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Glossary

Dependency Ratio	The relationship between the productive element of the population and the economically dependent.
Direct jobs	Jobs directly within the Project.
Displacement effects	The proportion of jobs or other benefits accounted for by reduced benefits elsewhere within the study or wider area.
Economic activity rate	The percentage of the population, both in employment and unemployed that represents the labour supply.
Economic multiplier	Further economic activity (jobs, expenditure or income) associated with additional local income and local supplier purchases.
Ex-Ante Assessment	Assessment of the impacts of a project pre-development.
Ex Post Assessment	Evaluation of the impacts of a project post-development.
Job density	The number of jobs for every resident (aged 16-64).
Leakage effects	Those jobs taken up by people from outside the specific study area labour market catchment.

Abbreviations and Acronyms

CAPEX	Capital Expenditure
GVA	Gross Value Added
MW	Megawatt
NOMIS	The Office for National Statistics
OPEX	Operational Expenditure

22 Socio-economics and Tourism

22.1 Introduction

1 This chapter presents an assessment of the socio-economic and tourism impacts predicted to arise from the development of the Inch Cape Offshore Wind Farm.

2 This chapter includes an assessment of the direct and indirect impacts upon the economy of an Economic Study Area as defined in *Section 22.4.1*, which is intended to provide a representative analysis for areas within Scotland. The chapter includes an assessment on a Tourism Study Area as defined in *Section 22.4.2.* On a wider basis, the assessment also considers impacts beyond the study areas for the whole of Scotland and the United Kingdom (UK).

3 The accompanying *Appendix 22A: Socio-economics and Tourism Baseline* provides relevant baseline information for the Economic and Tourism Study Areas.

4 This chapter makes reference to information used and presented in other chapters including:

- *Chapter 5: Stakeholder Engagement*;
- *Chapter 16: Seascape, Landscape and Visual*;
- *Chapter 18: Commercial Fisheries*; and
- *Chapter 21: Other Human Considerations*.

5 Cross-references are provided throughout the assessment, where relevant.

22.2 Consultation

22.2.1 Scoping and formal correspondence

6 Scoping responses relating to socio-economics were received from Dundee City Council (4 May 2010) and The Crown Estate (23 August 2010). Table 22.1 summarises the responses received.

Table 22.1: Scoping and Consultation Responses

Consultees	Consultation Response	Project Response
Dundee City Council	Reference to Inch Cape offshore wind farm proposal as an economic development opportunity.	Addressed throughout this chapter.
The Crown Estate	Reference to socio-economic issues being included within the assessment.	Addressed throughout this chapter.

22.2.2 Community Consultation

7 Four community consultation events were jointly organised by Inch Cape Offshore Limited (ICOL), Mainstream Renewable Power and Seagreen Wind Energy Limited, and the following community galas and fetes were attended by the three developers:

- Carnoustie Gala: 7 July 2012;
- St Andrews Highland Games: 29 July 2012;
- Anstruther Muster: 11 August 2012; and
- Leuchars Air Show: 15 September 2012.

8 At each event, views and opinions were collected via questionnaires, the results of which are fully detailed in *Appendix 5D: Phase 2 Public Engagement Results*.

9 The information received through the consultation and formal Scoping Opinion, together with recognised best practice, has informed the methodology and scope for the assessment of the impacts of the Project upon socio-economics and tourism presented in this chapter.

22.3 Policy and Plans

10 A detailed review of legislation, charters, conventions and planning documents has been provided in *Chapter 2: Policy and Legal Background* and *Chapter 3: Regulatory Requirements*. For the purposes of this chapter a wide range of socio-economic related documents have been considered including the following:

- *Scottish Government Economic Strategy* (Scottish Government, 2011a);
- *Blue Seas, Green Energy: A Sectoral Marine Plan for Offshore Wind Energy in Scottish Territorial Waters: Part A The Plan* (Marine Scotland, 2011);
- *Scotland's Offshore Wind Route Map: Developing Scotland's Offshore Wind Industry to 2020* (Scottish Government, 2010);
- *2020 Routemap for Renewable Energy in Scotland* (Scottish Government, 2011b);
- *Working for a Green Britain– Employment and Skills in the UK Wind and Marine Industry,* (Renewable UK, 2011);
- *National Renewables Infrastructure Plan* (Scottish Enterprise, 2010); and
- *National Renewables Infrastructure Fund* (Scottish Enterprise, 2012).

11 A review of relevant socio-economic legislation, policy and specific initiatives is given in *Appendix 22A (Section 22A.2)*. A number of relevant guidance documents have also been published and are listed under Guidance and Methods in *Section 22.4.2* below.

22.4 Assessment Methodology

22.4.1 Definition of the Economic Study Area

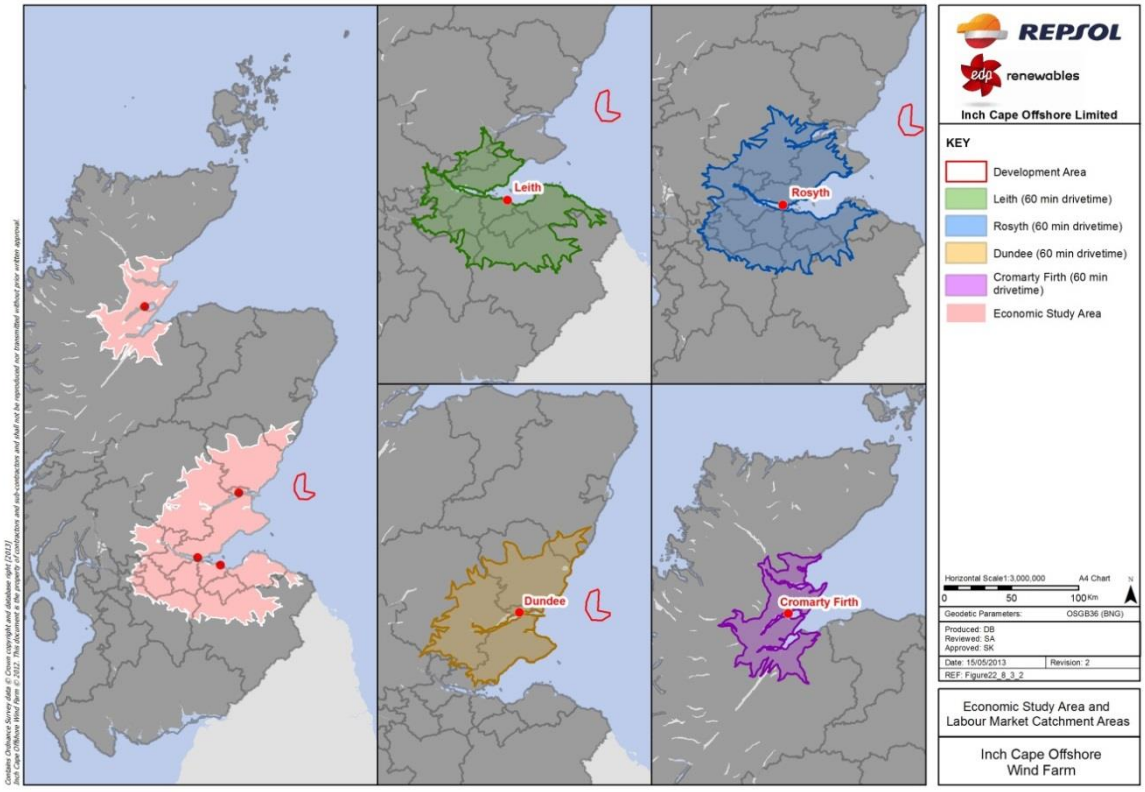
12 An Economic Study Area was defined following consideration of the potential for effects along the east coast of Scotland whilst recognising that effects may arise across Scotland, the UK and also further afield due to the scale of the Project.

13 There are a range of facilities within the UK and specifically along the east coast of Scotland that could support elements of the construction, operation and maintenance (O&M) and decommissioning of the Project. The final selection of facilities required for the Project has not yet been determined. Since it is not possible, at this stage, to provide an assessment based on firm locations, an Economic Study Area has been defined based on the labour market catchment areas (60 minute drive-time catchments) around four locations considered as representative of the type of locations that may, with appropriate development and investment, be able to support the offshore wind sector. These locations are Leith (Edinburgh), Rosyth (Fife), Dundee and the Cromarty Firth (Highland).

