based upon expert judgement.

10.9.2.14 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 10.35: Matrix used for the assessment of the significance of the effect.

| | | Magnitude of impact | | | | |
|-------------------------|------------|---------------------|---------------------|---------------------|----------------------|----------------------|
| | | No change | Negligible | Minor | Moderate | Major |
| Sensitivity of receptor | 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

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

10.9.2.16 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 economic development study area as a result of the estimated direct spend.

10.9.2.17 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 economic development study 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

10.9.2.18 Indirect impacts will capture the FTE jobs and GVA generated in the local economic development study areas in the chain of suppliers of goods and services to the direct activities.

10.9.2.19 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.

10.9.2.20 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).

10.9.2.21 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

10.9.2.22 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.

10.9.2.23 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.

10.9.2.24 In order to adopt a cautious approach to the socio-economic impact assessment, the induced economic effects are not quantitatively assessed here. However, it should be noted that these impacts are a beneficial consequence of Hornsea Three.

Wider economic impacts

10.9.2.25 The assessment of economic impacts arising through Hornsea Three also encompasses 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.

10.9.2.26 In line with official guidance (HM Treasury's, The Green Book (2003)), the temporary job creation arising during the construction period will be assessed and presented in terms of 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.

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

10.9.2.28 The overall cost of various elements of Hornsea Three's construction and O&M has been estimated using a literature review of public benchmark cost information. The two main sources of evidence were published estimates from the Crown Estate (Crown Estate, 2012). Given the benchmarks are now out of date, the cost figures have been adjusted using the recent evidence on cost reduction for offshore wind published by the Catapult for Offshore Renewable Energy in 2015/16 (Offshore Wind Programme Board, 2016). The results have been reconciled to provide an estimate for the total cost of Hornsea Three.

Impact scenarios

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

- The location of the main tier one (i.e. those contracted directly to the Applicant) and tier two suppliers (i.e. 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 economic development study area;
- The likelihood of ports in the economic development study area 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.

10.9.2.30 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.

10.9.2.31 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 September 2017. The study collected data from eight offshore wind farms which reached final investment decision between 2010 and 2015, assessing the development, construction and manufacture, O&M stages, and their total expenditure. The UK content for these projects averaged 48% overall, with the highest achieved content of 53% (see Table 10.36).

Table 10.36: UK Content of offshore wind farm total expenditure.

| Expenditure Type | UK content | | |
|--------------------------|------------|------------|------------------|
| | Lower | Upper | Weighted average |
| Development expenditure | 27% | 92% | 73% |
| Capital expenditure | 22% | 38% | 29% |
| O&M | 52% | 89% | 75% |
| Total expenditure | 44% | 53% | 48% |

Source: BVG Associates (2017).

10.9.2.32 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 economic development study 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 has been taken to illustrate the potential range of impacts which might be captured in the UK and each of the Hornsea Three local economic development study areas.

10.9.2.33 This approach is in line with current policy and best practice in both the scope (Marine Management Organisation, 2011 and Renewable UK, 2011) and assessment method (Department of the Environment, Fisheries and Rural Affairs, 2010). The scenario analysis has been developed to assess the socio-economic effects of the potential activities that could take place at ports within the local economic development study 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 UK and local economic development study areas.

10.9.2.34 The sourcing assumptions for each scenario have been 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 economic development study area, 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 economic development study areas which has focused on identifying the sectors in which the local economic development study area has particular strengths; and
- Discussions with the Applicant concerning the procurement process and likelihood that UK suppliers might capture part of the supply chains.

10.9.2.35 A recent paper on the Strategic Review of East Coast Staging and Construction Facilities (BVG Associates, 2016) has been drawn on to determine the likely capacity and capability of the ports in New Anglia and Humber local economic development study area. The report suggests that within the New Anglia and Humber local economic development study areas, there are several ports with an appropriate level of capability to be used as part of the construction phase.

10.9.2.36 As the likelihood and nature of port use for construction and O&M is amongst the key factors which influence potential socio-economic impacts, the impact scenarios have been developed to reflect the capacity and capability of ports in New Anglia and Humber local economic development study area.

10.9.2.37 It is important to note that there is potential for ports in each of the local economic development study areas to play a role in the construction and operation of Hornsea Three. For the construction phase at least, it is feasible that ports in both Humber LEP and New Anglia LEP could be used. In addition to use of local ports, the scenarios also reflect the level and nature of local supply chain sourcing in each of the economic development study areas. Low, medium and high scenarios have been developed for Humber LEP and a low and medium scenario for New Anglia LEP (reflecting the capabilities that exist in the supply chains in these areas). The key assumptions for each of the scenarios are summarised in Table 10.37.

10.9.2.38 The high O&M scenarios for Humber LEP and New Anglia LEP are mutually exclusive, as it is assumed that one local economic development study area is benefitting from a substantial share of supply chain activities, and therefore could only occur in one of the local economic development study 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 economic development study areas being used to supply different activities. For this reason, high and low scenarios are developed for the O&M phase to emphasise this range, and the potential combination of impacts in both Humber and New Anglia local economic development study areas. The ranges of potential impact which could be secured by each area during O&M is assumed to be comparable.

10.9.2.39 The assessment illustrates the scale of impacts which could occur in the local economic development study area, without concluding which impacts would occur in which areas. The outline scenarios are summarised in Table 10.37.

Table 10.37: Hornsea Three Scenario Design and Key Assumptions.

| Scenario | UK | Local economic development study area: Humber LEP | Local economic development study area Study Area: New Anglia LEP |
|-----------------------------------|---|---|--|
| Low Impact Construction Scenario | <p>No UK Ports Used</p> <p>Main construction ports outside of the UK and turbine and associated supply chain all overseas.</p> <p>Very limited supply chain opportunities for UK firms.</p> <p>Modest amount of UK based sourcing for balance of plant activities (largely cables, substation components and turbine foundations).</p> | <p>No Humber Ports Used</p> <p>Minimal local involvement in elements of the UK based construction supply chain.</p> | <p>No New Anglia Ports Used</p> <p>Minimal local involvement in elements of the UK based construction supply chain.</p> |
| Medium Construction Scenario | <p>UK Ports Used for Laydown</p> <p>Some use of UK ports for laydown for some components.</p> <p>Turbine and tower manufacture remains outside of UK so port use is still modest.</p> | <p>Some use of Humber Ports</p> <p>Concentration of activity in the vicinity of the port leading to greater involvement of local suppliers in installation and commissioning activities.</p> <p>Some use of local vessels.</p> <p>Turbine blades sourced from within the Humber local economic development study area, leading to associated supply chain impacts.</p> | <p>Some use of East Anglia Ports</p> <p>Concentration of activity in vicinity of the port leading to greater involvement of local suppliers in installation and commissioning activities.</p> <p>Some use of local vessels.</p> |
| High Impact Construction Scenario | <p>UK Ports Used and Major Components Sourced from UK</p> <p>More extensive port use linked to greater sourcing of components from within UK.</p> <p>UK involvement in turbine and tower manufacture and associated supply chain impact drives greater level of impact.</p> | <p>Extensive Use of Humber Ports</p> <p>Ports in Humberside used extensively.</p> <p>Turbine blades sourced from within the Humber local economic development study area, leading to associated supply chain impacts.</p> <p>Greater involvement of local suppliers in installation and commissioning.</p> <p>Some use of local vessels.</p> | <p>Not applicable due to lower likelihood of supplying turbine components.</p> <p>As the scenarios for Humber assume 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.</p> <p>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.</p> |

| Scenario | UK | Local economic development study area: Humber LEP | Local economic development study area Study Area: New Anglia LEP |
|--------------------------|---|---|---|
| Low Impact O&M Scenario | <p>Not applicable due to low likelihood of overseas O&M base</p> <p>Based on Ørsted's track record in the UK and wider industry experience, it is unlikely that Hornsea Three would be operated and maintained from an overseas base.</p> | <p>No Humber Based O&M Base</p> <p>None/very few O&M technicians for offshore infrastructure from within the Local Impact Area.</p> <p>Very minimal local supply chain involvement.</p> | <p>No New Anglia Based O&M Base</p> <p>Activity limited to those associated with the Hornsea Three onshore cable corridor and local activities to service and maintain onshore sub-stations.</p> <p>None/very few O&M technicians for offshore infrastructure from within the Local Impact Area.</p> <p>Very minimal local supply chain involvement.</p> |
| High Impact O&M Scenario | <p>UK Based O&M Base</p> <p>O&M of Hornsea Three takes place from a UK base.</p> <p>Associated supply chain is predominantly UK based (in areas where capacity exists).</p> <p>Technicians and other employees predominantly UK based.</p> | <p>O&M Base in Humberside</p> <p>All of the operations services from a base in Humberside.</p> <p>Significant local supply chain involvement.</p> <p>Higher level of technicians from within economic development study area employed.</p> | <p>O&M Base in New Anglia</p> <p>All of the operations services from a base in New Anglia.</p> <p>Significant local supply chain involvement.</p> <p>Higher level of technicians from within economic development study area employed.</p> |

Note: High impact O&M scenario for Humber LEP and New Anglia LEP are mutually exclusive.

10.9.2.40 Ørsted is committed to developing and deepening the 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.

10.9.2.41 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 Ørsted's business plans and approach. For example, in March 2017, Ørsted Hornsea Three participated in EEEGR SNS 2017 conference to raise awareness of Hornsea Three the project within local business networks. Ørsted has also held a number of local supply chain events for its recent projects including for Burbo Bank 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 Two (pending a positive financial investment decision) and Hornsea Three at the appropriate times.

10.9.2.42 Building relationships with capable, competitive and innovative suppliers is essential to delivering new projects successfully. Hornsea Three is working closely with the relevant LEPs and business networks and other relevant organisations in the local economic development study areas to understand what can be supplied locally and maximise any opportunities.

10.9.2.43 The assessment aims to reflect the latest developments in the offshore wind industry, and therefore the following steps have been taken in the socio-economic assessment:

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

10.10 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 increase the potential for beneficial impacts on socio-economics and reduce the potential for adverse impacts on tourism (see Table 10.38). As there is a commitment to implementing these measures, they are considered inherently part of the design of Hornsea Three and have therefore been considered in the assessment presented in section 10.11 (i.e. the determination of magnitude and therefore significance assumes 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 economic development study area.

Table 10.38: 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 economic development study area |
| Identify opportunities for local people to access employment associated with Hornsea Three. | |

10.10.1.3 Developing people with the right skills to deliver the UK's offshore wind ambitions is a key priority for Ørsted. In the UK, Ørsted's activities include delivering a programme of skills initiatives at local and regional levels across the UK such as including a partnership with Teach First partnership, supporting/collaborating with University Technical Colleges, establishing an apprenticeship scheme and, ring-fencing funds for skills. Science, Technology, Engineering, and Math initiatives through Ørsted's voluntary Community Benefit Funds.

10.10.1.4 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 communities' residents to access employment opportunities associated with the construction and operation of the wind farm.

10.10.1.5 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.

10.10.1.6 Should consent for Hornsea Three be granted, Hornsea Three would assess, in partnership with the LEPs, 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.

10.10.1.7 Based on the nature and scale of local economic opportunities, the project will explore 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 scenarios

10.10.2.1 The scenarios modelled for the construction of Hornsea Three illustrate the impact that the various sources of uncertainty in the assessment (highlighted in paragraph 10.9.2.29) would have on the scale and type of impacts which occur in the UK and Hornsea Three local economic development study areas.

10.10.2.2 Unless stated otherwise, figures provided in this section relate to spend in the entire construction period rather than annually.

10.10.2.3 To reflect the full extent of potential economic impact associated with Hornsea Three, pre-construction phase (Design and Development) has been included within the sourcing scenarios. This makes up a relatively small component of overall spend and includes activities associated with the development of the scheme such as sea bed surveys, engineering and design studies, and coastal process surveys.

10.10.2.4 The scenarios are outlined in turn for each spatial study area.

UK Economic Development Study Area Construction Scenarios

10.10.2.5 There are three construction scenarios for the UK economic development study area, summarised in Table 10.39.

Table 10.39: Sourcing assumptions under the construction scenarios for the UK Economic Development Study Area (Development and Capital Expenditure).

| Phase | Estimated Value (£m) | Low: % of Total Value Sourced from UK | Medium: % of Total Value Sourced from UK | High: % of Total Value Sourced from UK |
|-----------------------------------|----------------------|--|---|---|
| 1. Design and development | 288 | 80% | 80% | 92% |
| 2. Wind turbine manufacture | 3,032 | 0% | 20% | 20% |
| 3. Balance of plant | 1,894 | 14% | 28% | 56% |
| 4. Installation and commissioning | 1,050 | 11% | 35% | 70% |
| Total | 6,264 | 10% | 28% | 43% |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

UK Low Impact Construction Scenario

- 10.10.2.6 Under the low impact scenario, it is assumed that the main construction ports will be outside of the UK. As a result, direct expenditure and supply chain opportunities for firms within the UK and the Local Study Areas during the manufacture and installation of the turbines will be limited. As construction ports would be outside of the UK, it is assumed that all aspects of turbine manufacturing and the associated supply chain would also be located overseas. There would be some UK-based sourcing of materials for balance of plant activities (i.e. all components of the wind farm with the exception of the turbine). This element is largely focused on manufacture of cables and substation components and sourcing of materials for the turbine foundations.
- 10.10.2.7 Under the low impact scenario, UK businesses would be able to capture 10% of total construction expenditure, equivalent to approximately £600 million.

UK Medium Impact Construction Scenario

- 10.10.2.8 The medium impact construction scenario assumes that UK ports could be used for parts of the construction. The scenario assumes that much of the wind turbine manufacturing activity would remain outside of the UK, given the highly specialist nature of much of this activity. However, it takes account of the blades manufacturing facility in the Humber, assuming that sourcing the blade components from within the Humber LEP leads to a higher share of sourcing.
- 10.10.2.9 A higher proportion of the balance of plant supply chain would be within the UK under the medium impact scenario. Parts of cable manufacture, and structural elements of substations would be the main parts of the balance of plant supply chain that UK firms would enter.

10.10.2.10 The overall share of construction spend within the UK as a whole would also rise to 28% under this construction scenario, totalling approximately £1.7 billion. This increase would be largely related to the procurement of blades for the turbine from within the UK, but also due to greater involvement of UK firms in the works related to balance of plant activities and some use of UK ports during the construction phase.

UK High Impact Construction Scenario

- 10.10.2.11 The high impact construction scenario assumes that UK ports are used extensively throughout the construction phase. The high impact scenario takes into consideration the recent developments in the supply chain capabilities of UK businesses and evidence on UK content. Furthermore, it considers the latest strategic investments which have taken place to develop blade manufacturing capabilities in the UK, strengthening the capability of the supply chain and leading to an increased level of sourcing from UK businesses.
- 10.10.2.12 The high impact scenario takes account of improved cable manufacturing and installation capabilities of the UK supply chains, vessels and engineering capabilities. It also takes into account the evidence of diversification of businesses which have been active in the oil and gas sector and are now entering the offshore wind market (BVG Associates, 2017).
- 10.10.2.13 A much higher proportion of cables are manufactured within the UK under this scenario. In addition, throughout the installation and commissioning activity, a much greater proportion of vessels are sourced from the UK.
- 10.10.2.14 Under the high impact construction scenario, UK companies would capture 43% of total construction expenditure (approximately £2.7 billion).

Local Economic Development Study Area Construction Scenarios: New Anglia LEP

10.10.2.15 There are two construction scenarios for New Anglia LEP local economic development study area, summarised in Table 10.40.

Table 10.40: Sourcing assumptions under the construction scenarios for New Anglia LEP Local Economic Development Study Area.

| Phase | Estimated Value (£m) | Low: % of Total Value Sourced from New Anglia LEP | Medium: % of Total Value Sourced from New Anglia LEP |
|-----------------------------|----------------------|--|---|
| 1. Design and development | 288 | 10% | 10% |
| 2. Wind turbine manufacture | 3,032 | 0 | 0 |

| Phase | Estimated Value (£m) | Low: % of Total Value Sourced from New Anglia LEP | Medium: % of Total Value Sourced from New Anglia LEP |
|-----------------------------------|----------------------|--|--|
| 3. Balance of plant | 1,894 | 0 | 5 |
| 4. Installation and commissioning | 1,050 | 1 | 23 |
| Total | 6,264 | 1% | 6% |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

New Anglia Low Impact Construction Scenario

10.10.2.16 Under the low impact scenario, it is assumed that the main construction ports will be outside of the UK, and so supply chain opportunities for firms within the local economic development study area during the manufacture and installation of the turbines will be limited. Local companies could get a modest share of the expenditure on development and consent activities. These include ground investigations, topographical, ground penetrating radar, ecological and archaeological surveys, soil surveys, utility and private supplies surveys. The scenario also assumes that some activities associated with foundation installations can be undertaken by local suppliers.

10.10.2.17 Overall, the low scenario for New Anglia assumes up to 1% of expenditure could be captured, equivalent to approximately £42 million. The low scenarios in Humber and New Anglia are not mutually exclusive, and are intended to illustrate the scale of impact which could occur in each or one of the areas under the maximum adverse scenario.

New Anglia Medium Impact Construction Scenario

10.10.2.18 The medium construction scenario for New Anglia LEP assumes that the ports within New Anglia could be used during construction for some of the activities (please note: this does not exclude the possibility of Humber ports also being used for construction). This would enable locally-based suppliers to enter the construction supply chain more easily (particularly as part of installation and commissioning activities).

10.10.2.19 The scenario assumes that much of the wind turbine manufacturing activity would remain outside of the New Anglia LEP and the UK, given the limited capabilities to deliver these activities currently beyond blade manufacturing.

10.10.2.20 Local firms would be able to benefit from a larger proportion of the balance of plant supply chain expenditure and the location of ports in the New Anglia local economic development study area. The location of the onshore cable route in New Anglia means there is potential for local firms to supply the onshore construction-related services.

10.10.2.21 Given that ports within New Anglia would be used under this scenario, it is assumed that local vessels would be used more (but not exclusively) for foundation installation, export and array cable laying. The location of Seajacks in Great Yarmouth would be able to accommodate some of this activity, as well as some of the turbine installation vessel activity. This is the main difference between the medium construction scenarios in Humber and New Anglia, as New Anglia has specialised suppliers located in the area that enable it to capture a larger share of the installation and commissioning activities.

10.10.2.22 The overall share of construction spend within New Anglia would rise to 6% under this construction scenario, totalling approximately £378 million.

Local Economic Development Study Area Construction Scenarios: Humber LEP

10.10.2.23 There are three construction scenarios for Humber LEP local economic development study area, summarised Table 10.41.