14 To fully illustrate the nature of the impacts and effects of the Project the assessment also considers shorter drive times (30 and 45 minutes) within each labour market catchment area. Figure 22.1 shows the Economic Study Area in relation to the four representative locations. Further data on each of these areas is presented in *Appendix 22A*. The baseline and assessment for the Cromarty Firth use statistics centred on Invergordon but are considered illustrative for the surrounding area which includes facilities such as Nigg and Ardersier.

15 Selection of actual facilities will be subject to ongoing engineering and procurement considerations and the use of representative facilities for the purposes of this assessment does not indicate any preference or imply any decision.

Figure 22.1: Illustration of Economic Study Area and Labour Market Catchment Areas



16 The four labour market catchment areas that collectively form the Economic Study Area cross local authority boundaries within Scotland. Relevant local authority areas are Edinburgh, the Lothians, North Lanarkshire, Falkirk, Fife, City of Dundee, Angus, Aberdeen City, Aberdeenshire, Moray, Highland, Perth & Kinross, Stirling, Clackmannanshire, Falkirk, East Dunbartonshire, Glasgow City, North Lanarkshire, South Lanarkshire and the Scottish Borders. Statistics are used where relevant for these local authority areas to provide baseline information.

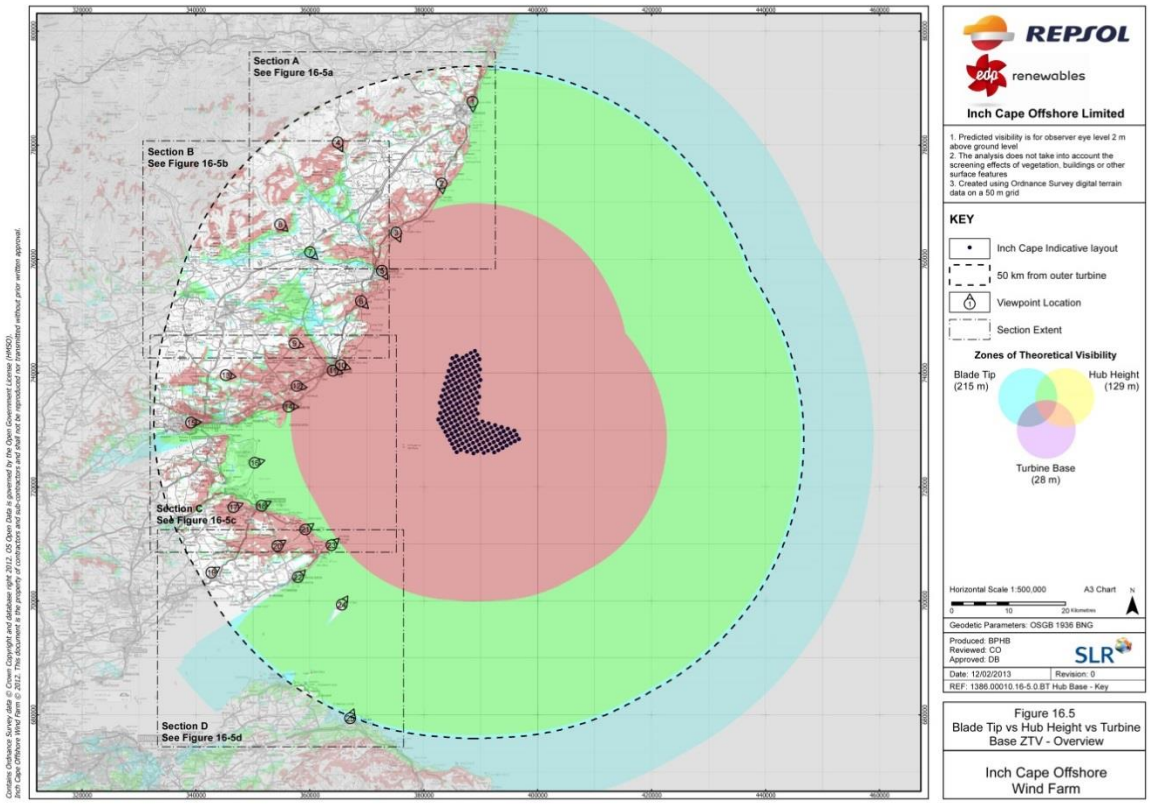
17 The impacts and effects identified through the assessment are set within the wider context of the Scottish economy as a whole. Assessments at a Scottish level are used for cumulative assessment since impacts can be meaningfully combined at this level and cannot be combined at Economic Study Area level since these are unique for each project.

22.4.2 Definition of the Tourism Study Area

18 The Tourism Study Area for assessment has been defined following consideration of the potential for visual effects that may arise from the Project and is therefore different to the Economic Study Area.

19 The Tourism Study Area has been defined as the areas where the Project may be seen from land, namely parts of the local authority areas of East Lothian, Fife, City of Dundee, Angus and Aberdeenshire as defined by the Zone of Theoretical Visibility (ZTV) produced for *Chapter 16*. Statistics are used where relevant for local authority areas to provide baseline information and from tourism areas as defined by VisitScotland. The boundaries of local authority areas and tourism areas are different however, in combination, provide the best available data.

Figure 22.2: Tourism Study Area Based On ZTV (Figure 16.5)



22.4.3 Guidance and Methods

20 The following relevant guidance documents have informed the baseline data collection, identification of impacts, mitigation and assessment of residual economic and tourism effects respectively:

- *The Green Book Appraisal and Evaluation in Central Government* (HM Treasury, 2003).
- *Additionality & Economic Impact Assessment Guidance Note* (Scottish Enterprise, 2008).
- *The economic impacts of wind farms on Scottish tourism* (Scottish Government, 2008).

- *Assessing Impacts on Tourism* (Good Practice Wind, 2012).

21 A full list of relevant documents and references is provided in *Appendix 22A* (*Section 22A.2*).

22.4.4 Data Sources

22 The following data and archives were consulted during the desk-based assessment, and full details are provided in *Appendix 22A*:

- NOMIS the Office for National Statistics website; and
- Other individual research, reports, and surveys referenced at the end of this chapter.

22.4.5 Methodology

23 Potential impacts from the construction, operation and decommissioning of the Project are identified and their significance assessed with regard to the sensitivity of receptors and the magnitude of the effect.

24 The methodology used to estimate the economic impacts of the Project follows the guidance set out in the HM Treasury's Green Book (2003) and Scottish Enterprise (SE) Additionality & Economic Impact Assessment Guidance Note (2008). Instruction within existing Scottish policy and guidance documents in relation to the specific format of socio-economic assessments has been considered. In addition this chapter incorporates the approach used in England and Wales for the socio-economic impact assessment of offshore wind farms within the Overarching National Policy Statement for Energy (NPS) (EN-1) (Department of Energy and Climate Change, 2011).

25 In defining the requirement for an Environmental Statement (ES) for projects subject to the European *Environmental Impact Assessment (EIA) Directive* (85/337/EEC), NPS EN-1 states that *"while not required by the EIA Directive, the IPC will find it helpful if the applicant also sets out information on the likely significant social and economic effects of the development, and shows how any likely significant negative effects would be avoided or mitigated."*

26 The NPS also defines what impacts may need to be considered. These are as follows:

- Creation of jobs and training opportunities;
- Provision of additional local services and improvements to local infrastructure;
- Effects on tourism;
- Impact of a changing influx of workers during the different construction, operation and decommissioning phases; and
- Consideration of cumulative effects.

27 The socio-economic impact assessment covers those impacts as stated, and also the likely impacts on the following:

- Population and labour market issues;

- Employment and businesses by sector including tourism;
- Travel-to-work and drive-time analysis;
- Productivity and Gross Value Added (GVA);
- Skills and Training; and
- Recreation and tourist resources.

28 In considering these impacts, this socio-economic impact assessment establishes the potential nature and scale of economic impacts generated by the Project, by reference to a number of best practice and research documents as set out in this chapter. Use is also made of industry experience of existing and emerging offshore wind schemes. In addition, the outputs generated by the Project are set within the context of the baseline capacity and capability of the Economic Study Area to absorb and benefit from these impacts.

29 The nature and scale of impacts are assessed by reference to a series of socio-economic significance criteria and also by temporal phase of development, namely those impacts arising from the construction, O&M and decommissioning phases of the Project. Information from the baseline relating to infrastructural strengthening has also been used to prepare this assessment.