Table 10.41: Sourcing assumptions under the construction scenarios for Humber LEP Local Economic Development Study Area.

| Phase | Estimated Value (£m) | Low: % of Total Value Sourced from Humber LEP | Medium: % of Total Value Sourced from Humber LEP | High: % of Total Value Sourced from Humber LEP |
|-----------------------------------|----------------------|--|---|---|
| 1. Design and development | 288 | 10% | 10% | 20% |
| 2. Wind turbine manufacture | 3,032 | 0% | 20% | 20% |
| 3. Balance of plant | 1,894 | 0% | 5% | 10% |
| 4. Installation and commissioning | 1,050 | 1% | 10% | 26% |
| Total | 6,264 | 1% | 13% | 18% |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

Humber Low Impact Construction Scenario

10.10.2.24 As outlined earlier, under the low impact scenario it is assumed that the main construction ports will be outside of the UK, and so supply chain opportunities for firms within the local economic development study area will be limited. Local companies could get a modest share of the expenditure on development and consent activities, and activities associated with non-specialised civils and installation works.

10.10.2.25 As a result, under the low scenario 1% of expenditure could be spent in Humber LEP, equivalent to approximately £42 million.

Humber Medium Impact Construction Scenario

10.10.2.26 The medium construction scenario for Humber LEP assumes that the ports within Humber could be used during construction for some of the activities. This would enable locally-based suppliers to enter the construction supply chain more easily (particularly as part of installation and commissioning activities).

10.10.2.27 The scenario assumes the blades are being sourced from the facility in the Humber, with the remaining elements of the wind turbine manufacturing activity outside of the Humber LEP and the UK.

10.10.2.28 Local firms would be able to benefit from some of the balance of plant supply chain expenditure and the location of ports in the Humber LEP local economic development study area. The most significant uplift in local sourcing would occur within the installation and commissioning phase. Given that ports within the LEP would be used for some of the activities, it is assumed that local vessels would be used more (but not exclusively) for cable laying.

10.10.2.29 The overall share of construction spend within the Humber would rise to 13% under this construction scenario, totalling approximately £834 million.

Humber High Impact Construction Scenario

10.10.2.30 The high impact construction scenario assumes that local ports in Humber local economic development study area are used more extensively throughout the construction phase. The scenario also assumes that planned strategic investments in the Humber local economic development study area come to fruition, strengthening the capability of the local supply chain and leading to an increased level of sourcing from within the local economic development study area.

10.10.2.31 Under the high impact construction scenario, cables are manufactured within the UK, with an increased proportion of cables installation activity is taking place within the Local Study Area. In addition, throughout the installation and commissioning activity, a much greater proportion of vessels are sourced from the local economic development study area.

10.10.2.32 Under the high impact construction scenario, 18% of total construction expenditure would be spent with companies in the Humber local economic development study area (approximately £1.1 billion in total).

10.10.3 Operation and maintenance phase impact scenarios

10.10.3.1 The scenarios modelled for the O&M of Hornsea Three illustrate the impact that the various sources of uncertainty in the assessment (highlighted in paragraph 10.7.4) would have on the scale and type of impacts which occur in the UK and the Hornsea Three local economic development study areas.

UK impact Operation and Maintenance Scenario

10.10.3.2 Table 10.42. The scenario is based on industry and Ørsted's experience of sourcing O&M workers and supply chains from the UK. Based on experience to date, it is unlikely that an O&M base outside the UK would be chosen for Hornsea Three, and so the impact assessment focuses on one baseline case.

Table 10.42: Sourcing assumptions under the UK Baseline Impact O&M scenario.

| Phase | Estimated Value (£m) | Baseline: Sourced from UK (FTE jobs and % Value) |
|---|----------------------|---|
| Direct employment: administration and management (FTE jobs) | n/a | 20 |
| Direct Employment: technical (FTE Jobs) | n/a | 100 |
| Total Direct FTE Jobs | n/a | 120 |
| Professional services, business rates, insurances, administrative overheads etc. (£m) | £6 | 98% |
| Fuel and utilities (£m) | £2 | 100% |
| Technical and equipment transfer (£m) | £1 | 70% |
| Large component replacement (£m) | £144 | 58% |
| Total Value | £152 | 60% |
| Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. | | |

UK Baseline Operation and Maintenance Impact Scenario

10.10.3.3 The baseline impact O&M scenario is based around the main O&M base and ports being located in the UK. Under this scenario, the majority of activities are taking place in the UK. It is assumed that around 120 FTE direct roles would be based in the UK linked to the O&M port.

10.10.3.4 Under this impact O&M scenario, the supply of vessels increases, allowing firms to capture more of this element of the supply chain. Nacelle and tower-related component replacement remains outside of the UK.

10.10.3.5 Under this scenario, 120 direct FTE jobs would be based in the UK, along with 60% of annual O&M supply chain expenditure, equivalent to approximately £92 million.

Local Economic Development Study Area Operation and Maintenance Scenarios: New Anglia

10.10.3.6 The scenarios for O&M impacts in the New Anglia LEP local economic development study area are outlined in Table 10.43.

Table 10.43: Sourcing assumptions under the New Anglia impact operation and main O&M scenarios.

| Phase | Estimated Value (£m) | Low: Sourced from New Anglia (FTE jobs and % Value) | High: Sourced from New Anglia (FTE jobs and % Value) |
|---|----------------------|---|--|
| Direct employment: administration and management (FTE jobs) | n/a | 0 | 20 |
| Direct Employment: technical (FTE Jobs) | n/a | 0 | 100 |
| Total Direct FTE Jobs | n/a | 0 | 120 |
| Professional services, business rates, insurances, administrative overheads etc. (£m) | £6 | 0% | 13% |
| Fuel and utilities (£m) | £2 | 9% | 61% |
| Technical and equipment transfer (£m) | £1 | 10% | 30% |
| Large component replacement (£m) | £144 | 0% | 23% |
| Total Value | £152 | 0.2% | 23% |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

New Anglia Low Operation and Maintenance Impact Scenario

10.10.3.7 Under the low impact O&M scenario, the activities captured locally are modest, as the main O&M base is assumed to be located outside of the New Anglia local economic development study area. Activities occurring locally are limited to onshore cable route and activities required to service and maintain onshore substations. It is assumed that none of the direct maintenance technicians would be from within the New Anglia area, and none of the vessels used would be chartered from within the local economic development study area. The involvement of local companies in the O&M supply chain is therefore modest.

10.10.3.8 Under the low impact scenario 0.2% of O&M expenditure could be captured in New Anglia, equivalent to approximately £0.25 million per year. This scenario is independent of the expenditure which could take place in the Humber local, as both or neither of the areas could be benefitting from O&M supply chain activities under the low scenario.

New Anglia High O&M Impact Scenario

10.10.3.9 The high impact O&M scenario is based around the main O&M base and ports being located in the New Anglia local economic development study area. Under this scenario, the management and administration functions for Hornsea Three are also carried out locally and so all direct employees would be based in New Anglia.

10.10.3.10 Local firms capture a larger portion of the O&M supply chain expenditure. The supply of local vessels increases under the high impact O&M scenario, allowing local firms to capture more of this element of the supply chain.

10.10.3.11 Under this scenario, 120 direct FTE roles would be based in the New Anglia local economic development study area, and it could capture 23% of annual O&M supply chain expenditure equivalent to approximately £36 million. Please note that under the high impact scenario, activities which could occur in the Humber local economic development study area and the New Anglia local economic development study area are mutually exclusive.

Local Economic Development Study Area Operation and Maintenance Scenarios:

10.10.3.12 The scenarios for O&M impacts in the Humber LEP local economic development study area are outlined in Table 10.44.

Table 10.44: Sourcing assumptions under the Humber impact O&M scenarios.

| Phase | Estimated Value (£m) | Low: Sourced from Humber (FTE jobs and % Value) | High: Sourced from Humber (FTE jobs and % Value) |
|---|----------------------|---|--|
| Direct employment: administration and management (FTE jobs) | n/a | 0 | 20 |
| Direct Employment: technical (FTE Jobs) | n/a | 0 | 100 |
| Total Direct FTE Jobs | n/a | 0 | 120 |
| Professional services, business rates, insurances, administrative overheads etc. (£m) | £6 | 0% | 13% |
| Fuel and utilities (£m) | £2 | 9% | 61% |
| Technical and equipment transfer (£m) | £1 | 10% | 30% |
| Large component replacement (£m) | £144 | 0% | 23% |
| Total Value | £152 | 0.2% | 23% |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

Humber Low Operation and Maintenance Impact Scenario

10.10.3.13 Under the low impact O&M scenario, the activities captured locally are modest, as the main O&M base is located outside of the local economic development study area. Activities occurring locally are limited to onshore cable route and activities required to service and maintain onshore substations. It is assumed that none of the maintenance technicians would be from within the Humber area, and none of the vessels used would be chartered from within the local economic development study area. The involvement of local companies in the O&M supply chain is therefore modest.

10.10.3.14 Under the low impact scenario, it is assumed no direct jobs are located in Humber. 0.2% of O&M supply chain expenditure could be captured in the area, equivalent to approximately £0.25 million per year.

Humber High Operation and Maintenance Impact Scenario

10.10.3.15 The high impact O&M scenario is based around the main O&M base and ports being located in the Humber local economic development study area, supplying 120 direct FTE jobs as the management and administration functions for Hornsea Three are carried out locally.

10.10.3.16 Additionally, local firms capture a larger portion of the O&M supply chain. Under the high impact O&M scenario, the supply of local vessels increases, allowing local firms to capture more of this element of the supply chain.

10.10.3.17 Under this scenario, the Humber local economic development study area could capture 120 direct FTE jobs and 23% of annual O&M supply chain expenditure, or equivalent to approximately £36 million.

10.11 Assessment of significance

10.11.1 Construction phase

10.11.1.1 The impacts of the offshore and onshore construction of Hornsea Three have been assessed on socio-economics. The potential impacts arising from the construction of Hornsea Three are listed in Table 10.30, along with the maximum design scenario against which each construction phase impact has been assessed.

10.11.1.2 A description of the potential effect on socio-economics receptors caused by each identified impact is given in the following sections.

Impacts of construction may affect employment in construction and the supply chain.

10.11.1.3 The amount of construction and supply chain employment generated in the local and UK economic development study area is driven primarily by two factors. Firstly, the level of direct construction expenditure (on turbine equipment, transportation, installation and commissioning of onshore and offshore infrastructure) will govern the absolute amount of potential employment that the construction phase could support. Secondly, the amount of this potential employment impact that benefits the economic development study areas hinges on the geographical distribution of the construction expenditure. This will be influenced by both the ports which are used during the construction phase, as well as the geography of Hornsea Three's supply chain.

Magnitude of impact: UK Economic Development Study Area

10.11.1.4 Table 10.45 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the construction phase throughout the UK.

Table 10.45: Summary of estimated levels of employment during construction for the UK Study Area.

| Impact type | Person years of employment | | | Average annual employment (FTE) over the construction period | | |
|--------------|----------------------------|-----------------|---------------|--|-----------------|---------------|
| | Low Scenario | Medium Scenario | High Scenario | Low Scenario | Medium Scenario | High Scenario |
| Direct | 4,170 | 10,420 | 15,130 | 930 | 2,320 | 3,360 |
| Indirect | 3,710 | 11,100 | 16,990 | 820 | 2,470 | 3,780 |
| Total | 7,880 | 21,520 | 32,120 | 1,750 | 4,790 | 7,140 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.1.5 The potential employment ranges from 7,880 and 32,120 person years of employment under the low and high construction impact scenarios respectively. This includes the direct and supply chain employment impacts. In annual terms, the construction phase of Hornsea Three could support between 1,750 and 7,140 FTEs under the low and high scenarios respectively.

10.11.1.6 The baseline section set out the current level of employment in the sectors related to direct supply chain activities, which currently employ approximately 2.5 million FTEs in the UK (see Table 10.15). During the construction period, the maximum average annual direct employment impact in these sectors would be 3,360 (under the high impact scenario) which would represent 0.1% of the current baseline level of employment in these sectors nationally.

10.11.1.7 The indirect effects would be spread across a much wider set of sectors. The baseline level of national FTE employment is presented in **Table 10.11**. Under the highest impact scenario, the indirect employment effects (3,780 FTEs per year on average) would represent around 0.1% of current national employment. In addition to the indirect impacts, there would also be induced impacts, which would be spread across a much wider set of sectors as outlined in the methodology (see paragraphs 10.9.2.22 to 10.9.2.24). The level of uncertainty about the scale of these effects means that they have not been assessed quantitatively. As such, the assessment should be considered as providing a conservative estimate of the employment creation potential of construction activity.

10.11.1.8 Given the small percentage changes that the direct and indirect effects would stimulate, even under the highest impact scenario, the construction of Hornsea Three is not expected to result in a noticeable change in baseline conditions within the UK economic development study area.

10.11.1.9 The impact is predicted to be of national spatial extent, short term duration and continuous. The direct effects outlined in the above paragraphs will affect the receptor directly although there will also be indirect effects which occur through the supply chains of those businesses in the upper tiers of the construction supply chain. In the context of the current levels of employment in relevant sectors in the UK, the direct and indirect effects are unlikely to produce any noticeable changes in baseline conditions. The magnitude is therefore, considered to be negligible for all scenarios.

Sensitivity of receptor

10.11.1.10 Employment creation is a strategic priority for the UK economy. The recent White Paper on Industrial Strategy sets out the vision to create a prosperous UK economy, with high productivity and high value jobs. The UK labour market has recovered well since the economic downturn, experiencing positive growth in employee jobs each year between 2012 and 2016.

10.11.1.11 The economic recovery is moving in the right direction, but economic development policies recognise the need to do more. The UK average figures can mask the areas of underperformance across the UK, so there is a need for growing places to continue prospering and the rest of the UK to keep pace. Moreover, technological progress is changing the nature of jobs. The implication of UK employment is that there is a continued need to deliver new employment opportunities in order to safeguard current employment as well as creating new jobs. Increasingly, jobs require higher level skills and the labour market will need to adapt to these changes to be able to fill jobs with workers from within the UK.

10.11.1.12 Therefore, given the strategic importance of employment creation across the UK, especially in high value sectors, the construction and related manufacturing employment is deemed to be of high sensitivity.

Significance of the effect

10.11.1.13 The headline total numbers for the construction employment generated appear large, however, they will not stimulate any discernible change in the size of the wider employment base in construction-related sectors in the UK. The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

Hornsea Three: New Anglia LEP Local Economic Development Study Area

Magnitude of impact

10.11.1.14 Table 10.46 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the construction phase throughout the New Anglia local economic development study area.

Table 10.46: Summary of estimated levels of employment during construction for the New Anglia Local Economic Development Study Area.

| Impact type | Person years of employment | | Average annual employment (FTE) | |
|--------------|----------------------------|-----------------|---------------------------------|-----------------|
| | Low Scenario | Medium Scenario | Low Scenario | Medium Scenario |
| Direct | 270 | 1,550 | 60 | 340 |
| Indirect | 250 | 2,430 | 60 | 540 |
| Total | 520 | 3,980 | 120 | 880 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant.

10.11.1.15 The potential employment impact ranges from 520 to 3,980 person years of employment under the low and medium construction impact scenarios respectively. This includes the direct and supply chain employment impacts.

10.11.1.16 Given the length of the construction period, Hornsea Three could on average support between 120 and 880 FTEs annually under the low and medium scenarios respectively. As with the UK level impact assessment, we would expect the direct employment effects to be concentrated in a small number of sectors. The current level of employment in relevant sectors is presented in the baseline section in Table 10.15.

10.11.1.17 The uplift on the baseline level of employment in these sectors will differ across the two construction scenarios as shown in Table 10.47, although. For both the low and medium impact scenarios represent, there will be a small increase in employment locally in these sectors (less than 1%).

Table 10.47: Summary of predicted uplift in employment in New Anglia Local Economic Development Study Area as a result of direct effects.

| Scenario | Current employment in Sectors Likely to Benefit from Direct Effects (FTE 000s) | Average Annual Direct Employment Impact During Construction | % of Baseline |
|----------|--|---|---------------|
| Low | 76 | 60 | 0.1% |
| Medium | | 340 | 0.4% |

Source: Impact calculations by Regeneris Consulting, 2017. Employment estimate from Business Register Employment Survey, 2016.

10.11.1.18 Indirect effects would be spread across the economy, so the most appropriate benchmark against which to measure the magnitude of impact is the total employment in all sectors (see **Table 10.11**). Under all scenarios, the overall impact of employment generated during the construction period will be less than 0.1% of the total employment in the New Anglia local economic development study area (Table 10.48).

Table 10.48: Summary of predicted uplift in employment in New Anglia local economic development study area as a result of indirect effects.

| Scenario | Total Current Employment (000 FTEs) | Average Annual Indirect Employment Impact During Construction | % of Baseline |
|----------|-------------------------------------|---|---------------|
| Low | 551 | 60 | 0.01% |
| Medium | | 540 | 0.1% |

Source: Impact calculations by Regeneris Consulting, 2017. Employment estimate from Business Register Employment Survey, 2015.

10.11.1.19 For all scenarios, the combined direct and indirect effects on employment are expected to result in only a very slight change in baseline conditions within the New Anglia local economic development study area.

10.11.1.20 The impact is predicted to be of local spatial extent, short term duration and continuous. The direct effects outlined in the above paragraphs will affect the receptor directly, although there will also be indirect effects which occur through the supply chains of businesses in the upper tiers of the construction supply chain, and as a result of the expenditure in the local economy. In the context of the current level of employment in relevant sectors in the New Anglia local economic development study area, the magnitude is considered to be negligible for all impact scenarios.

Sensitivity of receptor

10.11.1.21 New Anglia LEP SEP focuses on employment creation as one of its key priorities, aiming to create 95,000 jobs up to 2021. The socio-economic baseline has shown that New Anglia LEP exhibits strong labour market performance, which exceeds the national level of employment and economic activity. The unemployment rate in New Anglia is also lower than the UK – 4% compared to the national 5%. However, despite a strong overall performance, it is important to bear in mind the diversity of New Anglia LEP, which contains 14 individual local authorities. Within these local authorities, there are areas of significant underperformance. These areas tend to be the coastal districts and boroughs that are likely to host the activities associated with Hornsea Three construction phase.

10.11.1.22 Given the strategic importance of employment creation across New Anglia Local Study Area, the construction and related manufacturing employment is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore deemed to be high.

Significance of the effect

10.11.1.23 Although the absolute number of jobs created during the construction phase is considerable, the extent to which this will stimulate a discernible change in baseline conditions is limited for both impact scenarios. The effect would therefore, be of **minor beneficial** significance for both impact scenarios, which is not significant in EIA terms.

Hornsea Three: Humber LEP Local Economic Development Study Area

Magnitude of impact

10.11.1.24 Table 10.49 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the construction phase throughout the Humber local economic development study area.