30 The principal socio-economic assessment criteria relate to the impact on employment within the Economic Study Area. These impacts are defined in terms of Full-Time Equivalent (FTE) jobs and economic output measured by the Gross Value Added (GVA) generated by those jobs. The assessment outputs are therefore focussed on the following categories:

- Direct economic impacts: jobs and GVA that are wholly or largely related to construction, O&M, and decommissioning of the Project, which are generated in the Economic Study Area;
- Indirect economic impacts: jobs and GVA generated in the economy of the Economic Study Area in the chain of suppliers of goods and services to the direct activities;
- Induced economic impacts: jobs and GVA created by direct and indirect employees' spending in the Economic Study Area or in the wider economy; and
- Wider economic (catalytic) impacts: employment and income generated in the economy related to the wider role of the Project in influencing economic activities including wider socio-economic impacts. This will include the impacts on the tourism sector, on inward investment elsewhere within the construction sector (e.g. as a result of worker supply), and on other sectors of the economy.

31 The potential for cumulative impacts has been examined where relevant, and where data were available for the in-combination impact of the Project, together with the relevant projects off the east coast of Scotland.

22.4.6 Significance Criteria

32 For the purposes of this impact assessment the main factors considered relevant when defining the sensitivity of receptors are outlined in Table 22.2 for economics and Table 22.3 for tourism.

33 For economic impacts and effects, including employment, the availability of labour and skills is critical in being able to accommodate the demands, needs and requirements of the Project. Adequate capacity results in a low sensitivity, while conversely limited capacity results in a high sensitivity.

Table 22.2: Receptor Sensitivity (Economics)

Sensitivity	Definition
High	Where there is a low availability of labour and skills
Moderate	Where there is a constrained supply of labour and skills
Low	Where there is a readily available labour force and skills

34 For the purposes of tourism sensitivity the status of the receptor or resource is the defining factor in determining the level of sensitivity, where a higher level of status is assumed to attract more visitors or will be more sensitive to adverse change (such as a National Park).

Table 22.3: Receptor Sensitivity (Tourism)

Sensitivity	Definition
High	Where the receptor or resource is defined as being of International or National status or formal designation
Moderate	Where the receptor or resource is defined as being of regional status or formal designation
Low	Where the receptor or resource is defined as being of local status or formal designation

35 A level of impact significance has been ascribed based on the information on both Project socio-economic outputs and also the baseline structure of the relevant study area.

36 The magnitude of the effect of potential impacts on socio-economic receptors will be assessed as defined in 22.4 (Economic) and Table 22.5 (Tourism) below.

Table 22.4: Factors in the Assessment of Magnitude of Effect (Economic)

Magnitude	Factors in the assessment of the magnitude of effect
High	Impacts of the project of greater than local scale
Moderate	Noticeable impacts of the project that may be judged to be important at a local scale
Low	Slight impacts of the project that may be judged to be of minor importance
Negligible	Where impact is not discernible

Table 22.5: Factors in the Assessment of Magnitude of Effect (Tourism)

Magnitude	Factors in the assessment of the magnitude of effect
High	Where the extent of impacts on receptors (activities, resources, or businesses) is large scale and a large number of people or activities will be affected; or where there is an obvious view of the Project with potential to cause significant impact
Moderate	Where the extent of impacts on receptors is small in scale, but a large number of people or activities will be affected; or alternatively this will be where the extent of impacts on activities, resources and/or businesses is large in scale but only a small number of people or activities will be affected
Low	Where the extent of impacts on receptors is small in scale and will only affect a small number of people or activities; or where the Project would be unlikely to be visible (as it would be obscured by hills or woodland, etc) or would be at a distance, therefore if there were any impact it would be minor
Negligible	Where impacts on receptors would be negligible

37 In line with standard EIA practice, the sensitivity of receptors, as defined in Table 22.2 Receptor Sensitivity (Economics) and Table 22.3 Receptor Sensitivity (Tourism) are considered against the magnitude of effect (Tables 22.4 and 22.5) to determine the significance of impact (see Table 4.6).

22.5 Project Design and Embedded Mitigation

38 At this stage of the Project, ICOL are actively exploring Scottish ports, facilities, supporting infrastructure and labour markets to understand the potential capability, capacity and availability of each. Subject to these factors, the most likely scenario is that a port or a range of ports and facilities along the east coast of Scotland will be used to support elements of the construction, O&M, and decommissioning phases of the Project as part of a global supply chain. It is likely that ports and facilities nearer the Development Area will be used to support O&M for the Project.

39 A range of Embedded Mitigation measures to minimise environmental effects are captured within the Design Envelope (see *Section 4.5.2*). The assessment of effects on socio-economics and tourism has taken account of the following Embedded Mitigation measures:

40 ICOL will support a protocol to give local contractors the opportunity to tender for work arising from the Project capital and operational expenditures. The protocol will ensure that local contractors with the relevant skills and experience will be able to access the procurement process through "meet the buyer" events and other initiatives.

41 ICOL has worked closely with Scottish economic development agencies to promote opportunities since the inception of the Project and this approach will continue throughout the Project life.

42 These measures would be delivered as part of the Project Environmental Mangagement Plan (EMP) (see *Appendix 7A: Draft Environmental Management Plan*).

22.6 Baseline Environment

22.6.1 Current Socio-economic Conditions

43 The baseline conditions have been identified using the data sources identified in *Section 22.4.3* and *Appendix 22A* to provide a review of current socio-economic conditions in the Economic Study Area, defined in *Section 22.4.1* above.

Population and Age Structure

44 The population across the Economic Study Area has grown between the last two Census dates of 2001 and 2011, most notably in the City of Edinburgh and Aberdeenshire. Similarly the City of Edinburgh and Aberdeen City are the only authorities in the Economic Study Area, which have a higher than average proportion of working age people. Areas which have a notably higher dependency ratio include Angus and East Lothian. The dependency ratio or proportion of working age people is important as it measures the relationship between the productive element of a population and the economically dependent.

Economic Activity

45 The economic activity rate measures the percentage of the population, both in employment and unemployed that represent the labour supply, and hence is a useful measure of the labour market opportunities available to the population, with Aberdeen City and Aberdeenshire higher than the Scottish average, and Dundee City markedly lower than average.

Employment Structure

46 The City of Edinburgh, Aberdeen City and Aberdeenshire have a higher than average proportion of highly skilled workers, while for skilled workers the majority of the Economic Study Area is comparable to the Scottish average. Dundee City has the highest proportion of

unskilled workers, while City of Edinburgh and Angus have the lowest proportions of unskilled workers in the Economic Study Area.

Job Density

47 Job density measures the number of jobs for every resident (each aged 16 – 64 years). Aberdeen City, City of Edinburgh and Dundee City have job densities higher than the Scottish average, while the remaining local authorities in the Economic Study Area have job densities below the Scottish average.

Industry Structure

48 Angus, Aberdeenshire, Fife and Dundee City have an above Scottish average proportion of manufacturing jobs, while only Aberdeenshire and East Lothian have an above average proportion of construction jobs in the Economic Study Area. In the tourism sector, City of Edinburgh, Angus, East Lothian, and Fife have an above average proportion of service jobs, with the other areas close to or below the Scottish average.

Unemployment (Job Seekers Allowance)

49 In the Economic Study Area, Job Seeker Allowance claimant count rates were highest in Dundee City and Fife, whereas the areas of Aberdeenshire, Aberdeen City (recording the lowest levels), Angus, East Lothian, and City of Edinburgh were below the Scottish average.

Qualifications

50 City of Edinburgh, Aberdeen City, Angus, and Aberdeenshire have higher than the Scottish average for educational and qualification attainment level (Degree, HND and Highers).

Earnings

51 Residents of Aberdeen City, Aberdeenshire, City of Edinburgh, and East Lothian received higher salaries than the Scottish average. Dundee City, Angus and Fife each have salaries below the Scottish average.

Business Health

52 Data show that City of Edinburgh, Aberdeenshire, and Fife have particularly high stocks of VAT registered businesses providing a useful indication of the pattern of business start-ups and closures, and a useful indicator of the level of entrepreneurship and health of the business population in the Economic Study Area. Further, registrations exceeded de-registrations in each area contributing to an overall increase in the stock of businesses based on the most recent 2007 data.

22.6.2 Gross-Value Added Economic Output

53 GVA measures the contribution to the economy of each industry sector. Within the Economic Study Area, those locations with an above average industry representation include Aberdeen City, which contributed a major share of Scotland's total for primary industries (75

per cent), which are defined as those industries involved in the extraction and collection of natural resources such as hydrocarbons, and also includes forestry, farming and fisheries, and Fife (8.1 per cent) for manufacturing, while the City of Edinburgh accounted for nearly a third (29 per cent) of Scotland's services GVA. These GVA percentages are highlighted to illustrate the key industry strengths of each of these locations.

22.6.3 Labour Market Catchments

As detailed in *Section 22.4.1*, the locations used for this assessment (Leith, Rosyth, Dundee, and the Cromarty Firth) are considered representative of those that have potential to provide services for the Project across the certain phases. Drive-time catchments of 30, 45 and 60 minutes cover the travel-to-work areas from where the majority of workers would be drawn. Generally the drive-time catchments are very similar in structure and profile to those of the local authority areas as set out in the baseline environment description above.

22.6.4 Tourism Baseline Profile

54 The Tourism Study Area is relatively healthy in tourism terms, with occupancy rates for hoteliers and proprietors of Bed and Breakfasts, guesthouses and self-catering accommodation being relatively high throughout the year.

55 The majority of visitors to the regions that cover the Tourism Study Area, based on data from VisitScotland, are both domestic and overseas and come for a holiday stay, with the exception being Aberdeen and Grampians, where a high number of overseas visitors come for business purposes.

56 The tourism market of the Tourism Study Area, as a whole, is more dependent on visitors from the UK as they account for the majority of tourism expenditure received. Between 2010 and 2011 there were increases in domestic tourist trips and expenditure recorded in Edinburgh and the Lothians of 19 per cent to 2.75 million trips and in expenditure of 17 per cent to £616 million, and in Aberdeen and the Grampians of 22 per cent to 1.37 million trips and in expenditure of 29 per cent to £260 million, while over the same period Fife experienced a fall in trips (of -25 per cent to 0.43 million) and expenditure (of -8.0 per cent to £74 million). Dundee and Angus experienced a mixed situation with a fall in domestic tourism expenditure of 6.0 per cent to £82 million but an increase in trips by 29 per cent to 0.66 million. Visitors from England are extremely important within the Tourism Study Area as they make up the majority of visitors and spend the most money. The Edinburgh and Lothians and Aberdeen and Grampians regions play an important role in the domestic tourism market, as collectively they account for approximately a third of total trips and expenditure across Scotland.

57 A wide range of overseas tourists, from across the world, visit the various parts of the Tourism Study Area. In the Lothians (69 per cent of trips and 92 per cent of expenditure) and the Grampians (34 per cent of trips and 48 per cent of expenditure) the 'rest of the world' sector makes up the majority of visitors, whilst in Fife visitors from the United States of America contribute most, in terms of 26 per cent of trips and 25 per cent of expenditure.

In Dundee and Angus, visitors from the 'rest of the world' now account for 25 per cent of both trips and expenditure.

58 A number of main visitor attractions located in Fife, Dundee and Angus, namely the Scottish Fisheries Museum (Anstruther), St Andrews Museum, British Golf Museum, Dundee Contemporary Arts, Monikie Country Park, the McManus: Dundee's Art Gallery and Museum, and Crombie Country Park are within 50 kilometres (km) of the Development Area.

22.6.5 Current Offshore Initiatives

There is a wide range of business and infrastructure initiatives, being implemented across Scotland, designed to enhance the capacity and capability of facilities and the supply chain. These range from business and industry networks (Aberdeen Renewable Energy Group, in Aberdeen, Dundee Renewables, and Fife Renewables), through infrastructural strengthening (development of Port of Leith as Scotland's 21st Century Gateway Port and offshore wind manufacturing and deployment hub, and the upgrading of ports of Dundee and Methil), to developing focal points of investment (Energetica and Rosyth Waterfront).

59 Added to these initiatives a number of multi-national energy sector companies have located within the Economic Study Area and in other parts of Scotland. Interest has also been expressed by wind turbine manufacturers (Gamesa, Samsung, Areva, and Mitsubishi Heavy Industries amongst others) in establishing facilities within the Economic Study Area or in other parts of Scotland that may in time also attract tier 2 component suppliers. All of these capability and capacity strengthening measures are supported by a government strategy and policy framework which targets the offshore wind industry as a key economic sector.

22.6.6 Education and Training

60 Part of the business infrastructure necessary to exploit the opportunities from the offshore industry is the network of education, training and skills facilities within the Economic Study Area that would provide the requisite skilled labour force, upon which extensive development of the offshore wind industry will be reliant. These range from the higher education university, centres of excellence, and research institutions focal points in Edinburgh, Dundee, St Andrews and Aberdeen, together with the network of colleges across the Economic Study Area.

61 The training infrastructure within the Economic Study Area includes several partnerships and organisations including Skills Development Scotland, Tresta, and Energy Training East amongst others. In addition, the Scottish Government aims to provide 2,000 apprenticeships specifically for the energy and climate change industries between 2011 and 2015, for example through the Nigg Skills Academy.

22.6.7 Ex-Post (post-development) Tourism Assessment

62 To date there has been very little research into the effects of offshore wind development on tourism in the UK. This chapter includes the results of research produced specifically for this assessment into the post-development tourism impact from eight existing and operational

Round 1 offshore wind farms which commenced operation over the period from 2005 to 2009.

63 These offshore projects were also selected on the basis of their proximity to the shore being in the range 2.3 km – 12.8 km, to emphasise their visibility from onshore. Table 22.6 provides details of the projects.

Table 22.6: Operational Round 1 Offshore Wind Farms (2012)

Wind Farm	Start Date of Operation	Output MW	Distance offshore (km)	Onshore Tourism District or Focus Area
Robin Rigg	September 2009	180	11.0 - 11.5	Dumfries and Galloway and North Cumbria
Barrow	March 2006	90	7.5 - 12.8	Lake District National Park
Burbo Bank	July 2007	90	6.4 - 8.0	Merseyside
Rhyl Flats	December 2009	90	8.0 - 10.7	Colwyn Bay and Rhyl
Kentish Flats	June 2005	90	8.5 - 9.8	Herne Bay and Kent
Lynn	March 2009	97.2	5.0 - 6.9	South Lincolnshire
Inner Dowsing	March 2009	97.2	5.0 - 6.3	South Lincolnshire
Scroby Sands	July 2004	60	2.3 - 3.5	Norfolk and East Anglia

64 This post-development assessment reviewed the potential impacts and effects from the perspective of the three distinct phases of development: pre-construction, construction and post construction.

65 The general conclusion from the post-development assessment of the impact of the offshore wind farms on domestic tourism volume was that the local onshore areas had not been negatively affected by the presence and visibility of the offshore wind farms. In most cases the volume of tourism actually increased over time. Of particular note, is that Scroby Sands offshore wind farm visitor centre, in Great Yarmouth, has become a major tourist attraction in itself.

66 Where a decrease in tourism volume has occurred, particularly between 2007 and 2009, this is most likely to have been a consequence of above average rainfall over peak holiday seasons, combined with the economic recession over the same period. Full details of this assessment are included in *Appendix 22A, Section 22A.6.*

22.7 Scope of Assessment

67 This section considers the source and nature of the effects of the Project on the Economic Study Area. The impact assessment is considered in relation to the construction, operational and decommissioning phases. Values are presented for the Economic Study Area, the 'rest of Scotland', the 'rest of the UK' and the balance as the 'rest of the World'.

22.7.1 Estimation of Construction Employment and Economic Output

Construction Scenarios

68 ICOL has estimated the offshore capital expenditure (CAPEX); operating expenditure (OPEX) and decommissioning expenditure by region, as set out in Table 22.7, based on the following 'Base' and 'High' scenarios.

- Base socio-economic scenario – moderate supply chain capacity capable of supplying around 12 per cent of whole life expenditures from within the Economic Study Area, a further 9.0 per cent from the rest of Scotland and a further 17 per cent from within the rest of the UK; and
- High socio-economic scenario – a more developed supply chain capable of supplying around 33 per cent of whole life expenditures from the Economic Study Area, a further 14 per cent from the rest of Scotland and a further 25 per cent from the rest of the UK.