Table 10.49: Summary of estimated levels of employment during construction for the Humber Local Economic Development Study Area.

| Impact type | Person years of employment | | | Average annual employment (FTE) | | |
|--------------|----------------------------|-----------------|---------------|---------------------------------|-----------------|---------------|
| | Low Scenario | Medium Scenario | High Scenario | Low Scenario | Medium Scenario | High Scenario |
| Direct | 270 | 4,400 | 8,630 | 60 | 980 | 1,920 |
| Indirect | 250 | 5,230 | 9,640 | 60 | 1,160 | 2,140 |
| Total | 520 | 9,630 | 18,270 | 120 | 2,140 | 4,060 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.1.25 The potential employment ranges from 520 and 18,270 person years of employment under the low and high construction impact scenarios respectively. This includes the direct and supply chain employment impacts. On average, the construction phase of Hornsea Three could support between 120 and 4,060 FTEs annually under the low and high scenarios respectively. As with the UK level and New Anglia impact assessment, we would expect the direct employment effects to be concentrated in a small number of sectors: manufacturing and engineering, construction, land and marine transport, professional services, and accommodation and food services. The current level of employment in these sectors is presented in the baseline section in Table 10.29. The uplift on the baseline level of employment in these sectors will differ across the three construction scenarios as shown in Table 10.50.

10.11.1.26 For the low impact scenario, there will be a small increase in employment locally in these sectors (0.2%). Under the medium and high impact scenarios, the average annual direct employment impact would be an uplift of 980 and 1,920 jobs, representing 2.5% and 4.9% in the relevant sectors (Table 10.50).

Table 10.50: Summary of predicted uplift in employment in the Humber as a result of direct effects.

| Scenario | Current Employment in Sectors Likely to Benefit from Direct Effects (FTE 000s) | Average Annual Direct Employment Impact During Construction | % of Baseline |
|----------|--|---|---------------|
| Low | 39 | 60 | 0.2% |
| Medium | | 980 | 2.5% |
| High | | 1,920 | 4.9% |

Source: Source: Impact calculations by Regeneris Consulting (2017). Employment estimate from Business Register Employment Survey (2016).

10.11.1.27 Indirect effects during the construction period will be less than 1% of the total employment in the Humber LEP local economic development study area (see Table 10.51).

Table 10.51: Summary of predicted uplift in employment in the Humber as a result of indirect effects.

| Scenario | Current total Employment (FTE 000s) | Average Annual Indirect Employment Impact During Construction | % of Baseline |
|----------|-------------------------------------|---|---------------|
| Low | 317 | 60 | 0.0% |
| Medium | | 1,160 | 0.4% |
| High | | 2,140 | 0.7% |

Source: Impact calculations by Regeneris Consulting (2017). Employment estimate from Business Register Employment Survey (2015). Figures may not sum due to rounding.

10.11.1.28 For all scenarios, the combined direct and indirect effects on employment are expected to result in only a very slight change in baseline conditions within the Humber local economic development study area.

10.11.1.29 The impact is predicted to be of local spatial extent, short term duration and continuous. The direct effects outlined in the above paragraphs will affect the receptor directly, although there will also be indirect effects which occur through the supply chains of businesses in the upper tiers of the construction supply chain, and as a result of the expenditure in the local economy. In the context of the current level of employment in relevant sectors in the Humber local economic development study area, the magnitude is considered to be negligible for low and medium impact scenarios, and minor for the high impact scenario.

Sensitivity of receptor

10.11.1.30 Humber LEP SEP focuses on employment creation as one of its key priorities. The socio-economic baseline has shown that Humber local economic development study area exhibits similar unemployment rates as the national average (both 5%), however, there is some variation within the Humber, as Kingston upon Hull reaches unemployment levels of over 7%. Fluctuations in the levels of employee jobs are much more pronounced in the Humber than nationally, as outlined in the baseline section. This points to a need to support stable and secure employment opportunities in the Humber to make the area more resilient to economic fluctuations. For example, between 2010 and 2012, the Humber local economic development study area employee jobs were disproportionately affected, with negative annual growth rates up until 2013.

10.11.1.31 Given the strategic importance of employment creation across Humber local economic development study area and the need for secure and resilient employment in the Humber the construction and related manufacturing employment is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore deemed to be high.

Significance of the effect.

10.11.1.32 Although the absolute number of jobs created during the construction phase is substantial, the extent to which this will stimulate a discernible change in baseline conditions is limited for all impact scenarios. The effect would therefore, be of **minor beneficial** significance for the low and medium impact scenarios, which is not significant in EIA terms. For the high impact scenario, the effect would be of **moderate beneficial** significance, which is significant in EIA terms. The significance of effects on this receptor is driven by the high sensitivity of the receptor rather than the magnitude of change that Hornsea Three is expected to stimulate.

Impacts of construction may have an impact on the amount of GVA supported by construction activity.

10.11.1.33 The potential effect on economic activity and GVA during the construction phase has been assessed using the same scenario approach as described for the assessment of employment.

UK Economic Development Study Area

Magnitude of impact

10.11.1.34 Table 10.52 sets out the predicted levels of aggregate GVA impacts of construction activity on the UK for the three impact scenarios during the construction phase. As for the assessment of the employment receptor, the assessment here focuses on direct and indirect effects.

Table 10.52: Summary of estimated levels of GVA impact during construction for the UK Economic Development Study Area.

| Impact type | GVA (£millions) | | |
|--------------|-----------------|-----------------|---------------|
| | Low Scenario | Medium Scenario | High Scenario |
| Direct | £260 | £640 | £940 |
| Indirect | £240 | £720 | £1,120 |
| Total | £500 | £1,360 | £2,060 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.1.35 Construction activity is expected to deliver an aggregate GVA impact of between £500 million and £2.1 billion across the UK as a whole. This aggregate GVA impact data has been used to estimate annual average GVA impacts during the construction period. These estimates are for illustrative purposes only, and do not reflect the actual flow of work and expenditure that is expected during the construction period. The percentage uplift on national GVA that the estimated annual GVA would represent when annualised is outlined in Table 10.53.

Table 10.53: Summary of estimated levels of construction impact on GVA for the UK Economic Development Study Area.

| | Low Scenario | Medium Scenario | High Scenario |
|--|--------------|-----------------|---------------|
| Estimated annual GVA impact (£ millions) | £111 | £302 | £458 |
| % of 2015 UK GVA (£1,666 billion) | 0.01% | 0.02% | 0.03% |

Source: GVA data: ONS, Sub-regional GVA (ONS, 2016). Impact calculations by Regeneris Consulting, 2017. Note: numbers are rounded.

10.11.1.36 For all impact scenarios, the GVA impacts would deliver only a very slight increase in UK level GVA – less than 0.1% of the 2015 GVA total in all cases.

10.11.1.37 The impact is predicted to be of national spatial extent, short term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible for all impact scenarios.

Sensitivity of receptor

10.11.1.38 GVA is an important measure of wealth creation within an economy and provides a measurement of the difference between the value of goods and services produced in the economy (i.e. the output) and the cost of producing them (i.e. the goods, services and labour inputs required). Nationally, GVA is an important measure of the productivity of the economy and the amount of wealth that economic activity is creating. Recent economic development strategies place an emphasis on improving the productivity of the UK economy, implying the importance of GVA growth (as set out in the Industrial Strategy White Paper).

10.11.1.39 In light of the strategic importance attached to the creation of wealth and economic growth as set out in the baseline section, the GVA receptor is deemed to be of high value and moderate vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of the effect

10.11.1.40 The significance of the effect on GVA is driven by the sensitivity of the receptor rather than the magnitude of change. The absolute level of GVA creation during construction phase does not represent a discernible change from the national baseline level. However, given the high sensitivity of the receptor, the assessment concludes the effect will be of **minor beneficial** significance, which is not significant in EIA terms.

Hornsea Three: New Anglia LEP Local Economic Development Study Area

Magnitude of impact

10.11.1.41 Table 10.54 sets out the predicted levels of cumulative GVA impacts of construction activity on the Hornsea Three New Anglia local economic development study area for the two impact scenarios during the construction phase.

Table 10.54: Summary of estimated levels of construction impact on GVA for the New Anglia Local Economic Development Study Area.

| Impact Type | Low Scenario (GVA £millions) | Medium Scenario (GVA £millions) |
|-------------|------------------------------|---------------------------------|
| Direct | £20 | £120 |
| Indirect | £20 | £160 |
| Total | £40 | £280 |

Source: ONS, Sub-regional GVA (ONS, 2016). Impact calculations by Regeneris Consulting, 2017. Figures may not sum due to rounding.

10.11.1.42 Construction activity is expected to deliver a cumulative GVA impact of between £40 million and £280 million across the New Anglia Local Study Area. The GVA impact data presented above has been used to estimate annual average GVA impacts during the construction period. These estimates are for illustrative purposes only, and do not reflect the actual flow of work and expenditure that is expected during the construction period. The percentage uplift on GVA in the New Anglia local economic development study area that the estimated annual GVA would represent when annualised is outlined in Table 10.55.

Table 10.55: Summary of estimated levels of construction impact on GVA for the New Anglia Local Economic Development Study Area.

| | Low Scenario | Medium Scenario |
|--|--------------|-----------------|
| Estimated annual GVA impact (£ millions) | £9 | £60 |
| % of 2015 New Anglia LEP GVA (£35 billion) | 0.03% | 0.2% |

Source: ONS, Sub-regional GVA (ONS, 2016). Impact calculations by Regeneris Consulting, 2017.

10.11.1.43 Based on the estimates above, the low impact scenario is not expected to produce a noticeable change in the baseline level of GVA across the local economic development study area. The medium impact scenario is expected to result in a noticeable, albeit very minor shift change in the baseline level of GVA (of 0.2%).

10.11.1.44 The impact is predicted to be of local spatial extent, short term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible for the low and the medium scenario.

Sensitivity of receptor

10.11.1.45 The policy section for New Anglia LEP local economic development study area highlights the focus within local economic development policies on boosting the level of GVA creation (see section 10.7.1). GVA performance across New Anglia local economic development study area has been slightly behind national trends, with GVA having increased by 20% overall compared to 21% nationally between 2009 and 2015. However, the level of productivity across the local economic development study area is significantly below the national average, with £21,800 compared to the national £25,600. This productivity level presents a 18% productivity gap, and closing it is one of the main priorities identified in New Anglia's SEP.

10.11.1.46 In light of the strategic importance attached to the creation of economic growth and GVA, and the below average performance on this indicator compared to the national average, the GVA receptor is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of the effect

10.11.1.47 The effect will therefore be of **minor beneficial** significance for the low and medium impact scenario, which is not significant in EIA terms.

Hornsea Three: Humber LEP Local Economic Development Study Area

Magnitude of impact

10.11.1.48 Table 10.56 sets out the predicted levels of cumulative GVA impacts of construction activity on the Hornsea Three local economic development study area for the three impact scenarios during the construction phase.

Table 10.56: Summary of estimated levels of construction impact on GVA for the Humber Local Economic Development Study Area.

| Impact Type | Low Scenario (GVA £millions) | Medium Scenario (GVA £millions) | High Scenario (GVA £millions) |
|-------------|---------------------------------|------------------------------------|----------------------------------|
| Direct | £20 | £260 | £510 |
| Indirect | £20 | £340 | £630 |
| Total | £40 | £600 | £1,140 |

Source: ONS, Sub-regional GVA (ONS, 2016). Impact calculations by Regeneris Consulting, 2017. Figures may not sum due to rounding.

10.11.1.49 Construction activity is expected to deliver a cumulative GVA impact of between £40 million and £1.1 billion across the Humber local economic development study area. The GVA impact data presented above has been used to estimate annual average GVA impacts during the construction period. These estimates are for illustrative purposes only, and do not reflect the actual flow of work and expenditure that is expected during the construction period. The percentage uplift on GVA in the Humber LEP local economic development study area that the estimated annual GVA would represent when annualised is outlined in Table 10.57.

Table 10.57: Summary of estimated levels of construction impact on GVA for the Humber Local Economic Development Study Area.

| | Low Scenario | Medium Scenario | High Scenario |
|--|--------------|-----------------|---------------|
| Estimated annual GVA impact (£ millions) | £9 | £133 | £253 |
| % of 2015 Humber LEP GVA (£17.8 billion) | 0.0% | 0.7% | 1.4% |

Source: ONS, Sub-regional GVA (ONS, 2016). Impact calculations by Regeneris Consulting, 2017.

10.11.1.50 Based on the estimates above, the low impact scenario is not expected to produce a noticeable change in the baseline level of GVA across the Humber local economic development study area. The medium and high impact scenarios are expected to result in a noticeable, albeit minor change in the baseline level of GVA (of 0.7% and 1.4% respectively).

10.11.1.51 The impact is predicted to be of local spatial extent, short term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be negligible for the low scenario, minor for the medium scenario, and major for the high impact scenario.

Sensitivity of receptor

10.11.1.52 GVA is a useful indicator of the productivity and competitiveness of a local economy. It provides a useful measure of the level of wealth that an area's economy creates that is not described by metrics such as employment or GDP. The policy section highlights the focus within local economic development policies on boosting the level of GVA creation. GVA performance across Humber local economic development study area is below the national growth rates, having been disproportionately affected by the recession. Since 2009, the level of GVA across Humber local economic development study area increased by only 2% overall compared to 21% nationally. Furthermore, productivity performance as measured by GVA per head is 25% below the national average (as shown earlier in the chapter).

10.11.1.53 In light of the strategic importance attached to the creation of economic growth and GVA, and the below average performance on this indicator compared to the national average, the GVA receptor is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of the effect

10.11.1.54 The effect will therefore be of **minor beneficial** significance for the low impact scenario, which is not significant in EIA terms. For the medium scenario, the effect will be of **moderate beneficial** significance, which is significant in EIA terms. Finally, for the high impact scenario, the effect will be of **major beneficial** significance, which is significant in EIA terms.

The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents.

10.11.1.55 Employment supported in the Humber LEP and New Anglia LEP local economic development study area during the construction phase will increase the supply of employment opportunities at companies based in the Hornsea Three local economic development study area: Humber LEP and New Anglia LEP. These jobs could feasibly be taken up by:

- People living within the local economic development study area;
- People commuting into the local economic development study area on a daily basis; and
- People migrating into the local economic development study area to take up employment. As much of the construction employment is temporary, this is expected to be a small proportion of the total.

10.11.1.56 As set out in the outline of impact scenarios, the scenarios for New Anglia LEP and Humber LEP are independent of each other, and at this stage it is not possible to confidently predict which areas are going to benefit.

10.11.1.57 It is common for developers of wind farms to promote direct employment opportunities in the local economic development study areas. However, it should be noted that the potential for local people to access employment opportunities generated as a result of the construction phase is dependent on the match between the type of employment generated (which is driven largely by the sectoral distribution of the employment impacts locally in the local economic development study areas) and the skills and occupational profile of local residents. As outlined under the assessment of employment impacts, it is reasonable to expect that the direct employment effects would be focused on a small number of sectors, whilst indirect effects would be spread more widely across the employment base in the local economic development study areas.

10.11.1.58 The magnitude of the impact on access to construction-related employment amongst local residents has been assessed based on:

- The existing concentrations of employment in relevant sectors (and therefore the likelihood that there is sufficient capability and capacity in the sector locally to capture construction-related opportunities);
- The level of relevant capacity in the local labour market, measured by the number of unemployed people seeking employment; and
- The potential impact of the employment created on the baseline number of people seeking employment.

Magnitude of impact:

10.11.1.59 Given the highly specialist nature of much of the manufacturing activity (particularly with regard to the manufacture of the nacelle, rotor and blades), the impact analysis assumes that most of the opportunities that would occur in the local economic development study areas would be related primarily to:

- Lower tier manufacturing contracts (for example the supply of components);
- Specialist construction activities;
- Land and water based transport; and
- Accommodation and food service.

10.11.1.60 The baseline section highlights the existing concentrations of employment within many of the sectors expected to benefit from direct employment impacts and supply chain opportunities associated with the construction of Hornsea Three. These concentrations of employment indicate that there are local firms that will be able to complete for tier one (i.e. directly contracted to the Applicant) and tier two (i.e. contracted to suppliers of the Applicant) contracts in many of the sectors most likely to benefit from construction activity. This means that there is potential for new employment opportunities to be created locally in addition to supporting existing employment in local firms. However, it is not possible to quantitatively predict what proportion of the average annual direct and indirect employment impact would be locally advertised and available to local people.

New Anglia LEP Local Economic Development Study Area

10.11.1.61 The scenario analysis indicates that the direct and indirect employment impacts (i.e. those which we expect to occur in the sectors outlined above) associated with construction activity would range from 120 to 880 annual FTEs per year in New Anglia.

10.11.1.62 The socio-economic baseline highlights limited capacity within the labour market locally; there are 33,000 unemployed residents across the New Anglia local economic development study area and in 2017, there were on average 14,200 claimants in the New Anglia LEP seeking employment. This suggests that there is sufficient overall capacity within the labour market to enable local people to benefit from employment opportunities associated with the construction of Hornsea Three.

10.11.1.63 It is no longer possible using published data sources to quantitatively estimate how many unemployed residents are seeking work in sectors which are relevant to the construction of Hornsea Three. This is due to a change in the availability of a sectoral breakdown of ONS Claimant Count data. Analysis of labour market capacity in the years before Universal Credit was rolled out, when a sectoral breakdown of claimant data was possible, indicates that residents seeking employment occupations relevant to wind farm construction accounted for between 30% and 40% of claimants (ONS, 2013). This is likely to be the upper limit, as since 2013 demand for construction related employment has been high. Although not up to date, this does suggest that there is likely to be sufficient capacity and capability locally to enable local residents to access employment opportunities associated with the construction of Hornsea, provided the occupational mix of those seeking employment is consistent with that in previous years.

10.11.1.64 Hornsea Three will inevitably draw some of its labour from outside of the local economic development study area, however it is reasonable to expect that some new employment opportunities will be created locally and could be taken up by people living in the local economic development study area. Table 10.58 shows that the employment effect in New Anglia under the medium impact scenario has potential to deliver a noticeable change in the baseline number of residents seeking employment (provided employment seekers are looking to work in relevant occupations and these positions are advertised locally), while the magnitude of change under the low impact scenario would be more limited.

Table 10.58: Summary of predicted uplift in employment in New Anglia Local Economic Development Study Area.

| Scenario | Number of Claimants | Average Annual Direct and Indirect Employment Impact During Construction | % of Baseline |
|----------|---------------------|--|---------------|
| Low | 14,200 | 120 | 1% |
| Medium | | 880 | 6% |

Source: ONS Claimant Count (ONS, 2017), Regeneris Consulting impact calculations 2017.

10.11.1.65 The impact is predicted to be of local spatial extent, short term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible for low impact scenario, and major for medium impact scenario.