Table 22.7: Project Offshore Expenditure Estimates by Scenario (£ million)

Base Socio-economic scenario					High Socio-economic scenario			
	Economic Study Area	Rest of Scotland	Rest of UK	Rest of the World	Economic Study Area	Rest of Scotland	Rest of UK	Rest of the World
CAPEX	£314.5	£25.6	£456.0	£2,740.0	£1,005.4	£177.9	£969.5	£1,383.4
OPEX	£529.8	£599.6	£739.4	£1,381.3	£1,248.0	£872.6	£710.1	£419.3
Decommissioning	£75.1	£61.0	£61.0	£412.9	£197.1	£14.1	£136.1	£262.7
TOTAL	**£919.4**	**£686.2**	**£1,256.4**	**£4,534.2**	**£2,450.5**	**£1,064.6**	**£1,815.7**	**£2,065.4**
As a % of Each Region ***(figures rounded)***								
CAPEX	34%	4%	36%	60%	41%	17%	53%	67%
OPEX	58%	87%	59%	30%	51%	82%	39%	20%
Decommissioning	8%	9%	5%	9%	8%	1%	7%	13%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
As a % of Total Expenditure ***(figures rounded)***								
CAPEX	9%	1%	13%	77%	28%	5%	27%	39%
OPEX	16%	18%	23%	43%	38%	27%	22%	13%
Decommissioning	12%	10%	10%	68%	32%	2%	22%	43%
TOTAL	**12%**	**9%**	**17%**	**61%**	**33%**	**14%**	**25%**	**28%**

69 These 'Base' and 'High' scenarios have been considered in relation to the assessment of the socio-economic effects arising from the Project through its life. These scenarios reflect two key considerations; firstly that the design of the Wind Farm and Offshore Transmission Works remains within a design envelope and therefore the nature of goods and services procured will vary; and secondly that the capacity, capability and availability of the supply chain to support the Project is subject to change. Other offshore wind farm projects may also be developed and procured in a similar time period and this will also affect the supply chain locally and on a wider basis.

70 Businesses have the potential to diversify and grow by moving into new markets including the offshore wind industry. Businesses in the UK, Scotland, and in particular in the Economic Study Area are well positioned to attract a proportion of expenditure from offshore wind farm projects due to the existing skills base that could assist in the delivery of the Scottish Territorial Waters (STW) and Round 3 offshore wind farm projects, however this requires businesses to offer both technically and commercially competitive propositions. There is potential for successful businesses to export goods and services to other offshore wind farm projects on a global basis.

71 The baseline assessment shows that there is currently an economically active, skilled and semi-skilled workforce in the Economic Study Area, with the capacity for retraining and up-skilling at all levels. This pool of potential labour and skills will have the capacity to act as a labour market resource, upon which the Project can draw its labour market requirements in the construction, O&M and decommissioning phases.

72 Information on major suppliers for several offshore wind farms constructed or currently under construction has been collated. This is presented in Table 22.8 below and shows that on average the proportion of construction cost spent in the UK is approximately 23 per cent. The Gwynt y Môr Offshore Wind Farm value is based on economic impact assessment estimates that indicate around 13 per cent of all construction jobs would be created in the UK economy. A greater proportion of UK businesses were engaged in the supply chain for the Ormonde Offshore Wind Farm with 20 per cent of the development costs being spent on Wind Turbine Generator (WTG) foundations which were manufactured by Burntisland Fabrications Ltd (BiFab) based in Scotland.

73 The 'Base' impact scenario of 21 per cent UK business share estimated by ICOL is in line with recent trends.

Table 22.8: Proportion of Expenditure in the UK by Offshore Wind Construction Projects

Offshore Wind Farm	Approximate Share of Costs Spent in the UK	Wind Farm Capacities (MW)
Sheringham Shoal	21%	317
Ormonde	31%	150
Walney Phase I	19%	184
Greater Gabbard	18%	504
Gwynt y Môr	13%	576
Thanet	28%	300
Robin Rigg	31%	180
Average	**23%**	**316**

74 The drivers for the 'High' impact scenario assumptions by type of expenditure are as follows:

- The majority of consultancy services for current projects are provided by UK businesses, with the share of UK businesses in consultancy services up to 100 per cent;
- Share of UK businesses in offshore WTG manufacturing could increase by the time of construction of the Project driven by potential manufacturing facilities at Hull Green Port (Siemens), Port of Leith (Gamesa), Methil (Samsung Heavy Industries), and at so far

unspecified locations (Areva and Mitsubishi Heavy Industries). However UK manufacturing facilities, if established, will still import a proportion of raw materials, components and related services from Europe and/or elsewhere;

- A majority of substructures/foundations could be sourced within the UK. This has been achieved in previous projects and there is current capacity in Scotland and in the north east of England. It is possible that other foundation manufacturers may invest and locate in the east of Scotland to exploit the available and emerging STW and Round 3 opportunities in the North Sea;
- Share of UK businesses in manufacturing and installation of cables and substations could increase from a relatively limited base. A number of UK businesses are already involved e.g. JDR Cables at Hartlepool and SLP Engineering located at Lowestoft. Others such as Babcock at Rosyth are targeting substation fabrication work. While it is expected that the UK share may increase there will also be competition from well-established European suppliers; and
- An increasing number of UK businesses could become involved in installation and commissioning of offshore wind farms. At present the share of UK businesses in installation and commissioning activities is estimated to vary between 23 per cent (Gwynt y Mor) and 57 per cent (Walney Phase 1). Factors affecting the UK share include installation method, and therefore types of vessels, as well as the location of selected contractors and onshore support facilities. New installation methods are under development and new vessels are already entering the market place. It is expected that innovation will provide opportunities to new suppliers and that development of suitable UK port facilities will also reduce constraints to supply from the UK. While it is expected that the UK share may increase there will also be competition from well-established European bases and suppliers.

Construction Occupations and Skills

75 Construction phase activities will require a diverse set of professions and skills. A recent report (*Working for a Green Britain – Employment and Skills in the UK Wind and Marine Industry* (Renewable UK, 2011)) indicates that employees who would be directly employed during the pre-construction and construction phases may be distributed as follows:

- Planning and Development, 15 per cent;
- Design and Manufacturing, 7 per cent;
- Construction and Installation, 41 per cent;
- Operations and maintenance, 17 per cent; and
- Support services/other, 20 per cent.

22.7.2 Estimation of Gross Direct and Net Additional Construction Employment

76 The number of construction jobs required has been estimated using available information and comparable project experience using the following methodology.

Methodology

77 The methodology sets out the means of estimation of the net additional construction impacts of the Project and the definitions and values of the factors involved. The net additional impact measures the net result, taking account of deadweight, leakage, displacement, substitution and economic multipliers.

78 The 'no project' scenario effects are assumed to be zero; as without the Project no impacts would result.

79 Leakage is defined as those jobs taken up by people from outside a specific area, e.g. Economic Study Area, rest of Scotland and rest of UK, and is set out in Table 22.9. Leakage rates out of the Economic Study Area in the 'Base' impact scenario are expected to be very low (nine per cent) and considerably greater in the high impact scenario (28 per cent). However there is less leakage out of the UK as a whole to overseas in the 'High' impact scenario (39 per cent) compared to the 'Base' impact scenario (77 per cent).

80 Displacement effects within the Economic Study Area's business infrastructure are expected to be very low due to the limited numbers of manufacturing businesses currently operating within and providing components for the offshore wind industry. If business involvement expands through additional investment, the capacity of industry to supply the needs of the Project would also develop through up-skilling and importation of labour to address the requirements.

81 A multiplier value from the recent Centre for Economics and Business Research (CEBR) scenario based assessment of the economic impact on the UK of alternative options for the realisation of offshore wind capability (Report for Mainstream Renewable Power *The Macroeconomic Benefits of Investment in Offshore Wind* (CEBR 2012)) has been used to establish the level of downstream indirect and induced employment that would be generated as a result of the direct construction arising from the Project. This multiplier value estimates that 1.41 indirect and induced jobs would be created elsewhere in the economy for every one FTE direct construction job.

Employment and GVA Impacts

82 A range of scenarios has been considered that may affect Project design and construction methods and therefore the number of construction jobs have been set out separately as 'High' and 'Base' supply chain scenarios. The number of construction FTE jobs created in total is estimated at 2,244 for the offshore elements of the project. This is based on an assumed Project size of approximately 1050 MW although it should be noted that economics impacts are related to the scale and nature of procurement, construction and operations associated with the required infrastructure rather than the specific electrical

output of the Wind Farm. A potential geographic distribution of these jobs has been estimated for the 'Base' and 'High' scenarios based on analysis of the existing supply chain and where there is potential for growth respectively, as described above.

83 Depending on the impact scenario the proportion of the Project expenditure spent in the Economic Study Area, rest of Scotland, and rest of UK could potentially create between 200 FTE direct jobs and 638 direct FTE jobs at an Economic Study Area level, between a further 16 and 113 FTE direct jobs in the rest of Scotland, and between a further 289 and 615 FTE direct jobs in the rest of UK, as shown in Table 22.9 below.

Table 22.9: Construction Phase Gross Direct Employment and Leakage Effects

	Low Impact		High Impact	
Leakage effects	**No. of FTE Jobs**	**% of Total**	**No. of FTE Jobs**	**% of Total**
Economic Study Area	200	9%	638	28%
Rest of Scotland	16	1%	113	5%
Rest of UK	289	13%	615	27%
Overseas	1,739	77%	878	39%
Total	**2,244**	**100%**	**2,244**	**100%**

84 As shown below in Table 22.10 net additional employment from the Project is estimated to be between 457 FTE and 1,384 FTE direct, indirect and induced construction jobs at an Economic Study Area level for the 'Base' and 'High' scenarios respectively. For the rest of Scotland net additional employment from the Project is estimated to be between 37 FTE and 245 FTE direct, indirect and induced construction jobs for the 'Base' and 'High' scenarios respectively. Net additional employment in the Rest of UK is estimated to be between 663 FTE and 1,335 FTE direct, indirect and induced jobs. This gives an overall total of between 1,157 and 2,964 net additional direct, indirect and induced FTE construction jobs in the UK.

85 Using an average GVA per employee value for Scotland of £64,000, the net additional jobs represent between £28.4 million and £86.1 million GVA per annum at an Economic Study Area level, and between £72.0 million and £184.4 million throughout the UK as a whole as set out in Table 22.10.

86 Construction job estimates have also been compared against recent industry research 'Report for Mainstream Renewable Power *The macroeconomic benefits of investment in offshore wind* (CEBR, 2012) which provides industry average benchmarks for offshore wind development using three varying scenarios: 'slow progression' (low), 'gone green' (medium) and 'accelerated growth' (high).

87 ICOL construction estimates are within 10 per cent of these industry average benchmarks.

Table 22.10: Construction Phase Direct and Net Additional Employment and GVA

	Base Impact		High Impact	
Employment	No. of FTE Jobs	Displacement and Multiplier	No. of FTE Jobs	Displacement and Multiplier
Economic Study Area				
Direct FTE jobs	200		638	
Displacement effect	10	5%	64	10%
Net Additional local jobs	190		574	
Multiplier effect	267	1.41	810	1.41
Net Additional Economic Study Area	***457***		***1,384***	
Rest of Scotland				
Direct FTE jobs	16		113	
Displacement effect	1	5%	11	10%
Net Additional local jobs	15		102	
Multiplier effect	22	1.41	143	1.41
Total Net Additional Rest of Scotland	***37***		***245***	
Total Scotland Jobs	***494***		***1,629***	
Rest of UK				
Direct FTE jobs	289		615	
Displacement effect	14	5%	62	10%
Net Additional local jobs	275		554	
Multiplier effect	388	1.41	781	1.41
Total Net Additional Rest UK jobs	***663***		***1,335***	
Total UK Jobs	***1,157***		***2,964***	
GVA Per Annum	**£m p.a.**		**£m p.a.**	
Economic Study Area	£28.4		£86.1	
Scotland Total	£30.8		£101.3	
Rest of UK	£41.2		£83.0	
UK Total	£72.0		£184.4	
GVA Total CAPEX	**£m**		**£m**	
Economic Study Area	£142		£431	
Scotland Total	£154		£507	
Rest of UK	£206		£415	
UK Total	£360		£922	

22.7.3 Estimation of Operation and Maintenance Employment and Economic Output

Gross and Net Operation and Maintenance Employment

88 This analysis is based upon a shore-based O&M approach primarily using small service craft for access with limited helicopter access. There are alternatives approaches that include increased use of helicopters or the use of a mothership. Each scenario will generate different economic benefits within the Economic Study Area and the rest of the UK.

89 The shore-based operation would require a nearby port to support vessel operations and include base facilities for maintenance crew carrying out planned and unplanned maintenance and repair. Support facilities would be required such as a helipad, warehousing for consumables and equipment, mechanical/electrical workshop, personnel welfare, catering and associated parking.

90 ICOL estimates of direct O&M activities indicate that there would be between 72 and 104 onshore based FTE jobs.

91 The net additional employment which would result from this level of direct employment would be between 117 and 169 FTE jobs, as set out in Table 22.11. This assumes that there would be zero dead-weight effect due to the unique nature of the Project in the area, that leakage of labour out of the Study Area would be limited at 10 per cent, and that displacement would be higher but still relatively limited at around 25 per cent. This would result from potential constraints on the level of appropriately qualified and skilled people within the Study Area and wider Scottish labour force, upon which the Project would draw. As a consequence, the Project may draw in skilled labour from outside the Study Area, and also attract labour from existing economic activities within the Study Area. This net additional employment would represent new GVA at a Study Area level of £7.3 million to £10.5 million per annum and £15.6 million and £22.4 million per annum for the 'Base' and 'High' case for Scotland as a whole.

Table 22.11: Operation & Maintenance Phase Direct and Net Additional Employment

	Factor	Base FTE Jobs	High FTE Jobs
Direct FTE jobs		72	104
Dead-weight effect	Reduce by 0%	72	104
Leakage effect	Reduce by 10%	65	94
Displacement effect	Reduce by 25%	49	70
Multiplier effect	1.41	68	99
Net Additional FTE		**117**	**169**

22.7.4 Estimation of Decommissioning Employment and Economic Output

92 Decommissioning of the Project would take place once the components of the Project had reached their economic end of life and include the removal of WTGs, offshore substations and foundations. Cables may be disconnected and left *in situ*. The following generic activities may be required during the decommissioning phase:

- Project Management;
- WTG removal;
- Substructure/Foundation removal;
- Associated Port activities;
- Beneficial use or disposal of materials; and
- Sub-sea survey on completion.

93 The estimated number of decommissioning jobs is likely to be lower than construction. Decommissioning work offshore will generally reverse the installation work and recover structures to shore. It is estimated there would be approximately 50 full time personnel involved in managing the activities and a further 1,000 temporary personnel. The decommissioning phase is estimated to take approximately 12 to 18 months for removal activities and therefore provide approximately 200 FTE jobs.

22.8 Impacts on Baseline Receptors

22.8.1 Construction Phase Economic Impacts

94 The potential employment impacts of the Project are considered here, within the context of the Economic Study Area labour market. The analysis is designed to provide an understanding of the potential scale of impacts generated by the Project and the degree to which the available labour market is able to accommodate such impacts.

95 Estimated construction phase impacts have been assessed against the current labour market, including working age population, economically active, and potentially available labour pool, as set out in the baseline assessment, for the Economic Study Area consisting of the 60 minute drive-time catchments centred on Leith, Rosyth, Dundee and the Cromarty Firth as representative potential locations for construction and deployment activities. Table 22.12 provides an illustration of the number of new jobs that could potentially be created by the Project relative to the workforce available within the 30 minute, 45 minute and 60 minute drive-time catchment of each labour market location.

Table 22.12: Construction Employment Scenarios versus Labour Market Scale

	Leith			Rosyth			Dundee			Cromarty Firth		
	30min	45min	60min	30min	45min	60min	30min	45min	60min	30min	45min	60min
Working age population	491,563	773,429	1,165,142	590,468	1,102,710	1,701,503	185,453	348,495	482,398	21,589	73,576	93,382
Economically active (16-74 years)	295,563	467,057	694,003	356,209	657,832	995,554	105,367	200,907	277,932	13,673	47,654	60,737
Potentially available labour pool	21,942	34,871	58,808	27,512	54,539	89,386	8,183	16,026	23,762	758	2,383	2,861
Manufacture and construction related workforce	51,931	114,459	195,891	90,416	182,329	294,607	36,004	68,759	97,671	4,841	12,820	16,077
Low scenario : Net Additional Jobs Total = 457												
As % of working age population	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.2%	0.1%	0.1%	2.1%	0.6%	0.5%
As % of economically active	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.4%	0.2%	0.2%	3.3%	1.0%	0.8%
As % of potentially available labour pool	2.1%	1.3%	0.8%	1.7%	0.8%	0.5%	5.6%	2.9%	1.9%	60.3%	19.2%	16.0%