Sensitivity of receptor

10.11.1.66 New Anglia shows a low level of unemployment of 4% compared to the national rate of 5%. There is variation in unemployment levels within the local economic development study area, with areas such as Great Yarmouth reaching 6% unemployment. This points to the receptor being of medium sensitivity. The unemployment level points towards limited capacity in the local labour market, however, within areas such as Great Yarmouth the economic development policy points towards worklessness and unemployment being a socio-economic challenge that needs to be addressed. The need to create employment opportunities is an important strategic priority within local economic development strategies as well as the local economic development study area, which aims to deliver 95,000 jobs in the area in the next decade. There appears to be a strong policy and socio-economic rationale to rate local employment creation as a high sensitivity receptor, given the concentrations of unemployment that exist and the high profile of employment-related actions within economic development policy.

10.11.1.67 In light of the strategic importance attached to the creation of employment opportunities for local residents and the role this plays in supporting wider socio-economic benefits, the access to local employment receptor is deemed to be of high value and medium vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of the effect

10.11.1.68 The significance of effects on this receptor is driven by the extent to which employment accessed by local residents would stimulate a noticeable change in the level of unemployment locally. This varies in accordance to the absolute level of employment created (and therefore across the impact scenarios). The high sensitivity of this receptor (given the strategic importance attached to creating employment opportunities for local residents) amplifies the significance of the effects.

10.11.1.69 Under the low impact scenario, the effect will be limited by the relatively small employment creation locally. It is therefore expected to be of **negligible** significance, which is not significant in EIA terms.

10.11.1.70 The medium impact scenario could stimulate a high magnitude of change in both local economic development study areas and would result in effects of **major beneficial** significance, which is significant in EIA terms.

Humber LEP Local Economic Development Study Area

10.11.1.71 The scenario analysis indicates that the direct and indirect employment impacts would range from 120 to 4,060 annual FTEs.

10.11.1.72 The socio-economic baseline highlights limited capacity within the labour market locally. In 2017, there were on average 14,800 claimants in the Humber LEP seeking employment. This suggests that there is sufficient overall capacity within the labour market to enable local people to benefit from employment opportunities associated with the construction of Hornsea Three.

10.11.1.73 However, it is important to also consider the capability within the labour market to be able to assess the ability of local residents to meet the employment requirement. It is no longer possible using published data sources to quantitatively estimate how many unemployed residents are seeking work in sectors which are relevant to the construction of Hornsea Three. This is due to a change in the availability of a sectoral breakdown of ONS Claimant Count data. Analysis of labour market capacity in the years before Universal Credit was rolled out, when a sectoral breakdown of claimant data was possible, indicates that residents seeking employment occupations relevant to wind farm construction accounted for between 30% and 40% of claimants (ONS, 2013). This is likely to be the upper limit, as since 2013 demand for construction related employment has been high. Although not up to date, this does allow a tentative conclusion that there is likely to be sufficient capacity and capability locally to enable local residents to access employment opportunities associated with the construction of Hornsea, provided the occupational mix of those seeking employment seekers is consistent with that in previous years.

10.11.1.74 Hornsea Three will inevitably draw some of its labour from outside of the local economic development study area, however it is reasonable to expect that some new employment opportunities will be created locally and could be taken up by people living in the local economic development study area. The employment effect in Humber under the medium and high impact scenarios has potential to deliver a large change in the baseline number of residents seeking employment. Again, this is subject to there being a strong match between the skills and expertise of claimants and any employment opportunities created locally.

Table 10.59: Summary of predicted uplift in employment in Humber Local Economic Development Study Area

| Scenario | Number of Claimants | Average Annual Direct and Indirect Employment Impact During Construction | % of Baseline |
|----------|---------------------|--|---------------|
| Low | 14,800 | 120 | 1% |
| Medium | | 2,140 | 14% |
| High | | 4,060 | 27% |

Source: ONS Claimant Count (ONS, 2017), Regeneris Consulting impact calculations 2017.

Sensitivity of receptor

- 10.11.1.75 Concentrations of unemployment and economic inactivity within the Humber LEP local economic development study area point towards this receptor being sensitive. Taking the Humber local economic development study area as a whole, the unemployment rate (5% of working age population) is comparable to the national rate of 5%. For the Humber local economic development study area as well as in all local authorities within it, the need to create employment opportunities locally receives high strategic priority within economic development strategies and is supported by aims which seek to improve resident's ability to access employment opportunities.
- 10.11.1.76 There appears to be a strong policy and socio-economic rationale to rate local employment creation as a high sensitivity receptor, given the concentrations of unemployment that exist and the high profile of employment-related actions within economic development policy in both local economic development study areas.
- 10.11.1.77 In light of the strategic importance attached to the creation of employment opportunities for local residents and the role this plays in supporting wider socio-economic benefits, the access to local employment receptor is deemed to be of high value and medium vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of the effect

- 10.11.1.78 The significance of effects on this receptor is driven by the extent to which employment accessed by local residents would stimulate a noticeable change in the level of unemployment locally. This varies in accordance to the absolute level of employment created (and therefore across the impact scenarios). The high sensitivity of this receptor (given the strategic importance attached to creating employment opportunities for local residents) amplifies the significance of the effects.
- 10.11.1.79 Under the low impact scenario, the effect will be limited by the relatively small employment creation locally. It is therefore expected to be of **negligible** significance, which is not significant in EIA terms.

10.11.1.80 The medium and high impact scenarios could stimulate a high magnitude of change in both local economic development study area and would result in effects of **major beneficial** significance, which is significant in EIA terms.

The construction of Hornsea Three may have an impact on demand for housing, accommodation and local services in the Local Economic Development Study Area.

Magnitude of impact:

- 10.11.1.81 The impact of Hornsea Three on demand for housing and other services during the construction phase is dependent on the number of direct and indirect jobs generated during the construction phase, and the extent to which the workforce is utilised locally. The demand for housing, accommodation and services during the construction phase is therefore influenced by two key factors.
- 10.11.1.82 Firstly, the ability of local people to access employment created in local firms will determine whether or not local companies need to look outside of the New Anglia or Humber LEP local economic development study area for their workforce on a large scale. The level of capacity within the local labour market is considered under the assessment of the access to construction-related employment receptor. It is expected that there is sufficient capacity within the local labour market to meet the employment demand that will be created within each of the local economic development study areas as a result of construction activity. As the capacity exists locally, it is expected that construction employment supported in firms based within the local economic development study areas would be more likely to be filled by local people (particularly given the travel to work partners locally). As a result, there would be a very limited effect on the demand for housing, temporary accommodation or other local services.
- 10.11.1.83 The wider geography of the construction supply chain will determine the extent to which temporary workers from outside of the New Anglia or Humber local economic development study areas will be required. Due to their specialist nature, it is likely that many of the larger upper tier contracts will be delivered by companies from outside of the local economic development study area. While the employment impact associated with these contracts is not attributed to the local economic development study areas, it is likely that for some parts of the construction period, some of the workers from other parts of the UK, or overseas suppliers, will need to be on or close to the development site.
- 10.11.1.84 While there may be some local recruitment by suppliers based outside the Hornsea local economic development study areas (including those from overseas) for this close-to-site activity, it is much more likely that these companies would bring their own workforce with them, increasing the demand for temporary accommodation and services within the local economic development study area. This would only be a consideration under the medium impact scenario (i.e. where the construction port is within the local economic development study areas). It is reasonable to assume that although local firms will be able to access some contracts in the upper tiers of Hornsea Three's supply chain (mostly related to port activities and onshore installation activities), many of these upper tier contracts tend to be large and specialised, and there is a likelihood that these will be fulfilled by contractors from outside of the local economic development study area.

10.11.1.85 While there may be some requirement for temporary accommodation as part of the construction phase, it is very difficult to be definitive about the number of workers from outside of the area who would require temporary accommodation. Given the importance of the tourism sector to the New Anglia local economic development study area, there is a substantial supply of serviced accommodation locally, which is spread across the area in a range of coastal locations, and which can be underutilised for part of the season. It is therefore likely that there will be adequate provision locally to accommodate this additional requirement.

10.11.1.86 It is important to note that there will be positive effects associated with demands for accommodation, housing and local services which arise through temporary in-migration of labour. As it is not possible to quantify the number of workers who will be coming into the area and for how long, this element of increased demand has not been factored into the assessment of this receptor. As such, it should be noted that the assessment presents a conservative view of the likely effects on this receptor.

10.11.1.87 Both New Anglia and Humber are relatively large economies with a population of more than 1.6 million and 0.9 million people respectively. In this context, we expect that even under the medium impact scenario for New Anglia and high impact scenario for Humber, the areas should be able to absorb the additional incoming workers without causing a strain on local services and housing.

10.11.1.88 The impact is predicted to be of local spatial extent, short term duration and intermittent. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible for both economic development study areas.

Sensitivity of receptor

10.11.1.89 Local policy recognises the importance of housing provision to enable economic growth, however, it does not highlight any significant challenges with regard to under / over-supply of housing across the New Anglia LEP local economic development study area.

10.11.1.90 The receptor is deemed to be of medium value and medium vulnerability. The sensitivity of the receptor is therefore, considered to be medium.

Significance of the effect

10.11.1.91 There is likely to be some requirement for temporary accommodation during the construction phase if a construction port is chosen in the New Anglia LEP local economic development study area. While the exact scale of demand is difficult to predict, in the context of the wider supply of housing and local services, this is not expected to stimulate an unserviceable demand. The magnitude of impact is expected to be negligible, which will result in an effect of **negligible** significance, which is not significant in EIA terms.

The construction of Hornsea Three may have an impact on the performance of the renewable energy sector.

10.11.1.92 Alongside the direct and indirect economic effects arising as a result of the construction phase, there is potential for the additional economic activity to contribute to wider benefits for the renewable energy sector (which encompasses the related sectors of construction, engineering and marine transport) in the local economic development study area.

10.11.1.93 The additional economic activity arising through the construction phase could give rise to catalytic effects which could stimulate improved performance in the renewables sector locally.

10.11.1.94 Growth in the renewable energy sector as a result of the increased economic activity associated with Hornsea Three could arise largely through additional investment (for example in workforce skills, capital equipment and premises), enhanced expertise and access to new markets that the additional economic activity would bring with it. These effects would in turn help to attract inward investors to the area, who would be attracted by the availability of skills and expertise in the supply chain.

10.11.1.95 While these effects would be driven by the injection of economic value into the economy of the Local Study Areas as a result of the Hornsea Three development, their catalytic nature means that they can be sustained to some degree after the construction phase is complete.

10.11.1.96 The extent to which these effects would occur depends on a number of wider factors. The most important amongst these include the level and type of support for the growth of these sectors locally, the availability of appropriate finance to support business growth and start up, the level and nature of inward investment activity that occurs and wider economic conditions. The scale of wider renewables sector development activity across each of the Local Study Areas (led largely by the respective LEPs) suggests that the potential for local benefits to be captured and used to stimulate wider sector growth will be maximised.

10.11.1.97 Given that the construction period would be time limited, it is not likely that these effects would take place as a result of Hornsea Three alone. It is more likely that Hornsea Three's construction could play a role in increasing the overall size of the market for these sectors in the local economic development study areas alongside other developments and investments in the area. The scale of the role that Hornsea Three would play here is assessed more fully in the assessment of cumulative impact (see section 10.13).

New Anglia LEP Local Economic Development Study Area

Magnitude of impact:

10.11.1.98 It is unlikely that any of the scenarios alone would deliver sufficient additional economic activity to stimulate these catalytic effects. The assessment of magnitude does however need to reflect the contribution that Hornsea Three would make to the overall scale of activity in the sector locally.

10.11.1.99 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore considered to be negligible for the low and medium impact scenarios.

Sensitivity of receptor

10.11.1.100 Across the New Anglia local economic development study area, development of the renewable energy sector is central to economic development aims. The New Anglia LEP's strategic plan underlines the importance of the renewable energy sector to achieving the strategic goals for the local economic development study area, creating wealth and employment opportunities locally.

10.11.1.101 In light of the very high profile of the sector within local economic development policy, the receptor is deemed to be of very high value and the sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.1.102 The benefits delivered for the wider renewable energy sector are expected to materialise as a result of the cumulative effects of a number of developments locally, rather than be attributable to a single development (these are considered in section 10.12). However, under the higher impact scenarios where the level of local sourcing is more significant, it is expected that the volume of activity associated with Hornsea Three could underpin and support wider sector growth.

10.11.1.103 The effect will therefore be of **minor beneficial** significance under the low and medium impact scenarios, which is not significant in EIA terms.

Humber LEP Local Economic Development Study Area

Magnitude of impact:

10.11.1.104 The economic impact assessment indicates that the effects of construction of Hornsea Three on the direct employment receptor would be of negligible magnitude in the Humber LEP local economic development study area under the low impact scenario, and high under the medium and high impact scenarios.

10.11.1.105 Given the breadth of factors which contribute to the wider sector benefits occurring, it is unlikely that any of the scenarios alone would deliver sufficient additional economic activity to stimulate these catalytic effects. The assessment of magnitude does however need to reflect the contribution that Hornsea Three would make to the overall scale of activity in the sector locally.

10.11.1.106 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore considered to be negligible for the low impact scenario, minor beneficial for the medium scenario, and moderate beneficial for the high impact scenario.

Sensitivity of receptor

10.11.1.107 Across the Humber local economic development study area, development of the renewable energy sector is central to economic development aims. The Humber LEP's strategic plan underlines the importance of the renewable energy sector to achieving the strategic goals for the local economic development study area, creating wealth and employment opportunities locally.

10.11.1.108 In light of the very high profile of the sector within local economic development policy, the receptor is deemed to be of very high value and the sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.1.109 The benefits delivered for the wider renewable energy sector are expected to materialise as a result of the cumulative effects of a number of developments locally, rather than be attributable to a single development. However, under the higher impact scenarios where the level of local sourcing is more significant, it is expected that the volume of activity associated with Hornsea Three could underpin and support wider sector growth.

10.11.1.110 The effect will therefore be of **minor beneficial** significance under the low and medium impact scenarios, which is not significant in EIA terms.

10.11.1.111 In light of the greater magnitude of change expected under the high impact scenario, the effect here is expected to be of **moderate beneficial** significance, which is significant in EIA terms.

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

Tourism and Recreation Study Area

Magnitude of impact:

10.11.1.112 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 (e.g. water sports).

10.11.1.113 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;
- The obstructions and disruptions to onshore and offshore recreational activities occurring as a result of construction activities (for example, cruising routes in and around the construction site); and
- Disruptions to transport routes affecting accessibility for tourist visitors.

- 10.11.1.114 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. In assessing the outlined impacts, this chapter draws on the results of assessment from chapter 4: Landscape and Visual Resources, chapter 8: Noise and Vibration, and chapter 7: Traffic and Transport. The results therefore reflect the post-mitigation effects, taking account of the Outline Code of Construction Practice (document reference A8.5), Outline Landscape Management Plan (document reference A8.7), and the Outline Construction Traffic Management Plan (document reference A8.2) which have been adopted as part of Hornsea Three.
- 10.11.1.115 Visual impacts may affect tourism activity in a number of ways. Given the distance of Hornsea Three from shore, the offshore infrastructure construction activity is unlikely to have a material impact on visual amenity of the LEP, therefore the main considerations are focused on the onshore construction works. The resulting impact of visual effects on tourism will depend on the proximity of construction activity to tourism areas. For example, presence of machinery and construction works which are visible to tourists may affect the perception or attractiveness of area.
- 10.11.1.116 The visual impact of construction is assessed fully in chapter 4: Landscape and Visual Resources. The assessment did not identify any significance effects on visual receptors during construction. Any insignificant effects which may occur are expected to be of temporary short-term duration. The analysis found that routes such as England Coastal Paths (which are likely to be visited by tourists) would not experience any significant changes in landscape and visual resources. Therefore, the assessment of Hornsea Three construction on tourism activity concludes that there would be no change in visual amenity, and therefore would not deter or displace tourist visitors into the tourism and recreation study area.
- 10.11.1.117 Noise and vibration impacts during construction have the potential to affect tourism activity if significant effects are experienced in close proximity to visitors or visitor locations. The noise and vibration impacts are assessed fully in chapter 8: Noise and Vibration. The chapter did not identify any significant noise and vibration effects from construction of Hornsea Three. Indeed, all effects during construction are expected to be of negligible to minor significance. Therefore, the assessment of construction of Hornsea Three on tourism cannot conclude that the activity will result in any disruptions to tourism activity.
- 10.11.1.118 Another consideration is the disruption to transport routes frequented by visitors. For example, congestion and delays on roads used by tourists as a result of increased heavy goods vehicle movements needed for the construction of Hornsea Three may create a perception among tourists that the area is more difficult to access. This could deter visitors from the area, in turn affecting economic value. The effects on transport routes are assessed fully in chapter 7: Traffic and Transport. The assessment did not identify any significant effects resulting from construction of Hornsea Three on traffic and transport. Any delays which might be caused during transportation of large loads on roads are expected to be limited. As before, there is little evidence that effect of construction of Hornsea Three on transport and traffic will have any impact on tourism activity and associated value.
- 10.11.1.119 The combination of factors suggests that the extent to which the construction of Hornsea Three affects tourism will be limited. Moreover, any temporary disruptions that are caused during the construction activity onshore are confined to a small area, which in the context of tourism across the tourism and recreation study area is very small. 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 and recreation study area.
- 10.11.1.120 The impact on offshore and coastal tourism and associated economic value is expected to be negligible.
- Sensitivity of receptor*
- 10.11.1.121 Tourism is an important sector across the tourism and recreation study 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 economic development study area than nationally).
- 10.11.1.122 There is particularly a notable concentration of tourism employment within the district of North Norfolk, where tourism employment accounts for 18% 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.
- 10.11.1.123 The receptor is therefore deemed to be of high value, in light of this concentration that exists within the tourism and recreation study Area, and particularly North Norfolk. The sensitivity of the receptor is therefore considered to be high.
- Significance of the effect*
- 10.11.1.124 In light of the limited magnitude of effects on recreational resources, visual and noise receptors, and limited disruptions to traffic and transport, 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 and Recreation Study Area
- Magnitude of impact:*
- 10.11.1.125 The areas where there may potentially be disruption to local tourism and recreational resources (including PRoW) are limited to those where the onshore infrastructure (the Hornsea Three onshore cable corridor and onshore HVDC converter/HVAC substation and onshore HVAC booster station, as well as storage areas and accesses) would be present.
- 10.11.1.126 The visual impact of the construction of onshore infrastructure on receptors using PRoW is assessed in chapter 4: Landscape and Visual Resources. The main recreational routes within the assessment which

are used by visitors include Peddars Way and Norfolk Coastal Path, which may require some temporary diversion of routes. The assessment of visual effects on users of these routes is expected to be of limited spatial extent, short term duration and reversible. The assessment therefore concluded that there would be no significant visual effects for users of Peddars Way / Norfolk Coastal Path (or any other routes).