	Leith			Rosyth			Dundee			Cromarty Firth		
	30min	45min	60min	30min	45min	60min	30min	45min	60min	30min	45min	60min
Manufacture and construction related workforce	0.9%	0.4%	0.2%	0.5%	0.3%	0.2%	1.3%	0.7%	0.5%	9.4%	3.6%	2.8%
High scenario : Net Additional Jobs Total = 1,384												
As % of working age population	0.3%	0.2%	0.1%	0.2%	0.1%	0.1%	0.7%	0.4%	0.3%	6.4%	1.9%	1.5%
As % of economically active	0.5%	0.3%	0.2%	0.4%	0.2%	0.1%	1.3%	0.7%	0.5%	10.1%	2.9%	2.3%
As % of potentially available labour pool	6.3%	4.0%	2.4%	5.0%	2.5%	1.5%	16.9%	8.6%	5.8%	182.6%	58.1%	48.4%
Manufacture and construction related workforce	2.7%	1.2%	0.7%	1.5%	0.8%	0.5%	3.8%	2.0%	1.4%	28.6%	10.8%	8.6%

96 The Cromarty Firth labour market area would experience an impact over a range of drive catchment areas, where the potentially available labour pool in each of the impact scenarios would experience a considerable demand. This is considered a moderate to major positive impact of 60.3 per cent, 19.2 per cent and 16 per cent of the total labour pool in the 'Base' scenario within the 30 minute, 45 minute and 60 minute drive catchment areas respectively. In the 'High' scenario the potentially available labour pool would experience a moderate to major positive impact with 182.6 per cent, 58.1 per cent, and 48.4 per cent of the total labour pool in the 'High' scenario within the 30 minute, 45 minute and 60 minute drive catchment areas respectively.

97 In the 'High' scenario, Dundee's labour markets would experience a moderate positive impact from the Project from demand for suitably skilled labour, but only within the 30 minute drive-time catchment. Due to the nature of the wider catchment, the impacts experienced in Leith and Rosyth labour market catchments would only be at a low or negligible level.

98 Given that the construction period would be temporary and that the nature of the skills required would include both specialist and general construction labour capabilities, this would likely require both the up-skilling of available labour and also the importation and attraction of additional labour into the area. This is not unusual for large construction projects during the construction works period, with a mobile and specialist workforce being attracted to such projects. In such circumstances this form of mobile workforce would generally be absorbed into the available accommodation facilities, in bed & breakfasts and similar cost-effective accommodation, benefitting this sector of the economy in addition to expenditure on goods and services in an area.

99 A proportion of this mobile labour force would also likely be attracted to remain on a more permanent basis, particularly where there is a prospect of on-going major project construction work along the east coast of Scotland related to other offshore wind farms.

22.8.2 Operation and Maintenance Phase Economic Impacts

100 Estimated O&M phase impacts have been assessed against the current labour market, as set out in the baseline assessment, for the labour market catchment areas around Leith, Dundee and Rosyth within the Economic Study Area. Cromarty Firth is not included in relation to O&M as it is considered too distant from the Development Area. In practice it is likely that while the large lay-down and marshalling areas required for the construction and deployment and decommissioning activities would be located at this type of location, smaller scale intermediate facilities, such as those at Montrose, Arbroath or Methil would be likely to accommodate the more limited scale required for O&M activities. The labour market catchment profile and structure of these intermediate facilities is broadly similar to that of Leith, Rosyth, and Dundee as they are within the labour market catchments.

101 Table 22.13 provides an illustration of the number of new jobs potentially created by the Project relative to the workforce available within the 30 minute, 45 minute and 60 minute drive-time catchment of each labour market location.

Table 22.13: Operation & Maintenance Employment Scenarios versus Labour Market Scale

	Leith			Rosyth			Dundee		
Drive time	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**
Working age population	491,563	773,429	1,165,142	590,468	1,102,710	1,701,503	185,453	348,495	482,398
Economically active (16-74 years)	295,563	467,057	694,003	356,209	657,832	995,554	105,367	200,907	277,932
Potentially available labour pool	21,942	34,871	58,808	27,512	54,539	89,386	8,183	16,026	23,762
Manufacture and construction related workforce	51,931	114,459	195,891	90,416	182,329	294,607	36,004	68,759	97,671
Base scenario : Net Additional Jobs Total = 117									
As % of working age population	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
As % of economically active	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
As % of potentially available labour pool	0.5%	0.3%	0.2%	0.4%	0.2%	0.1%	1.4%	0.7%	0.5%
Manufacture and construction related workforce	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.3%	0.2%	0.1%
High scenario : Net Additional Jobs Total = 169									
As % of working age population	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
As % of economically active	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.1%
As % of potentially available labour pool	0.8%	0.5%	0.3%	0.6%	0.3%	0.2%	2.1%	1.1%	0.7%
Manufacture and construction related workforce	0.3%	0.1%	0.1%	0.2%	0.1%	0.1%	0.5%	0.2%	0.2%

22.8.3 Decommissioning Phase Economic Impacts

102 Facilities at Leith, Dundee, Rosyth and in the Cromarty Firth are also considered representative of the type of facilities that could be utilised in the decommissioning phase. They could all accommodate and process structures removed from offshore although other facilities may also be required depending on capacity and availability within these facilities at the time of decommissioning. The nature of onshore activities will be different to the construction phase and will depend on how equipment and structures will be re-used or recycled for other purposes.

103 The estimated 1000 temporary decommissioning jobs (200 FTE) would have a minor impact in terms of Leith, Dundee or Rosyth. For the Cromarty Firth, however, the impact would potentially be moderate for the 'Base' scenario within a 30 minute drive-time catchment and moderate in each of the drive-time catchments in the 'High' scenario. This number of jobs would be readily absorbed locally through a mixture of locally based and temporarily accommodated imported labour over the limited timescale for the decommissioning phase. Thus, the creation of new, and safeguarding of existing jobs, would have a positive effect in economic terms and each job would be valuable to the Economic Study Area economy.

22.8.4 Tourism and Recreation Impact

104 The tourism impact assessment establishes the potential effects of the Project upon the surrounding area between East Lothian in the south and Aberdeenshire in the north.

105 The tourism impact assessment (see *Appendix 22A, Section 22A.5.1*) has identified a number of 'top visitor attractions' in the Tourism Study Area with potential visibility of the Project.

106 *Chapter 16* identifies a number of tourism and recreational receptors as being likely to experience significant major and moderate residual effects on visual amenity derived from the Project. The assessment and conclusions in *Chapter 16* relate to the effect on visual amenity of the receptor but not the tourist or recreational user receptors' behavioural response to the change in their visual amenity. The 'after the event' tourism impact assessment of eight existing Round 1 offshore wind farms (see *Appendix 22A Section 22A.6*) has demonstrated that none of these offshore developments has led to an adverse effect upon onshore tourism or recreational use in their onshore hinterlands. While the Round 1 projects are substantially smaller in scale (up to 54 WTGs) than the Project (213 WTGs) these comparator projects are also much closer to shore (2.3 km to 12.8 km offshore) than the Project (15 km – 22 km off shore).

107 Research undertaken on behalf of the Scottish Government *'The economic impacts of wind farms on Scottish tourism*' (Scottish Government 2008) found that, in relation to the impacts on tourism of onshore wind farms, 75 per cent of respondents considered that wind farms had a positive or neutral impact on the landscape, and this increased for respondents who were engaged in outdoor recreational activities. The Scottish Government research found that the vast majority (93 per cent) of respondents who had seen an onshore wind farm suggested that this would not have any effect on their likelihood to return to an area. In

addition, it is also noted that, as set out in *Chapter 21*, no other marine users raised concerns through scoping for the Project.

22.9 Mitigation

108 Section 22.5 details Embedded Mitigation in relation to the Project. Tables 22.14 to 22.20 below include a summary of mitigation in relation to each impact title.

109 A significant negative impact would only be experienced where the labour market was unable to provide the necessary level of skilled and semi-skilled workers in the phases of the Project. During the construction phase in the 'High' impact scenario any increased demand leading to some labour market pressures could be addressed and/or mitigated most readily through initiatives to train or re-train workers to meet the demand and the importation of skilled workers from outside the area. Negative impacts, which may occur in terms of temporary short-term pressure on the supply of labour, could be mitigated by a programme of labour pool up-skilling and business and training infrastructure improvement. Public sector agencies and authorities with the support of central government and the private sector are leading the development of national and regional initiatives as outlined in the education and training section in *Appendix 22A, Section 22.2.5*.