10.11.1.127 The impacts of construction on PRoW are assessed fully in chapter 6: Land Use and Recreation. The main considerations which are relevant to effects on tourism visitors and recreational resources relate to national PRoW (such as the Peddars Way/Norfolk Coastal Path) and visitor resources. The national PRoW may need to be temporarily diverted for parts of the route. The visitor resources which lie in proximity to the onshore construction activities would remain available to visitors. The assessment concluded that the temporary effects on Peddars Way and Norfolk Coastal Path may be significant.

10.11.1.128 While there are some disruptions identified to PRoW, in the context of the tourism and recreation study area, they would affect a very small number of visitors. Any disruptions would 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 and recreation study 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.

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

Sensitivity of receptor

10.11.1.130 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

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

Future monitoring

10.11.1.132 No socio-economic and tourism monitoring to test the predictions made within the construction phase is considered necessary.

10.11.2 Operation and maintenance phase

10.11.2.1 The impacts of the onshore and offshore O&M of Hornsea Three have been assessed on socio-economics. The potential impacts arising from the O&M of Hornsea Three are listed in Table 10.30, along with the maximum design scenario against which each O&M phase impact has been assessed.

10.11.2.2 A description of the potential significance of effects on socioeconomic receptors caused by each identified impact is given below.

The operation and maintenance of Hornsea Three may have an impact on employment in operation and maintenance and in the supply chain.

10.11.2.3 The level of employment supported during the O&M phase is driven not simply by the number of direct employees required by Hornsea Three to support O&M, but also by the level of expenditure on materials, spares, transportation and other supplies, and the cost of any sub-contracted maintenance activities.

10.11.2.4 As for the construction phase, the level of economic impacts that is secured depends on the geographical distribution of O&M supply chain expenditure, as well as the location of the posts created directly by the Applicant to fulfil O&M requirements.

UK Economic Development Study Area

Magnitude of impact

10.11.2.5 Table 10.60 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the O&M phase throughout the UK.

Table 10.60: Summary of estimated levels of employment during O&M phase for the UK Economic Development Study Area.

| Impact type | Annual employment during O&M |
|--------------|------------------------------|
| | Baseline Scenario |
| Direct | 120 |
| Indirect | 1,170 |
| Total | 1,290 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.2.6 The potential employment impact could be around 1,250 FTE jobs per year under the baseline O&M impact scenario. This includes the direct and supply chain employment impacts.

10.11.2.7 The direct employment impact would be around 120 FTEs, as it is assumed that all direct O&M employment would be UK based. As these positions would be directly employed by Hornsea Three, all of these would be within the electric power generation sector (SIC 351). As set out in the baseline section of this report, the electricity generation sector currently supports just under 76,000 FTE positions nationally. The addition of 120 FTE posts across the UK would have a small impact on the level of employment in this sector nationally (the percentage increase would be less than 0.01%).

10.11.2.8 It can reasonably be expected that the indirect employment effects would be focused on a smaller number of sectors than during the construction phase, as activities would be related primarily to (i) manufacture and installation of spare components (ii) engineering activities associated with maintenance and (iii) land and marine transport of components. The main sectors considered in this assessment have therefore been limited to the following:

- Relevant manufacturing and engineering sectors – to service requirements for replacement components as and when required. As for the construction sector, the focus of effects here would be on manufacture of fabricated metal products, electric motors, wiring, machinery, engines and turbines;
- Specialist construction sectors – to fulfil any sub-contracted maintenance activities that are not dealt with by direct employees of Hornsea Three. The specialist construction sectors of construction of civil engineering projects and building of ships, boats and floating structures would be the focus for benefits in the construction sector;
- Marine and land transport sectors – to transport components and / or employees out to Hornsea Three site for maintenance activities; and
- Professional services – to provide any technical sub-contracted services to Hornsea Three, for example remote monitoring etc.

10.11.2.9 These sectors together support 1.8 million FTE positions nationally. The annual indirect employment impact of 1,170 FTEs would represent less than 0.01% of the employment in these sectors nationally and therefore have no discernible impact on overall levels of employment.

10.11.2.10 Given that the percentage changes in employment in relevant sectors for direct and indirect effects would be so low, it is not expected that the O&M phase of Hornsea Three would lead to a noticeable change in baseline conditions in the UK economic development study area.

10.11.2.11 The impact is predicted to be of national spatial extent, long term duration and continuous. It is predicted that the impact would affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of receptor

10.11.2.12 The assessment of sensitivity of the receptor during the O&M phase is based on the same evidence as the construction phase of Hornsea Three (see paragraphs 10.11.1.10 to 10.11.1.12).

10.11.2.13 The O&M employment receptor is therefore deemed to be of high value and high vulnerability, and thus the sensitivity of the receptor is high.

Significance of the effect

10.11.2.14 The significance of effect on this receptor is driven by the sensitivity of the receptor, rather than the magnitude of change. In light of the negligible magnitude of change, the significance of effect is therefore expected to be **minor beneficial**, which is not significant in EIA terms.

New Anglia LEP Local Economic Development Study Area

Magnitude of impact:

10.11.2.15 Table 10.61 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the O&M phase in the New Anglia LEP local economic development study area.

Table 10.61: Summary of estimated levels of employment during O&M phase for the New Anglia LEP Local Economic Development Study Areas.

| Impact type | Annual employment during O&M | |
|--------------|------------------------------|---------------|
| | Low scenario | High Scenario |
| Direct | 0 | 120 |
| Indirect | 3 | 500 |
| Total | 3 | 620 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.2.16 The potential employment impact ranges from 3 to 620 FTE jobs per year under the low and high O&M impact scenarios respectively. This includes the direct and supply chain employment impacts.

10.11.2.17 As with the UK, the direct employment impact under the low scenario does not generate direct jobs, as the O&M port is assumed to be based outside of the UK.

10.11.2.18 The direct employment impact under the high scenario would be 120 FTEs, as it is assumed that all direct O&M employment would be based in New Anglia. As these roles would be directly employed by Hornsea Three, all of these would be within the electric power generation sector (SIC 351). As set out in the baseline section of this report, the electricity generation sector currently supports around 2,900 FTE jobs in New Anglia. The addition of 120 FTE posts in New Anglia cause a 4% uplift to the level of employment in this sector.

10.11.2.19 Indirect employment would be focused on the same sectors outlined under the assessment of the receptor for the UK economic development study area. Within the New Anglia local economic development study area, these sectors support 39,000 FTEs. The maximum indirect annual employment effect during the O&M phase would have a small effect on the baseline level of employment within these sectors. The maximum increase would be 1.6% under the high impact scenario.

10.11.2.20 The direct employment generated within the New Anglia local economic development study area under the high scenarios would have a very noticeable impact on the size of the energy sector locally. The indirect impacts under the high scenario are less likely to be noticeable.

10.11.2.21 The impact is predicted to be of local spatial extent, long term in duration and continuous. It is predicted that the impact will affect the receptor directly. The new O&M jobs which are contracted directly to the Applicant (i.e. the direct impact) will represent a sizeable uplift on the current baseline level of employment in the electric power generation sector locally, while the wider indirect impacts will lead to a noticeable change in baseline conditions under the high scenario. The magnitude is therefore considered to be negligible for the low impact scenario, and major for the high impact scenario.

Sensitivity of receptor

10.11.2.22 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.21 to 10.11.1.22).

10.11.2.23 The O&M employment receptor is deemed to be of high value and high vulnerability and as a result, the sensitivity of the receptor in the local economic development study area is considered to be high.

Significance of the effect

10.11.2.24 The significance of effect is driven primarily by the sensitivity of the receptor rather than the magnitude of the impact. In comparison to the baseline level of employment in key sectors locally, the magnitude of impacts expected under the low impact scenario would deliver barely any change. The effect will therefore, be of **minor beneficial** significance, which is not significant in EIA terms.

10.11.2.25 The larger magnitude expected under the high scenario means that, the effects would be of **major beneficial** significance, which is significant in EIA terms.

Humber LEP Local Economic Development Study Area

Magnitude of impact:

10.11.2.26 Table 10.62 sets out the estimated levels of direct and indirect employment that Hornsea Three could support during the O&M phase in the Humber LEP local economic development study area.

Table 10.62: Summary of estimated levels of employment during O&M phase for the Humber LEP Local Economic Development Study Area.

| Impact type | Annual employment during O&M | |
|--------------|------------------------------|---------------|
| | Low scenario | High Scenario |
| Direct | 0 | 120 |
| Indirect | 3 | 500 |
| Total | 3 | 620 |

Note: Sourcing assumptions underpinning the impact analysis were made by Regeneris Consulting in consultation with the Applicant. Figures may not sum due to rounding.

10.11.2.27 The potential employment impact ranges from 3 to 1,100 FTE jobs per year under the low and high O&M impact scenarios respectively. This includes the direct and supply chain employment impacts.

10.11.2.28 As with the UK, the direct employment impact under the low scenario does not generate direct jobs, as the O&M port is assumed to be based outside of the UK.

10.11.2.29 The direct employment impact under the high scenario would be 120 FTEs, as it is assumed that all direct O&M employment would be based in Humber. As these roles would be directly employed by Hornsea Three, all of these would be within the electric power generation sector (SIC 351). As set out in the baseline section of this report, the electricity generation sector currently supports around 1,000 FTE jobs in the Humber. The addition of 120 FTE posts in the Humber would have a significant impact on the level of employment in this sector, equivalent to 12%.

10.11.2.30 Indirect employment would be focused on the same sectors outlined under the assessment of the receptor for the UK economic development study area. Within the Humber local economic development study area, these sectors support 24,000 FTEs. The maximum increase would be noticeable 2% under the high impact scenario.

10.11.2.31 The direct employment generated within the Humber local economic development study area under the high scenarios would have a very noticeable impact on the size of the energy sector locally, although this would be driven to some extent by the limited size of the sector locally. The indirect impacts under the high scenario are likely to also be noticeable.

10.11.2.32 The impact is predicted to be of local spatial extent, long term in duration and continuous. It is predicted that the impact will affect the receptor directly. The new O&M jobs which are contracted directly to the Applicant (i.e. the direct impact) will represent a sizeable uplift on the current baseline level of employment in the electric power generation sector locally, while the wider indirect impacts will lead to a noticeable change in baseline conditions under the high scenario. The magnitude is therefore considered to be negligible for the low impact scenario, and major for the high impact scenario.

Sensitivity of receptor

10.11.2.33 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.30 to 10.11.1.31).

10.11.2.34 The O&M employment receptor is deemed to be of high value and high vulnerability and as a result, the sensitivity of the receptor in the local economic development study area is considered to be high.

Significance of the effect

10.11.2.35 The significance of effect is driven primarily by the sensitivity of the receptor rather than the magnitude of the impact. In comparison to the baseline level of employment in key sectors locally, the magnitude of impacts expected under the low impact scenario would deliver barely any change. The effect will therefore, be of **minor beneficial** significance, which is not significant in EIA terms.

10.11.2.36 The larger magnitude expected under the high scenario means that, the effects would be of **major beneficial** significance, which is significant in EIA terms.

The operation and maintenance of Hornsea Three may have an impact on amount of GVA supported by operation and maintenance activity.

UK Economic Development Study Area

Magnitude of impact:

10.11.2.37 Table 10.63 sets out the estimated levels of direct and indirect GVA that Hornsea Three could support during the O&M phase throughout the UK.

Table 10.63: Summary of O&M phase GVA impact for the UK Economic Development Study Area.

| Impact type | GVA (£millions) | |
|--------------|-------------------|--|
| | Baseline Scenario | |
| Direct | 20 | |
| Indirect | 70 | |
| Total | 90 | |

Note: Impact calculations by Regeneris Consulting. Figures may not sum due to rounding.

10.11.2.38 The potential GVA impact could be around £90 million in annual GVA. This includes the direct and supply chain employment impacts.

10.11.2.39 The most recent estimate of UK GVA is £1,670 billion. The annual GVA created across the UK as a result of the O&M of Hornsea Three would therefore deliver no discernible change on baseline conditions.

10.11.2.40 The impact is predicted to be of national spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore considered to be negligible.

Sensitivity of receptor

10.11.2.41 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.38 to 10.11.1.39).

10.11.2.42 The O&M GVA receptor is deemed to be of high value and moderate vulnerability. The sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.43 The high sensitivity of the receptor amplifies the significance of an impact of relatively small magnitude for this receptor. For all impact scenarios, the effect will be of **minor beneficial** significance, which is not significant in EIA terms.

New Anglia Local Economic Development Study Area

Magnitude of impact:

10.11.2.44 Table 10.64 sets out the estimated levels of direct and indirect GVA that Hornsea Three could support during the O&M phase for the New Anglia local economic development study area.

Table 10.64: Summary of O&M phase GVA impact for the New Anglia Local Economic Development Study Area.

| Impact type | GVA (£millions) | |
|--------------|-----------------|---------------|
| | Low scenario | High Scenario |
| Direct | 0 | 20 |
| Indirect | 0 | 30 |
| Total | 0 | 50 |

Note: Impact calculations by Regeneris Consulting. Figures may not sum due to rounding.

10.11.2.45 The potential GVA impact ranges from 0 to £50 million in annual GVA under the low and high O&M impact scenarios respectively. This includes the direct and supply chain employment impacts. Given the current level of GVA in New Anglia local economic development study area is £35 billion, the low scenario would deliver no change in the baseline level of GVA. The high scenario is estimated to amount to 0.1% of increase from the baseline level.

10.11.2.46 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be of no change for the low impact scenario, and negligible for the high scenario.

Sensitivity of receptor

10.11.2.47 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.45 to 10.11.1.46).

10.11.2.48 The O&M GVA receptor is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.49 Impacts on this receptor are driven by the high sensitivity of the receptor. For the low impact scenario, there is no evident change in the overall magnitude of the local GVA, so the effect will be of **negligible** significance, which is not significant in EIA terms. The greater magnitude of impact expected under the high impact scenario means that the effect would be of **minor beneficial** significance, which is not significant in EIA terms.

Humber Local Economic Development Study Area

Magnitude of impact:

10.11.2.50 Table 10.65 sets out the estimated levels of direct and indirect GVA that Hornsea Three could support during the O&M phase for the Humber local economic development study area.

Table 10.65: Summary of O&M phase GVA impact for the Humber Local Economic Development Study Area.

| Impact type | GVA (£millions) | |
|--------------|-----------------|---------------|
| | Low scenario | High Scenario |
| Direct | 0 | 20 |
| Indirect | 0 | 30 |
| Total | 0 | 50 |

Note: Impact calculations by Regeneris Consulting. Figures may not sum due to rounding.

10.11.2.51 The potential GVA impact ranges from 0 to £50 million in annual GVA under the low and high O&M impact scenarios respectively. This includes the direct and supply chain employment impacts. Given the current level of GVA in Humber local economic development study area is £17.8 billion, the low scenario would deliver no change in the baseline level of GVA. The high scenario is estimated to amount to 0.3% of increase from the baseline level.

10.11.2.52 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be no change for the low scenario and minor for the high impact scenario.

Sensitivity of receptor

10.11.2.53 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.52 to 10.11.1.53).

10.11.2.54 The O&M GVA receptor is deemed to be of high value and high vulnerability. The sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.55 Impacts on this receptor are driven by the high sensitivity of the receptor. For the low impact scenario, there is no evident change in the overall magnitude of the local GVA, so the effect will be of **negligible** significance, which is not significant in EIA terms. The greater magnitude of impact expected under the high impact scenario means that the effect would be of **moderate beneficial** significance, which is not significant in EIA terms.

The operation and maintenance of Hornsea Three may have an impact on access to operation and maintenance related employment amongst local residents.

10.11.2.56 The potential for local people to access employment opportunities created as a result of the O&M of Hornsea Three is dependent on the location of the O&M bases and the match between the type of employment created and the skills and occupational profile of the local residents.

10.11.2.57 It can reasonably be expected that the direct and indirect effects would be focused on a smaller number of sectors than during the construction phase as activities would be related primarily to (i) manufacture and installation of spare components (ii) engineering activities associated with maintenance and (iii) land and marine transport of components. The main sectors considered in this assessment have therefore been limited to selected manufacturing and engineering, specialist construction, marine and land transport and technical professional services.

10.11.2.58 The approach to assessing the magnitude of impact on access to O&M related employment amongst local residents has been assessed on the same basis as for the construction section of this chapter. Therefore, the assessment is based on:

- The existing concentrations of employment in relevant sectors (and therefore the likelihood that there is sufficient capability and capacity in the sector locally to capture O&M related opportunities);
- The level of relevant capacity in the local labour market, measured by the number of unemployed people seeking employment in occupations relevant to sectors likely to benefit from O&M related employment impacts. The estimated employment impact cannot be broken down into detailed sectors. However, cross referencing the sectors to occupational groups provides an indication of the likely relevance of the skills of people in the local labour force that are available for work, based on the type of occupations they are seeking; and
- The overall impact of the employment created on the baseline level of people seeking employment in relevant sectors.

New Anglia LEP Local Economic Development Study Area

Magnitude of impact:

10.11.2.59 The low impact scenario would deliver very modest levels of direct and indirect O&M related employment locally, which would have no noticeable effect on the baseline level of employment in the New Anglia local economic development study area.

10.11.2.60 However, the direct and indirect employment effects delivered by the high impact scenario would create a more substantial level of employment locally of 620 FTE jobs (see paragraph 10.11.2.16).

10.11.2.61 The existing level of capacity within the local labour market (using the number of unemployed residents seeking employment in the New Anglia local economic development study area) shows that the addition of these jobs would be a valuable contribution to the local economy. Moreover, the employment opportunities associated with O&M tend to be high skill and high value.

10.11.2.62 The socio-economic baseline highlighted some capacity within the labour market locally; there are 33,000 unemployed residents across the New Anglia LEP local economic development study area (see paragraph 10.7.2.11). Of these, there are 14,200 claimants actively seeking work (see paragraph 0). Under the high impact scenario, the employment created would amount to 4% of claimants (under the low scenario the employment created would create no change to baseline conditions).

10.11.2.63 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is considered to be of no change for the low impact scenario, and major for the high impact scenario.

Sensitivity of receptor

10.11.2.64 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.75 to 10.11.1.77).

10.11.2.65 The O&M GVA receptor is deemed to be of high value. The sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.66 The significance of effects on this receptor is driven by the high sensitivity of the receptor. In the context of the number of people seeking employment locally, the employment created during O&M in the low scenario is not sufficient to stimulate a discernible change in baseline conditions. The effect will therefore be of **negligible** significance, which is not significant in EIA terms.

10.11.2.67 In the high impact scenario the effect could be of **major beneficial** significance, which is significant in EIA terms.

Humber LEP Local Economic Development Study Area

Magnitude of impact:

10.11.2.68 The low impact scenario would deliver very modest levels of direct and indirect O&M related employment locally, which would have no noticeable effect on the baseline level of employment in the Humber local economic development study area.

10.11.2.69 However, the direct and indirect employment effects delivered by the high impact scenario would create a more substantial level of employment locally of 620 FTE jobs (see paragraph 10.11.2.85).

10.11.2.70 The existing level of capacity within the local labour market (using the number of unemployed residents seeking employment in the Humber local economic development study area), suggests that the jobs created through O&M of Hornsea Three would make a valuable contribution to the local economy. Moreover, the employment opportunities associated with O&M tend to be high skill and high value.

10.11.2.71 The socio-economic baseline highlighted some capacity within the labour market locally; there are 24,000 unemployed residents across the Humber LEP local economic development study area. Of these, there are 14,800 claimants actively seeking work. Under the high impact scenario, the employment created would represent 4% of claimants (under the low scenario the employment created would create no change to baseline conditions).

10.11.2.72 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is considered to be no change for the low impact scenario, and major for the high impact scenario.

Sensitivity of receptor

10.11.2.73 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.75 to 10.11.1.77).

10.11.2.74 The O&M GVA receptor is deemed to be of high value. The sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.75 The significance of effects on this receptor is driven by the very high sensitivity of the receptor. In the context of the number of people seeking employment locally, the employment created during O&M in the low scenario does not stimulate visible change in baseline conditions. The effect will therefore be of **negligible** significance, which is not significant in EIA terms.

10.11.2.76 In the high impact scenario, the effect could be of **major beneficial** significance, which is significant in EIA terms.

The operation and maintenance of Hornsea Three may have an impact on demand for housing, accommodation and local services in the Local Economic Development Study Area.

10.11.2.77 As for the construction assessment, the impact of the O&M phase of Hornsea Three on the demand for housing and other services is dependent on the number of direct and indirect jobs that this activity generates and the extent to which the workforce is drawn locally.

10.11.2.78 In addition, the magnitude of the effect of the employment impact associated with O&M on demand for housing, accommodation and other local services depends on:

- The proportion of O&M activity that is outsourced and the associated geography of the O&M supply chain. It is not possible at this stage to confidently assess which supply chain activities would be taken up by firms located outside of the Humber LEP local economic development study area

(which may draw on their own labour force located elsewhere) and what proportion could be captured by local suppliers (which would increase demand for labour locally and have an impact on demand for housing and services). The impact scenarios provide an estimation of direct and indirect O&M employment, which can be used to guide the assessment of the scale of impact here; and

- The proportion of jobs permanently located at the O&M base. These permanent posts would only have an impact on the demand for housing and services if there was significant in migration to fulfil requirements.

10.11.2.79 Given that it is difficult at this stage to confidently predict the level of increased demand, the assessment has been based on a maximum design scenario i.e. that all employment requirements in the local economic development study area are fulfilled by people from outside of the area. While the maximum design scenario is very unlikely to materialise (particularly in light of the capacity that exists in the local labour market), this cautious assessment reflects the uncertainty associated with this element of the analysis.

New Anglia LEP Local Economic Development Study Area

Magnitude of Impact:

10.11.2.80 The total direct and indirect employment impacts range from very limited employment creation under the low impact scenario to 620 FTEs for the high impact scenario. Assuming that all of this additional employment is taken by people from outside of the local economic development study area (which is very unlikely given current labour market conditions locally), the resultant increase in population under the highest impact scenario would represent an increase of less than 0.04% in the population of the New Anglia LEP local economic development study area. Whether the resultant population increase is temporary or permanent, this would have a negligible impact on the demand for housing, accommodation and services locally.

10.11.2.81 In the context of the local population the potential increase occurring as a result of the Hornsea Three is minimal (especially bearing in mind that a proportion of the jobs are likely to be filled by people already living in the areas). The impact is predicted to be of local spatial extent, long term in duration and intermittent. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore considered to be negligible.

Sensitivity of receptor

10.11.2.82 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.2.82 to 10.11.2.83).

10.11.2.83 The receptor is deemed to be of medium value and vulnerability. The sensitivity of the receptor is therefore considered to be medium.

Significance of the effect

10.11.2.84 As a result of the small magnitude of impact, the effect will therefore be of **negligible** significance, which is not significant in EIA terms.

Humber LEP Local Economic Development Study Area

Magnitude of Impact:

10.11.2.85 The total direct and indirect employment impacts range from very limited employment creation under the low impact scenario to 620 FTEs for the high impact scenario. Assuming that all of this additional employment is taken by people from outside of the local economic development study area, the resultant increase in population under the highest impact scenario would represent an increase of less than 0.1% in the population of the Humber LEP local economic development study area. Whether the resultant population increase is temporary or permanent, this would have a negligible impact on the demand for housing, accommodation and services locally.

10.11.2.86 In the context of the local population the potential increase occurring as a result of the Hornsea Three is minimal (especially bearing in mind that a proportion of the jobs are likely to be filled by people already living in the areas). The impact is predicted to be of local spatial extent, long term in duration and intermittent. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore considered to be negligible.

Sensitivity of receptor

10.11.2.87 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.89 to 10.11.1.90).

10.11.2.88 The receptor is deemed to be of medium value and vulnerability. The sensitivity of the receptor is therefore considered to be medium.

Significance of the effect

10.11.2.89 As a result of the negligible magnitude of impact and the medium sensitivity of the receptor the effect will therefore be of **negligible** significance, which is not significant in EIA terms.

The operation and maintenance of Hornsea Three may have an impact on the performance of the renewable energy sector.

10.11.2.90 The O&M phase of Hornsea Three would impact on the wider performance of the renewable energy sector in much the same way as the construction phase would. The additional economic activity arising through the O&M of Hornsea Three could give rise to catalytic effects which could stimulate improved performance in the renewables sector locally.

10.11.2.91 While the scale of the injection of economic activity into the local economy would be more modest for than in the construction phase, it would be sustained over a much longer period, and may therefore provide a more solid foundation for growth in the sector locally.

New Anglia LEP Local Economic Development Study Area

Magnitude of impact

10.11.2.92 The overall scale of employment impacts delivered during the O&M phase are relatively modest in the context of the wider size of the renewable energy sector locally under both, the low and medium impact scenarios. As for the construction phase, the magnitude of impact on the sector more broadly taking Hornsea Three in isolation is limited, although Hornsea Three's role in securing wider benefits is considered more fully in the assessment of cumulative impacts (see Section 10.13).

10.11.2.93 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Sensitivity of receptor

10.11.2.94 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.2.94 to 10.11.2.95).

10.11.2.95 In light of the very high profile of the sector within local economic development policy, the receptor is deemed to be of very high value and the sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.96 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

Humber LEP Local Economic Development Study Area

Magnitude of impact

10.11.2.97 The overall scale of employment impacts delivered during the O&M phase are relatively modest in the context of the wider size of the renewable energy sector locally, even for the highest impact scenario. As for the construction phase, the magnitude of impact on the sector more broadly taking Hornsea Three in isolation is limited, although Hornsea Three's role in securing wider benefits is considered more fully in the assessment of cumulative impacts (see Section 10.13).

10.11.2.98 The impact is predicted to be of local spatial extent, long term duration and continuous. It is predicted that the impact will affect the receptor indirectly. The magnitude is therefore, considered to be negligible.

Sensitivity of receptor

10.11.2.99 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.107 to 10.11.1.108).

10.11.2.100 In light of the very high profile of the sector within local economic development policy, the receptor is deemed to be of very high value and the sensitivity of the receptor is therefore considered to be high.

Significance of the effect

10.11.2.101 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

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 economic development study area.

Magnitude of impact

10.11.2.102 The O&M phase of Hornsea Three could potentially stimulate impacts on onshore coastal tourism and recreation activity and associated economic value in a similar way to the construction phase, with effects primarily related to visual impacts associated with the O&M activity, noise and vibrations impacts associated with the O&M activity; and disruptions to onshore and offshore recreational activities occurring as a result of O&M activities.

10.11.2.103 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 O&M. It should be noted that the O&M activity occurring onshore would be of much smaller scale compared to construction activities. There would be some periodic maintenance of the onshore cable route, and the permanent presence of the substations.

10.11.2.104 Visual effects of offshore infrastructure are very limited from most onshore locations, given the distance of Hornsea Three from the shore, and would not be expected to have an impact on visitors. The visual impacts of the onshore infrastructure during O&M phase is assessed fully in chapter 4: Landscape and Visual Resources. 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.

10.11.2.105 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.

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

10.11.2.107 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

10.11.2.108 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraphs 10.11.1.112 to 10.11.1.124).

10.11.2.109 The receptor is therefore considered to be of high sensitivity.

Significance of the effect

10.11.2.110 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 and Recreation Study Area

Magnitude of impact

10.11.2.111 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.

10.11.2.112 Visual impacts associated with onshore infrastructure are outlined in chapter 4: Landscape and Visual Resources. The assessment concludes that 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.

10.11.2.113 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

10.11.2.114 The evidence underpinning the assessment of the sensitivity of the receptor is as for the construction phase (see paragraph 10.11.1.130).

10.11.2.115 The receptor is therefore considered to be of high sensitivity.

Significance of the effect

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

Future monitoring

10.11.2.117 No socio-economic and tourism monitoring to test the predictions made within the operation and maintenance phase is considered necessary.

10.11.3 Decommissioning phase

10.11.3.1 The impacts of the onshore and offshore decommissioning of Hornsea Three have been assessed on socio-economics. The potential impacts arising from the decommissioning of Hornsea Three are listed in Table 10.30, along with the maximum design scenario against which each decommissioning phase impact has been assessed.

10.11.3.2 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.

10.11.3.3 The exact nature of the work required will depend on the planning requirements attached to Hornsea Three and is therefore likely to vary. The approach to decommissioning will be reviewed in a Decommissioning Plan which will be prepared for Hornsea Three, in line with the requirements of the Energy Act 2004.

10.11.3.4 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 economic development study area, although it is very difficult to predict the level of local supply chain involvement at this stage.

10.11.3.5 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.

10.11.3.6 A description of the potential effect on socio-economic receptors caused by each identified impact is given below.

Impacts of decommissioning may have an impact on decommissioning related employment

10.11.3.7 There are a number of activities that would be associated with the decommissioning of Hornsea Three after its 35 year O&M period. These are likely to be comparable to some of the activities during the construction phase. The average decommissioning cost (based on recent evidence) as shown in Table 10.66 is around £83,620 per MW of installed capacity.

Table 10.66: Offshore wind farm decommissioning cost examples.

| Offshore Wind Farm | Example Capacity | Cost per MW |
|----------------------|------------------|---|
| Cape Wind (USA): Min | 468 MW | USD\$100,000 - \$140,000 (c. £65,000 - £100,500)* |
| Cape Wind (USA): Max | 468 MW | USD \$140,000 (c. £91,000)* |
| Lincs (UK) | 270 MW | £101,193 |
| Average (£s) | - | £83,620 |

Sources: Cape Wind - Kaiser M and Snyder B (2010). Lincs – RPS (2010). * Conversion to pound sterling is indicatively based on the average exchange rate in 2010.

UK Impact Area

Magnitude of impact:

- 10.11.3.8 The average decommissioning cost of around £80,000 per MW points towards a total cost for decommissioning of £192 million based on the technology available today and current costs of decommissioning.
- 10.11.3.9 This level of investment could support in the region of 2,880 person years of employment in total. This estimate has been derived using benchmark labour coefficients for the infrastructure sector published by the Department for Communities and Local Government of 15 FTEs per £1 million capital spend on infrastructure projects. The type of skills which will be needed and the locations of contractors which can provide these skills is comparable to those during construction. It is therefore reasonable to assume that given the current supply chain capabilities in the UK, between c. 30% and 40% of this value could be retained. This would equate to between 870 and 1,150 person years of employment nationally.
- 10.11.3.10 In the context of the national employment level of 25 million FTEs, an impact of this size would be of negligible magnitude.

Sensitivity of receptor

- 10.11.3.11 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

- 10.11.3.12 The effect will, therefore, be of **minor beneficial** significance, which is not significant in EIA terms.

New Anglia LEP Local Impact Area

Magnitude of impact:

- 10.11.3.13 Expectations in relation to sourcing during the construction phase suggest New Anglia Local Impact Area could reasonably be expected to capture between 1% and 6% of the decommissioning activity.
- 10.11.3.14 This would equate to an employment impact of between 30 person years and 170 person years occurring locally. In the context of the current level of employment in the Local Impact Area, this scale of employment effect is deemed to be of negligible magnitude.

Sensitivity of receptor

- 10.11.3.15 As for the construction sector, the employment receptor is deemed to be of high value and very high vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of effect

- 10.11.3.16 The effect will therefore, be of **minor beneficial** significance, which is not significant in EIA terms.

Humber LEP Local Impact Area

Magnitude of impact:

- 10.11.3.17 It is very difficult to predict how much of the decommissioning activity could be captured by firms within the Local Impact Area. Based on the current supply chain in the area (which is likely to have changed significantly by the time Hornsea Three is decommissioned). Based on expectations in relation to sourcing during the construction phase, the Local Impact Area could reasonably be expected to capture between 1% and 6% of the decommissioning activity.
- 10.11.3.18 This would equate to an employment impact of between 30 person years and 170 person years occurring locally. In the context of the current level of employment in the Local Impact Area, this scale of employment effect is deemed to be of negligible magnitude.

Sensitivity of receptor

- 10.11.3.19 As for the construction sector, the employment receptor is deemed to be of high value and very high vulnerability. The sensitivity of the receptor is therefore, considered to be high.

Significance of effect

- 10.11.3.20 The effect will therefore, be of **minor beneficial** significance, which is not significant in EIA terms.

The decommissioning of Hornsea Three may have an impact on the amount of GVA supported by decommissioning activity.

- 10.11.3.21 The potential effect on economic activity and GVA during the decommissioning phase has been assessed using the same scenario approach as described for the assessment of GVA during construction.

UK Impact Area

Magnitude of Impact:

- 10.11.3.22 Based on the assumptions in relation to decommissioning outlined above, the UK may potentially capture between 30% and 40% of the decommissioning expenditure. The GVA associated with this decommissioning activity would be in the region of £20 to £30 million, which would be of negligible magnitude in the context of national GVA.

Sensitivity of receptor

- 10.11.3.23 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

10.11.3.24 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

New Anglia LEP Local Impact Area

Magnitude of impact:

10.11.3.25 Based on the assumptions in relation to decommissioning outlined above, the GVA associated with decommissioning activity in the Local Impact Area would be between £1 and £5 million. In the context of the current baseline level of GVA in the Local Impact Area, this effect is deemed to be of negligible magnitude.

Sensitivity of receptor

10.11.3.26 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

10.11.3.27 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

Humber LEP Local Impact Area

Magnitude of impact:

10.11.3.28 Based on the assumptions in relation to decommissioning outlined above, the GVA associated with decommissioning activity in the Humber LEP Local Impact Area would be between £1 and £14 million. In the context of the current baseline level of GVA in the Local Impact Area, this effect is deemed to be of negligible magnitude.

Sensitivity of receptor

10.11.3.29 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

10.11.3.30 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

The decommissioning of Hornsea Three may have an impact on access to decommissioning related employment amongst local residents.

New Anglia LEP Local Impact Area

Magnitude of Impact:

10.11.3.31 Given the timing of decommissioning activity, it is impossible to draw firm conclusions about the likely ability of contractors to source the skills they require or the scope for local residents to access employment created as part of decommissioning activity. However, in light of the anticipated small magnitude of the employment impact in the New Anglia LEP Local Impact Area, the overall magnitude of the effects on the access to employment receptor is deemed to be negligible.

Sensitivity of receptor

10.11.3.32 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

10.11.3.33 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

Humber LEP Local Impact Area

Magnitude of Impact:

10.11.3.34 Given the timing of decommissioning activity, it is impossible to draw firm conclusions about the likely ability of contractors to source the skills they require or the scope for local residents to access employment created as part of decommissioning activity. However, in light of the anticipated small magnitude of the employment impact in the Humber LEP Local Impact Area, the overall magnitude of the effects on the access to employment receptor is deemed to be negligible.

Sensitivity of receptor

10.11.3.35 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

10.11.3.36 The effect will therefore be of **minor beneficial** significance, which is not significant in EIA terms.

The decommissioning of Hornsea Three may have an impact on demand for housing, accommodation and local services.

New Anglia LEP Local Impact Area

Magnitude of impact:

10.11.3.37 The scale of activity associated with decommissioning is much less than that which will occur during the construction phase. Given the limited magnitude of employment impacts that this activity is expected to support locally, it is unlikely that the additional demand placed on housing or local services would be unmanageable. The likely effect is therefore assessed to be of negligible magnitude.

Sensitivity of receptor

10.11.3.38 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 medium.

Significance of effect

10.11.3.39 The effect will therefore be of **negligible** significance, which is not significant in EIA terms.

Humber LEP Local Impact Area

Magnitude of impact:

10.11.3.40 The scale of activity associated with decommissioning is much less than that which will occur during the construction phase. Given the limited magnitude of employment impacts that this activity is expected to support locally, it is unlikely that the additional demand placed on housing or local services would be unmanageable. The likely effect is therefore assessed to be of negligible magnitude.

Sensitivity of receptor

10.11.3.41 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 medium.

Significance of effect

10.11.3.42 The effect will therefore be of **negligible** significance, which is not significant in EIA terms.

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

Tourism and Recreation Study Area

Magnitude of Impact:

10.11.3.43 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.

10.11.3.44 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.

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

Sensitivity of receptor

10.11.3.46 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

10.11.3.47 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 and Recreation Study Area

Magnitude of impact:

10.11.3.48 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.

10.11.3.49 Overall, the effects are anticipated to be of negligible magnitude.

Sensitivity of receptor

10.11.3.50 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

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

Future monitoring

10.11.3.52 No socio-economic and tourism monitoring to test the predictions made within the decommissioning phase is considered necessary.

10.12 Cumulative Effect Assessment methodology

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

10.12.1.1 The Cumulative Effect Assessment (CEA) takes into account the impact associated with Hornsea Three together with other projects and plans⁸. 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 annex 5.3: Location of Cumulative 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.

10.12.1.2 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:
 - Those with consent, and, where applicable (i.e. for low carbon electricity generation projects), that have been awarded a Contract for Difference but have not been implemented; 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 project/plans that have consent but, where relevant (i.e. for low carbon electricity generation projects) have no Contract for Difference; and/or
 - Submitted but not yet determined.

⁸ 'Other projects/plans' are major developments as defined in the Town and Country Planning (Development Management Procedure) Order 2010, or as a Nationally Significant Infrastructure project under the Planning Act 2008.

- 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 and the adopted development plan including supplementary planning documents are the most relevant sources of information from the relevant planning authorities regarding planned major works being consulted upon, but not yet the subject of a consent application). Specifically, this Tier includes all projects where the developer has advised PINS in writing that they intend to submit an application in the future, those projects where a Scoping Report is available and/or those projects which have published a PEIR.

10.12.1.3 It is noted that offshore wind farms seek consent for a maximum design scenario and the as built offshore wind farm will be selected from the range of consented scenarios. In addition, the maximum design scenario quoted in the application (and the associated Environmental Statement) are often refined during the determination period of the application. For example, it is noted that the Applicant for Hornsea Project One considered a maximum of 332 turbines within the Environmental Statement, but has gained consent for 240 turbines. Similarly, Hornsea Project Two has gained consent for an overall maximum number of turbines of 300, as opposed to 360 considered in the Environmental Statement and the as built number of turbines is likely to be less than this. A similar pattern of reduction in the project envelope from that assessed in the Environmental Statement, to the consented envelope and the 'as built' project is also seen across other offshore wind farms of relevance to this CEA. This process of refinement can result in a reduction to associated project parameters, for example, the number of cable trenches or the height of onshore substations. The CEA presented in this socioeconomics chapter has been undertaken on the basis of information presented in the Environmental Statements for the other projects, plans and activities. Given that this broadly represents a maximum design scenario, the level of impact on socioeconomics would likely be reduced from those presented here.

10.12.1.4 The specific projects scoped into this CEA and the tiers into which they have been allocated, are outlined in Table 10.67 ordered on the distance of each specific project from Hornsea Three. The projects included as operational in this assessment have been commissioned since the baseline studies for Hornsea Three were undertaken and as such were excluded from the baseline assessment.

Table 10.67: 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 |
|-------------------------------------|--------------------|---|----------------------------------|--|--------------------------------------|---|---|
| Energy - Offshore wind farms | | | | | | | |
| 1 | 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 & Sofia Offshore Wind Farm | 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 407km ² . Hornsea wind farm zone lies approximately 103 km east of the coast of Yorkshire and covers an area of approximately 4735 km ² . 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 | N/A | No | Yes |
| | Operational | LID6 1 | 143 | 6x3.6 MW Siemens turbines | N/A | No | Yes |
| | In Operation | Lincs | 139 | 270 MW | N/A | No | Yes |
| | Operational | Lynn and Inner Dowsing Wind Farms | 147 | 194 MW 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 | 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 Sheringham, Greater Wash 17-23 km off North Norfolk | N/A | No | Yes |
| | Consented | Triton Knoll | 100 | 750-900 MW Greater Wash. 20 miles off the coast of Lincolnshire and 28 miles from the coast of N Norfolk | 2017 - 2021 | Yes | Yes |
| | In Operation | Westermost Rough | 132 | 210 MW | N/A | No | Yes |
| 3 | Energy – Offshore Wind Farms | | | | | | |
| | Pre-planning application | Norfolk Boreas | 112 | Up to 1800 MW | Unknown | NA | Unknown |
| | Pre-planning application | East Anglia TWO | 112 | Up to 800 MW | 2022-2024 | Yes | Yes |
| | Planned | Norfolk Vanguard | 0 | Up to 1800 MW | 2020-2022 | Yes | Yes |

10.12.2 Maximum design scenario

10.12.2.1 The maximum design scenarios identified in Table 10.68 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 design 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 10.68: Maximum design scenario considered for the assessment of potential cumulative impacts on socio-economics.

| Potential impact | Maximum design scenario | Justification |
|--|--|--|
| 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. | <p><i>Tier 1</i></p> <ul style="list-style-type: none"> • Dogger Bank Creyke Beck A; • Dogger Bank Creyke Beck B; • Dogger Bank Teesside A & Sofia Offshore Wind Farm; • 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; and • Westermost Rough. <p><i>Tier 3</i></p> <ul style="list-style-type: none"> • Norfolk Vanguard; • Norfolk Boreas; and • East Anglia TWO. | The projects are located in an area with current or potential use of ports in Hornsea Three local economic development study area (i.e. 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. | <p><i>Tier 1</i></p> <ul style="list-style-type: none"> • Dogger Bank Creyke Beck A; • Dogger Bank Creyke Beck B; • Dogger Bank Teesside A & Sofia Offshore Wind Farm Dudgeon; • East Anglia ONE; and • East Anglia THREE. | The projects are located in an area with current or potential use of ports in Hornsea Three local economic development study area (i.e. 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. |

| Potential impact | Maximum design scenario | Justification |
|--|--|--|
| 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. | <ul style="list-style-type: none"> • Galloper; • Greater Gabbard; • Hornsea Project One; • Hornsea Project Two; • Humber Gateway; • LID6 1; • Lincs; • Lynn and Inner Dowsing Wind Farms; • Race Ban; • Scroby Sands; • Sheringham Shoal; • Triton Knoll; and • Westermost Rough. | 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 economic development study area. |
| 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. | <ul style="list-style-type: none"> • Race Ban; • Scroby Sands; • Sheringham Shoal; • Triton Knoll; and • Westermost Rough. | 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. | <p><i>Tier 3</i></p> <ul style="list-style-type: none"> • Norfolk Vanguard; • Norfolk Boreas; and • East Anglia TWO. | The projects in combination with Hornsea Three may have a significant effect on tourism and recreation if they are being constructed in the tourism and recreation study 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 and recreation study area. |

| Potential impact | Maximum design scenario | Justification |
|---|--|--|
| Operation and Maintenance 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. | <p><i>Tier 1</i></p> <ul style="list-style-type: none"> • Dogger Bank Creyke Beck A; • Dogger Bank Creyke Beck B; • Dogger Bank Teesside A & Sofia Offshore Wind Farm; • 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; and • Westermost Rough. <p><i>Tier 3</i></p> <ul style="list-style-type: none"> • Norfolk Vanguard; • Norfolk Boreas; and • East Anglia TWO. | The projects are located in an area with current or potential use of ports in Hornsea Three local economic development study areas (i.e. 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. | <p><i>Tier 1</i></p> <ul style="list-style-type: none"> • Dogger Bank Creyke Beck A; • Dogger Bank Creyke Beck B; • Dogger Bank Teesside A & Sofia; Offshore Wind Farm; • 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; and | The projects are located in an area with current or potential use of ports in Hornsea Three local economic development study area (i.e. 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. | <ul style="list-style-type: none"> • 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; and | 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 economic development study 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. | <ul style="list-style-type: none"> • Race Bank; • Scroby Sands; • Sheringham Shoal; • Triton Knoll; and | The projects in combination with Hornsea Three may have a significant beneficial effect on the development of the renewable energy sector. |

| Potential impact | Maximum design scenario | Justification |
|---|---|---|
| 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. | <ul style="list-style-type: none"> • Westermost Rough. <p><i>Tier 3</i></p> <ul style="list-style-type: none"> • Norfolk Vanguard; • Norfolk Boreas; and • East Anglia TWO. | The projects in combination with Hornsea Three may have a significant effect on tourism and recreation if they are being maintained in the tourism and recreation study area. |
| 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 and recreation study 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. |

10.13 Cumulative Effect Assessment

10.13.1.1 The significance of cumulative effects upon socio-economic receptors arising from each identified impact is set out in this section.

10.13.1.2 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.

10.13.1.3 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 Study 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 Study 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.

10.13.1.4 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.

10.13.1.5 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 chapter 7: Traffic and Transport). 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 cumulative effect assessment has been assessed below.

10.13.2 Construction phase

10.13.2.1 The potential for cumulative effects during the construction phase extends to the proposed infrastructure development of other offshore wind energy developments within the Local Study Area and other developments that would draw on a similar supply chain or labour market to Hornsea Three.

10.13.2.2 Two considerations are relevant in identifying the schemes which need to be considered as part of the socio-economic cumulative assessment. Firstly, the extent to which time periods for construction and operation overlaps with Hornsea Three needs to be considered in identifying relevant schemes for the assessment. In light of the uncertainty in relation to when some schemes will be coming forward (and indeed, when construction activity for Hornsea Three would commence if consent was granted), the cumulative assessment includes all those projects which are expected to come forward in a similar timeframe.

10.13.2.3 Secondly, the type of activities associated with the construction and operation of the cumulative schemes and the extent to which these will place demands upon the same supply chain and labour markets as Hornsea Three are also considered. For example, the direct and indirect effects of Hornsea Three in the construction and O&M phases would be focused on a relatively small number of sectors, namely:

- (i) Manufacturing and engineering sectors: particularly companies manufacturing fabricated metal products, electric motors, wiring machinery, engines and turbines;

- (ii) Construction sectors: particularly specialist construction services, construction of civil engineering projects and building of ships, boats and floating structures;
- (iii) Marine transport: sea and coastal freight, water transport and ancillary services; and
- (iv) Accommodation and food service sectors.

10.13.2.4 The cumulative assessment must consider the capacity for the economy in the UK and local economic development study areas to adapt to the additional demands that these developments, in conjunction with Hornsea Three, will place on the supply chains and labour markets in the study areas. This process of adaption may occur through natural economic processes (i.e. capacity in labour markets or supply chains will expand to fulfil the increased demand associated with Hornsea Three and the Cumulative Schemes). Alternatively, adaption may take place as a result of other public or private sector investments of programmes aimed at increasing capacity locally. Examples of such programmes might include activities of the LEPs in relation to skills developments in the renewable energy sector, or investments in facilities which would also increase local economic capacity.

10.13.2.5 This means that the cumulative assessment cannot be provided on the basis of a static picture of local and national capacity to service the supply chain and labour market requirements of these developments. The likely timing of the developments is not clear, and nor is the extent to which developers would use local supply chain and labour market capacity. This makes it impossible to assess the significance of the cumulative effects on Hornsea Three as the cumulative schemes could have both positive and negative effects on the scale of Hornsea Three's impact. That is:

- (i) If the construction phases overlapped with Hornsea Three, the supply chain or labour market capacity that Hornsea Three could draw upon might be constrained. If the cumulative schemes caused supply-side constraints this could make the lower impact scenarios for Hornsea Three more likely to occur; and
- (ii) The cumulative schemes were constructed before Hornsea Three and had the effect of increasing supply side capacity. This could increase the likelihood that the higher impact scenarios in the main assessment for Hornsea Three would come to fruition.

10.13.2.6 The upshot is that there is substantial uncertainty about the effect that cumulative schemes might have on the impact supported by Hornsea Three. It is important to note however that, taken together, the cumulative schemes are unlikely to adversely affect the baseline position in relation to employment, GVA and access to local employment. That is, Hornsea Three is not expected to contribute to adverse cumulative effects for these receptors.

10.13.2.7 The cumulative assessment methodology for Hornsea Three advises the use of Tiers for the assessment to reflect the differing potential for projects to come forward. Due to the aforementioned uncertainties which exist with the socio-economic assessment, the analysis would be unable to distinguish the additional impact which the projects across different tiers may have. Therefore, the conclusion drawn for each tier is identical.

The cumulative impact of construction of Hornsea Three on access to construction-related employment and GVA considered together with the construction and operation of other planned nearby wind farm projects.

10.13.2.8 The driver of cumulative impact on labour market demands in the local economic development study area will be driven by simultaneous construction activity of offshore wind farms. Projects with ongoing O&M activities at the time of construction of Hornsea Three will be contributing to the demand for workers, but to a much lesser extent. Instead, projects that have completed construction before Hornsea Three are likely to have contribute to the supply chain capabilities in the UK (provided goods and services were sourced from the UK), positioning Hornsea Three to be better able to achieve the high impact construction scenarios outlined earlier.

10.13.2.9 While there are 21 projects identified for the assessment, only six have the potential to overlap with Hornsea Three during the construction phase.

10.13.2.10 As outlined in the assessment of employment impacts of Hornsea Three, construction impacts are expected to be driven by the capacity and capability in the UK and local labour market. This also applies to the cumulative effect:

- The extent of overlapping activities will depend on projects using UK ports for construction and O&M, particularly in the Humber and New Anglia Study Areas; and
- The geographical pattern of supply chain sourcing – for example, several projects sourcing blades from the Siemens facility in Hull may limit the capacity as a result.

10.13.2.11 At the moment, there is limited clarity on the patterns of supply chain sourcing for Hornsea Three as well as for other offshore wind farm projects. The cumulative assessment should be considered with this uncertainty in mind.

Tier 1

Magnitude of impact

10.13.2.12 The Tier 1 projects which have overlapping construction periods with Hornsea Three are Dogger Bank Creyke Beck A, Dogger Bank Creyke Beck B, East Anglia THREE and Triton Knoll (the latter for the final year of its construction).

10.13.2.13 The simultaneous construction of these wind farms could constrain the ability of UK workers to be able to meet the labour market requirement for construction of all projects due to limited capacity. These impacts in the local economic development study areas will be driven primarily by the choice of construction ports for the projects – if the schemes opt to use the same ports for construction, there may be insufficient capacity in the local supply chain and labour market to accommodate all of this activity.

10.13.2.14 It should be noted that while simultaneous activity may restrict the beneficial impact attributable to each individual project, the local economic development study areas as a whole would not experience a reduction in potential benefits, as the capacity to supply goods and services would be taken up.

10.13.2.15 In a more positive scenario, the simultaneous construction activities may cause a supply-side response and stimulate investment in the supply chains, increasing capacity as a result. This would increase the potential to source labour and supply chain activities locally.

10.13.2.16 In addition, a number of schemes overlap with Hornsea Three construction phase while they are operational and continue to generate impact. These projects (i.e. Dudgeon, East Anglia ONE, Galloper, Greater Gobbard, Sheringham Shoal and Scroby Sands in New Anglia, and Hornsea Project One - Heron Wind, Hornsea Project Two - Optimus Wind, Humber Gateway, LID6 1, Lincs, Lynn and Inner Dowsing Wind Farms, Race Bank and Westermost Rough in the Humber) have (or will) contribute to growing capacity in the respective local economic development study areas. For example, as outlined in the baseline section, Great Yarmouth port has secured investment in a Siemens assembly and installation base to service the construction of Galloper offshore wind farm. These activities maximise the potential to secure local employment and supply chain sourcing.

10.13.2.17 It is not possible to predict how the cumulative impacts will be generated with any confidence. A good indication, however, is the maximum level of benefit which the local economic development study areas are able to absorb based on their current capability. The highest sourcing construction scenarios which have been developed for each of the study areas in considering the potential impact of Hornsea Three individually can be seen to represent the upper limit of potential benefit to each of the areas. While this does not take account of any future supply chain responses and further investment (as these cannot be predicted), it represents a conservative indication of the potential benefit which each of the study areas can absorb.

10.13.2.18 Concurrent construction activity in each of the local economic development study areas increases the potential stream of employment opportunities and supply chain contracts which the local economic development study areas may benefit from, therefore increasing the certainty of the higher levels of cumulative benefit.

10.13.2.19 As the cumulative assessment cannot predict supply chain capabilities beyond the higher sourcing scenarios developed for Hornsea Three individually, the main conclusion is that the cumulative benefits for the local economic development study areas could be at least the level which was identified for Hornsea Three in the individual assessment.

10.13.2.20 The impact is predicted to be of short term duration. It is predicted that the impact will affect the receptor directly. The magnitude is therefore, considered to be at least low for employment impacts and high for GVA impacts.

Sensitivity of receptor

10.13.2.21 The employment and GVA receptors are deemed to be of high vulnerability and high value. The sensitivity of the receptors is therefore, considered to be high.

Significance of Effect

10.13.2.22 Overall, it is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be low. The effect will, therefore, be of **moderate beneficial** significance for employment creation, and **major beneficial** significance for GVA creation, both of which are significant in EIA terms.

Tier 3

Magnitude of impact

10.13.2.23 Additional Tier 3 projects include the Norfolk Vanguard offshore wind farm, the Norfolk Boreas and East Anglia TWO offshore wind farms. The projects overlap with Hornsea Three during the construction phase, however, the contribution to the cumulative impact will depend on the choice of the construction ports for the projects as well as the supply chain sourcing.

Sensitivity of receptor

10.13.2.24 The employment and GVA receptors are deemed to be of high vulnerability and high value. The sensitivity of the receptors is therefore, considered to be high.

Significance of Effect

10.13.2.25 Overall, it is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be low. The effect will, therefore, be of **moderate beneficial** significance for employment creation, and **major beneficial** significance for GVA creation, both of which are significant in EIA terms.

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.

Tier 1

Magnitude of impact

10.13.2.26 It is difficult to predict the how much labour is likely to be sourced from outside the Local Impact Areas during the construction of the projects, which would drive the demand for housing and local services.

10.13.2.27 If the simultaneous construction activities result in capacity constraints in the local labour market, there is potential for more workers coming in from outside New Anglia Local Impact Area and Humber Local Impact Area respectively. It is important to note that it is unlikely that all projects that overlap in construction period will have the same local impact areas, which would result in respective local areas being better able to meet the labour demand.

10.13.2.28 Overall, it is difficult to predict the level of impact on this receptor. The cumulative impact can be reasonably expected to be minor.

Sensitivity of receptor

10.13.2.29 The receptor is deemed to be of medium vulnerability and medium value. The sensitivity of the receptor is therefore, considered to be medium.

Significance of Effect

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

Tier 3

Magnitude of impact

10.13.2.31 As with Tier 1, the cumulative impact is expected to be minor.

Sensitivity of receptor

10.13.2.32 The receptor is deemed to be of medium vulnerability and medium value. The sensitivity of the receptor is therefore, considered to be medium.

Significance of Effect

10.13.2.33 It is expected that the sensitivity of the receptor is considered to be medium and the magnitude is deemed to be low. 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 the performance of the renewable energy sector considered together with the construction and operation of other planned nearby wind farm projects.

Tier 1

Magnitude of impact

10.13.2.34 Overlapping construction activities are likely to create increased demand for the services of the renewable energy sector and its supply chain. This may stimulate long term benefits for the sector as it encourages investment to increase capacity in the sector to be able to meet the rises in demand.

10.13.2.35 The extent to which this may occur depends on a number of factors:

- Firstly, as outlined earlier, the construction activities may be concentrated in different spatial areas and we cannot currently say where the impacts will occur. This will depend on the choice of construction ports for each of the cumulative projects. The impact is likely to be greatest if all construction ports are located in the same area, which is unlikely; and
- Secondly, the impacts are likely to be short lived and restricted to the construction period. This may cause suppliers to be reluctant to invest in capacity improvements unless there is a long term demand for their services.

10.13.2.36 It is difficult to predict how the supply chain will react given the uncertainties around the selection of ports, geographical sourcing patterns and investment decisions from suppliers. The projects that overall in O&M with the construction of Hornsea Three are likely to contribute, or have contributed, to increases in capacity in the sector therefore contributing to the development of the renewable energy sector.

10.13.2.37 Given the short term duration of impacts and the assessment of Hornsea Three in isolation, the cumulative impact can be expected to be of medium magnitude.

Sensitivity of receptor

10.13.2.38 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

10.13.2.39 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be medium. The effect will, therefore, be of **moderate beneficial** significance, which is significant in EIA terms.

Tier 3

Magnitude of impact

10.13.2.40 The impacts for Tier 3 projects are expected to arise in the same way as for Tier 1.

10.13.2.41 Given the short term duration of impacts and the assessment of Hornsea Three in isolation, the cumulative impact can be expected to be of medium magnitude.

Sensitivity of receptor

10.13.2.42 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

10.13.2.43 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be medium. The effect will, therefore, be of **moderate beneficial** significance, which is significant in EIA terms.

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.

10.13.2.44 The cumulative effects on the receptor would be driven by effects in chapter 4: Landscape and Visual Resources, chapter 8: Noise and Vibration, chapter 6: Land Use and Recreation, and chapter 7: Traffic and Transport.

Tier 1

Magnitude of impact

10.13.2.45 The assessment within the relevant Environmental Statement chapters outlined in 10.13.2.44 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; and
- The cumulative effect on traffic and transport did not identify any significant effects expected during construction.

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

Sensitivity of receptor

10.13.2.47 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

10.13.2.48 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

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

Sensitivity of receptor

10.13.2.50 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

10.13.2.51 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

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

Sensitivity of receptor

10.13.2.53 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

10.13.2.54 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.

10.13.2.55 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

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

10.13.2.57 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.2.58 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

10.13.2.59 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

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

10.13.2.61 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.2.62 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

10.13.2.63 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

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

10.13.2.65 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.2.66 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

10.13.2.67 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.

Future monitoring

10.13.2.68 No socio-economic and tourism monitoring to test the predictions made within the construction phase cumulative impact assessment is considered necessary

10.13.3 Operation and maintenance phase

The cumulative impact of operation and maintenance of Hornsea Three on access to operation and maintenance-related employment and GVA considered together with the construction and operation of other planned nearby wind farm projects.

10.13.3.1 O&M is a long term activity expected to take place over three and a half decades. This would allow for any necessary supply-side adjustments to increase capacity in the supply chain and the labour market.

10.13.3.2 Therefore, overlapping O&M phases for cumulative projects can be seen largely as beneficial as they encourage supply chain development.

10.13.3.3 As with the construction phase, some projects that are not yet operating are also subject to uncertainties around supply chain sourcing and port selection. Hornsea Three is not yet certain on which port is going to be used for O&M so the assessment should be considered with this in mind.

Tier 1

Magnitude of impact

10.13.3.4 As with construction, the magnitude of impact will depend on port selection and supply chain sourcing.

10.13.3.5 Out of the Tier 1 cumulative O&M projects there are:

- 7 using the ports in Humber local economic development study area for O&M, with potentially more to be confirmed; and
- 5 operating from New Anglian ports with potentially one more project to be decided.

10.13.3.6 The implication is that the cumulative impact will occur with the projects that are operating in respective areas, depending on which O&M port would be chosen for Hornsea Three (if any).

10.13.3.7 There are several ports within each of the local economic development study areas that Hornsea Three will be able to choose from. The cumulative assessment can be viewed from two perspectives:

- Should the choice of O&M ports for the cumulative projects be dispersed, the benefit may be maximised for the local economic development study areas as more ports are able to benefit from the cumulative activity; and
- Should the cumulative projects opt for using the same port (or more realistically, a small selection of ports), this may result in port capacity being constrained and projects which were not able to secure the desired port location may need to use a location outside of the respective Local Study Area. This would result in a smaller scale of benefit.

10.13.3.8 It is difficult for the assessment to predict to what extent the ports in local economic development study areas may decide to invest to increase capacity. This would in turn increase the level of benefit local economic development study areas would be able to capture.

10.13.3.9 Given the ports are able to accommodate several ongoing projects and are undergoing investments (outlined in the baseline section) we would anticipate the cumulative O&M impact to be significant (especially considering Hornsea Three on its own would be expected to deliver significant benefits should it use a local port). With multiple projects in O&M phase taking place at the same time, the benefit could be of even greater magnitude. Therefore, the magnitude of cumulative impact is expected to be major.

Sensitivity of receptor

10.13.3.10 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

10.13.3.11 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be high. The effect will, therefore, be of **major beneficial** significance, which is significant in EIA terms.

Tier 3

Magnitude of impact

10.13.3.12 Tier 3 includes three additional projects. All projects (Norfolk Vanguard, Norfolk Boreas, and East Anglia TWO) may consider O&M ports in New Anglia local economic development study area, although this is uncertain at this stage.

10.13.3.13 Impacts are expected to arise in a similar way to Tier 1. Therefore, the magnitude of cumulative impact is expected to be major.

Sensitivity of receptor

10.13.3.14 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

10.13.3.15 It is expected that the sensitivity of the receptor is considered to be high and the magnitude is deemed to be high. The effect will, therefore, be of **major beneficial** significance, which is significant in EIA terms.

The cumulative impact of operation and maintenance 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.

Tier 1

Magnitude of impact

10.13.3.16 O&M jobs are long term in nature and localised, so there is greater scope to source these from within the local economic development study areas (depending on which O&M port is chosen). This means there is a reduced requirement for workers to come in from outside of the local economic development study areas.

10.13.3.17 In the event that O&M jobs cannot be filled from within the local economic development study areas where the chosen port is located and positions have to be filled by incoming workers, the absolute number of workers who may need to be accommodated is sufficiently low in the context of the population that the local economic development study areas should be able to absorb it with no strain on housing or local services.

10.13.3.18 Therefore, there would be limited additional demands placed on housing, accommodation and local services as a result of the cumulative O&M activities. Magnitude of impact is considered to be minor.

Sensitivity of receptor

10.13.3.19 The receptor is deemed to be of medium vulnerability and medium value. The sensitivity of the receptor is therefore, considered to be medium.

Significance of Effect

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

Tier 3

Magnitude of impact

10.13.3.21 As with Tier 1, the magnitude of impact is considered to be minor.

Sensitivity of receptor

10.13.3.22 The receptor is deemed to be of medium vulnerability and medium value. The sensitivity of the receptor is therefore, considered to be medium.

Significance of Effect

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

The cumulative impact of operation and maintenance 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.

10.13.3.24 O&M is a long-term activity and simultaneous O&M projects may have a catalytic effect on the development of the renewable energy sector.

10.13.3.25 As outlined for the earlier receptors, the scale of the cumulative impact is likely to depend on the choice of the O&M port for Hornsea Three and the cumulative projects which will determine the concentration of the renewable energy sector in the local economic development study areas where the port may be located.

Tier 1

Magnitude of impact

10.13.3.26 As outlined previously, there are:

- Seven Tier 1 projects using the ports in Humber Local Impact Area for O&M (namely Humber Gateway, LID6 1, Lincs, Lynn and Inner Dowsing Wind Farms, Race Bank, Westernmost Rough, Hornsea Project One, and Hornsea Project Two), with potentially a couple more to be confirmed; and
- Five Tier 1 operating from New Anglian ports (namely Dudgeon, East Anglia ONE, East Anglia THREE, Greater Gabbard, Scroby Sands, and Sheringham Shoal) with potentially one more project to be decided.

10.13.3.27 In conjunction with the existing activities in these two areas, there would not be any significant effects anticipated from the addition of Hornsea Three and a few other O&M projects to any of the locations.

10.13.3.28 Therefore, the magnitude of the impact is expected to be minor.

Sensitivity of receptor

10.13.3.29 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

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

Tier 3

Magnitude of impact

10.13.3.31 As with Tier 1 assessment, the magnitude of the impact is expected to be minor.

Sensitivity of receptor

10.13.3.32 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

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

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.

10.13.3.34 The cumulative effects on the receptor would be driven by the effects of O&M on chapter 4: Landscape and Visual Resources, chapter 6: Land Use and Recreation, chapter 7: Traffic and Transport and chapter 8: Noise and Vibration.

Tier 1

Magnitude of impact

10.13.3.35 The assessment within the relevant Environmental Statement chapters outlined in 10.13.3.34 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; and
- The cumulative effect on traffic and transport did not identify any significant effects.

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

Sensitivity of receptor

10.13.3.37 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

10.13.3.38 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

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

Sensitivity of receptor

10.13.3.40 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

10.13.3.41 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

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

Sensitivity of receptor

10.13.3.43 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

10.13.3.44 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.

10.13.3.45 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

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

10.13.3.47 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.3.48 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

10.13.3.49 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

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

10.13.3.51 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.3.52 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

10.13.3.53 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

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

10.13.3.55 Therefore, the magnitude of cumulative impact on the receptor is expected to be negligible.

Sensitivity of receptor

10.13.3.56 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

10.13.3.57 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.

Future monitoring

10.13.3.58 No socio-economic and tourism monitoring to test the predictions made within the operation and maintenance phase cumulative impact assessment is considered necessary.

10.13.4 Decommissioning phase

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

10.13.4.2 The decommissioning phase is subject to even more uncertainty given it is far ahead in the future. It is therefore very difficult to draw any firm conclusions about what the cumulative impacts of decommissioning of Hornsea Three may be. Given the type of activity which will take place during decommissioning draws on similar skills and supply chain requirements as the construction phase, the expected cumulative decommissioning effects are concluded to be comparable to those during construction phase. Therefore, as for the impacts listed in section 10.13.2, the effects of the decommissioning of Hornsea Three are likely to be of **minor adverse** to **major beneficial** significance, which is significant in EIA terms.

Future monitoring

10.13.4.3 No socio-economic and tourism monitoring to test the predictions made within the decommissioning phase cumulative impact assessment is considered necessary.

10.14 Transboundary effects

10.14.1.1 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.

10.14.1.2 We expect the transboundary effects which may arise to be primarily beneficial in the countries affected, as they 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.

10.14.1.3 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.

10.14.1.4 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.

10.15 Inter-related effects

10.15.1.1 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, operation 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); and
- 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.

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

10.16 Conclusion and summary

10.16.1.1 The socio-economics chapter defined the baseline environment for two local economic development study areas – Humber LEP and New Anglia LEP in the context of the UK:

- New Anglia local economic development study area has a population of 1.6 million people and contributes £35bn GVA to the UK economy. The area is associated with above average employment rate (76% compared to 74% nationally), and low unemployment (4% compared to 5% nationally). Of the 551,000 FTE employees in New Anglia, 79,000 are employed in sectors with supply chain opportunities for construction and O&M of Hornsea Three. Sub-sector specialisms include manufacturing, transportation and accommodation services; and
- Humber local economic development study area is home to 928,000 people and generated 17.8bn GVA annually. Humber's employment rate is 73% (compared to 74% in the UK) and similar unemployment rate (to the national (both 5%). There are 317,000 FTE employees in Humber, of whom 40,000 are employed in sectors related to Hornsea Three supply chain. Area's specialisms include several manufacturing sub-sectors and transportation.

10.16.1.2 The analysis of the potential socio-economic impacts that would be associated with Hornsea Three were assessed using a scenario-based approach. The approach considers the impact of the construction, O&M and decommissioning phases of Hornsea Three on the UK as well as the local economic development study areas: New Anglia LEP and Humber LEP.

10.16.1.3 During the construction phase, there would be potential significant beneficial impacts in the Humber Local Study Area in relation to employment (under the high impact scenario), GVA (under the medium and high scenario), access to employment among local residents (under the medium and high scenario), and the performance of the renewable energy sector (under the high scenario). In New Anglia LEP, there would be potential significant beneficial impacts in relation to access to employment among local residents under the medium scenario.

10.16.1.4 During the O&M phase, there is potential for both local economic development study areas to experience impacts of major beneficial significance in relation to employment creation and access to employment among local residents, under the high impact scenario.

10.16.1.5 Potential adverse impacts have been identified in New Anglia LEP and Humber LEP on the demand for housing, accommodation and local services during construction and O&M. These impacts are not expected to be significant in EIA terms. In addition, potential adverse impacts have been identified in Tourism and Recreation study area 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.

10.16.1.6 Given the uncertainty that exists in relation to the decommissioning activity, the assessment of the effects associated with this phase have been assessed in a qualitative manner. It is anticipated that the nature of the socio-economic impact across all study areas would be similar to that occurring during the construction phase, although the magnitude of impact and significance of effects are likely to be more limited.

10.16.1.7 The cumulative effects of other developments which are expected to be constructed and operated in a similar period to Hornsea Three could result in beneficial effects across a number of receptors. There is however a great deal of uncertainty associated with the effects highlighted under the cumulative assessment driven by how and in what form the projects may come forward (if at all). This should be taken into account when interpreting the results.

Table 10.69: Summary of potential environment effects, mitigation and monitoring.

| Description of impact | Measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Significance of effect | Additional measures | Residual effect | Proposed monitoring |
|---|---|--|-------------------------|---|---------------------|-----------------|---------------------|
| Construction Phase | | | | | | | |
| The construction of Hornsea Three may have an impact on employment in construction in the supply chain: UK economic development study area. | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on employment in construction in the supply chain: New Anglia LEP local economic development study area. | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on employment in construction in the supply chain: Humber LEP local economic development study areas. | See measures in Table 10.38 | Negligible for low and medium impact scenarios. Low for high impact scenario. | High | Low and medium scenarios - Minor Beneficial (not significant in EIA terms) High scenario – Moderate Beneficial (significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the amount of GVA supported by construction activity: UK economic development study area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the amount of GVA supported by construction activity: New Anglia LEP local economic development study area. | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the amount of GVA supported by construction activity: Humber LEP local economic development study areas | See measures in Table 10.38 | Negligible for low impact scenario, Minor for medium impact scenario, High for high impact scenario. | High | Low scenario – Minor Beneficial (not significant in EIA terms) Medium scenario – Moderate Beneficial (significant in EIA terms) High scenario – major beneficial (significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents: New Anglia LEP local economic development study area | See measures in Table 10.38 | Negligible for low impact scenario, Major for medium impact scenario | High | Low scenario – Negligible (not significant in EIA terms) Medium scenario – Major Beneficial (significant in EIA terms) | None | None | None |

| Description of impact | Measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Significance of effect | Additional measures | Residual effect | Proposed monitoring |
|---|---|--|-------------------------|---|---------------------|-----------------|---------------------|
| The construction of Hornsea Three may have an impact on access to construction-related employment amongst local residents: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Negligible for low impact scenario, Major for medium and high impact scenario | High | Low scenario – Negligible (not significant in EIA terms) Medium and high scenario – Major Beneficial (significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the demand for housing, accommodation and local services: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the demand for housing, accommodation and local services: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the performance of the renewable energy sector: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on the performance of the renewable energy sector: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Negligible for the low impact scenario; Minor for the medium scenario Moderate for the high impact scenario. | High | Low and medium scenario – Minor Beneficial (not significant in EIA terms) High scenario – Moderate Beneficial (significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: <i>Tourism and recreation study area.</i> | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |
| The construction of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW: <i>Tourism and recreation study area</i> | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |
| Operation and Maintenance Phase | | | | | | | |
| The O&M of Hornsea Three may have an impact on employment in O&M in the supply chain: <i>UK economic development study area</i> | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |

| Description of impact | Measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Significance of effect | Additional measures | Residual effect | Proposed monitoring |
|--|---|--|-------------------------|---|---------------------|-----------------|---------------------|
| The O&M of Hornsea Three may have an impact on employment in O&M in the supply chain: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – negligible High scenario - major | High | Low scenario - Minor Beneficial (not significant in EIA terms) High scenario – Major Beneficial (significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on employment in O&M and in the supply chain: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – negligible High scenario - major | High | Low scenario - Minor Beneficial (not significant in EIA terms) High scenario – Major Beneficial (significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the amount of GVA supported by O&M activity: <i>UK local economic development study area</i> | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the amount of GVA supported by O&M activity: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – no change High scenario - negligible | High | Low scenario - Negligible (not significant in EIA terms) High scenario – Minor Beneficial (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the amount of GVA supported by O&M activity: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – no change High scenario - minor | High | Low scenario - Negligible (not significant in EIA terms) High scenario – Moderate Beneficial (significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on access to O&M - related employment amongst local residents: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – no change High scenario - major | High | Low scenario - Negligible (not significant in EIA terms) High scenario – Major Beneficial (significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on access to O&M - related employment amongst local residents: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Low scenario – no change High scenario - major | High | Low scenario – Negligible (not significant in EIA terms) High scenario – Major Beneficial (significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the demand for housing, accommodation and local services: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |

| Description of impact | Measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Significance of effect | Additional measures | Residual effect | Proposed monitoring |
|---|---|---------------------|-------------------------|--|---------------------|-----------------|---------------------|
| The O&M of Hornsea Three may have an impact on the demand for housing, accommodation and local services: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the performance of the renewable energy sector: <i>New Anglia LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on the performance of the renewable energy sector: <i>Humber LEP local economic development study area</i> | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: <i>Tourism and recreation study area</i> | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |
| The O&M of Hornsea Three may have an impact on local tourism and recreational resources, including PRow. | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |
| Decommissioning Phase | | | | | | | |
| The decommissioning of Hornsea Three may have an impact on decommissioning related employment: UK Impact Area. | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on decommissioning related employment: Humber LEP Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on decommissioning employment and in the supply chain: New Anglia LEP Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on the amount of GVA supported by decommissioning activity: UK Impact Area. | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |

| Description of impact | Measures adopted as part of the project | Magnitude of impact | Sensitivity of receptor | Significance of effect | Additional measures | Residual effect | Proposed monitoring |
|--|---|---------------------|-------------------------|--|---------------------|-----------------|---------------------|
| The decommissioning of Hornsea Three may have an impact on the amount of GVA supported by decommissioning activity: Humber LEP Local Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on the amount of GVA supported by decommissioning activity: New Anglia LEP Local Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on access to decommissioning-related employment amongst local residents: Humber LEP Local Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on access to decommissioning-related employment amongst local residents: New Anglia LEP Local Impact Area | See measures in Table 10.38 | Negligible | High | Minor Beneficial (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on the demand for housing, accommodation and local services: Humber LEP Local Impact Area | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on the demand for housing, accommodation and local services: New Anglia LEP Local Impact Area | See measures in Table 10.38 | Negligible | Medium | Negligible (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on offshore and coastal tourism and recreation activity and associated economic value: Tourism Impact Area | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |
| The decommissioning of Hornsea Three may have an impact on local tourism and recreational resources, including PRoW. | See measures in Table 10.38 | Negligible | High | Minor Adverse (not significant in EIA terms) | None | None | None |

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