110 The demand from the Project for higher skilled workers including those with highly skilled offshore expertise could be relatively large based on the labour market assessment. It would be beneficial to target low skilled workers for training or re-training to meet this demand. On implementation of such skills training, and availability of the required labour force, the demand for labour would result in a positive impact.

111 Based on the outputs from this impact assessment, it has been concluded that the Embedded Mitigation detailed in *Section 22.5* is appropriate and no Additional Mitigation is proposed for the Project.

22.10 Impact Interactions

112 The potential for individual impacts identified through the impact assessment above to interact and create new, or more significant impacts on the identified receptors, has been assessed. No such interactions have been identified.

22.11 Residual Effects

22.11.1 Construction Phase

113 The following economic impacts and residual effects are assessed as being likely to occur as a result of the Project during the construction phase (Table 22.14).

Table 22.14: Construction Phase Economic Impacts and Residual Effects

Impact Title	Sensitivity of Receptor	Magnitude of Impact	Impact Significance
Construction Employment	Economic Study Area		
Base scenario	Low	Low positive	Minor positive
457 temporary jobs			
£28.4 million GVA			
High scenario	Low	Low positive	Minor positive
1,384 temporary jobs			
£86.1 million GVA			
Mitigation in Relation to Impact			
There are a number of national, regional and local initiatives involving the Scottish Government and regional and local development agencies with the aim of providing enhanced skills training, supply chain enhancement, and support for business improvement working in the offshore wind industry. These will assist in realising and maximising the opportunities in the Economic Study Area and where appropriate ICOL will support these initiatives. These initiatives would contribute to enhancing the likelihood of construction employment and output being based within the Economic Study Area.			
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Base scenario	Low	Low positive	Minor positive
High scenario	Low	Low positive	Minor positive

114 For wider impacts (Table 22.15) it is considered feasible that during the construction process there will be opportunities for those employed to develop skills that will be of benefit to the Economic Study Area in the longer term, and indeed would be transferrable to other projects. Examples might include, the development of project management and engineering skills, which could be beneficial in terms of ensuring that local companies or individuals are much better placed to compete for future construction work in the wider area, or increasing the number of new starts and supporting small businesses that can benefit from work related to the Project. Once established, these firms or individuals will be in a stronger position to survive and benefit from ongoing work elsewhere.

Table 22.15: Construction Phase Wider Economic Impacts and Residual Effects

Impact title	Sensitivity of Receptor	Magnitude of impact	Impact Significance
Wider Economic Impacts	Low	Low positive	Minor positive
Mitigation	Not applicable		
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Wider Economic Effects	Low	Low positive	Minor positive

115 For two of the four catchment areas within the Economic Study Area, significant impacts are assessed as being likely to occur during the construction phase only, these being in the labour market catchment areas around the Cromarty Firth and Dundee.

Table 22.16: Construction Phase Impact and Residual Effects (Cromarty Firth & Dundee)

Impact title	Sensitivity of receptor	Magnitude of impact	Impact Significance
Cromarty Firth	Medium		
Base scenario		Major positive	Moderate positive
High scenario		Major positive	Moderate positive
Dundee	Low		
High scenario		Moderate positive	Minor positive
Mitigation in relation to Impact			
There are a number of national, regional and local initiatives involving the Scottish Government and regional and local development agencies with the aim of providing enhanced skills training, supply chain enhancement, and support for business improvement working in the offshore wind industry. These will assist in realising and maximising the opportunities in the Economic Study Area and where appropriate ICOL will support these initiatives. These initiatives would contribute to enhancing the likelihood of construction employment and output being based within the Economic Study Area.			
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Cromarty Firth	Medium	Major positive	Moderate positive
Dundee	Low	Moderate positive	Minor positive

22.11.2 Operation & Maintenance Phase

116 The following economic impacts and residual effects are assessed as being likely to occur as a result of the Project during the O&M phase (Table 22.17).

Table 22.17: Operation & Maintenance Phase Economic Impacts and Residual Effects

Impact Title	Sensitivity of Receptor	Magnitude of Impact	Impact Significance
O&M Employment			
Base Scenario	Low	Low positive	Minor positive
117 FTE Jobs			
£7.2 million GVA			
High Scenario	Low	Low positive	Minor positive
169 FTE Jobs			
£10.5 million GVA			
Mitigation in relation to Impact			
There are a number of national, regional and local initiatives involving the Scottish Government and regional and local development agencies with the aim of providing enhanced skills training, supply chain enhancement, and support for business improvement working in the offshore wind industry. These will assist in realising and maximising the opportunities in the Economic Study Area and where appropriate ICOL will support these initiatives. These initiatives would contribute to enhancing the likelihood of construction employment and output being based within the Economic Study Area.			
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Base scenario	Low	Low positive	Minor positive
High scenario	Low	Low positive	Minor positive

117 During the O&M phase, the Project will also provide wider opportunities for the involvement of suppliers in the Economic Study Area and, more generally, Scottish suppliers in a range of activities including research and development, design, project management, engineering design, fabrication/manufacture, installation and maintenance.

118 The Project will have positive effects in terms of the development of the renewables sector in the Economic Study Area, and more generally in Scotland. Demand resulting from development of the Project would further support production and employment in Scotland, providing a boost to Scottish industry and production capacity. Strengthening Scotland's

industrial base, particularly in an industry where global demand is growing, will improve the ability of Scottish firms to compete in world markets, further boosting Scotland's economy.

119 With an increasing number of offshore wind projects under development in Scotland, the potential for long term commercial viability and growth prospects for Scottish firms will increase. Cluster benefits in the industry increase where firms are supported by final demand and intermediate demand. The net effect is to increase business and employment opportunities within both the local and regional renewable energy sector, boosting the performance of local and national economies.

Table 22.18: Operation & Maintenance Phase Wider Impacts and Residual Effects

Impact title	**Sensitivity of receptor**	**Magnitude of impact**	**Impact Significance**
Wider Economic Impacts	Low	Low positive	Minor positive
Mitigation	No mitigation proposed		
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Wider Economic Effects	Low	Low positive	Minor positive

22.11.3 Decommissioning Phase

120 Table 22.19 summarises the economic impacts and residual effects assessed as being likely to occur as a result of the Project during the decommissioning phase.

Table 22.19: Decommissioning Phase Impacts and Residual Effects

Impact Title	**Sensitivity of Receptor**	**Magnitude of Impact**	**Impact Significance**
Decommissioning Employment			
200 FTE jobs	Low	Low positive	Minor positive
£17.4 million GVA			
Mitigation in relation to Impact			
As for construction			
Residual Effects	**Sensitivity of Receptor**	**Magnitude of Impact**	**Level of Significance**
Base scenario	Low	Low positive	Minor positive

121 For wider impacts those derived from the decommissioning phase would be similar to those which would arise from the construction phase (see *Section 22.11.1*).

22.11.4 Tourism Impacts and Effects

The assessment concludes that impacts upon tourism and recreation receptors, where these occur, would only be at a negligible level (see Impact *Section 22.8.4* above) as set out in Table 22.20.

Table 22.20: Tourism Impacts and Residual Effects

Impact title	Sensitivity of receptor	Magnitude of impact	Impact Significance
Tourism and Recreation Visual Impacts	Various	Negligible	Up to Minor/moderate
Tourism Accommodation Impacts	Low	Low positive	Minor
Mitigation	Not applicable		
Residual Effects	**Sensitivity of receptor**	**Magnitude of impact**	**Level of Significance**
Tourism and Recreation Effects	Various	Negligible	Up to Minor/moderate

122 There would be no direct effects on land based tourism and recreational resources during the construction, O&M, and decommissioning phases of the offshore elements of the Project. Indirect effects would be limited to the effects on visual amenity of these resources, and are not likely to have a significant negative effect on the visiting patterns of tourist and recreational user receptors.

123 In addition, indirect effects would also be derived from the temporary demand from workers during the construction and decommissioning phases, and demand from permanent workers during the long term O&M phase of the Project. However, it is unlikely that the scale of demand and the scattered nature and extensive supply of accommodation would result in anything other than a minor impact on tourism accommodation provision.

22.12 Trans-boundary Statement

124 There would be no significant direct adverse socio-economic effects on neighbouring countries arising from the Project, given that the Project lies entirely within UK waters.

125 There is the likelihood under the 'Base' scenario (where around 10 per cent of expenditures are supplied from within Scotland and a further 13 per cent within the UK) that the majority

of equipment and services and some of the skilled workforce would derive from within other EU member states, with the location of the supply chain resulting in positive socio-economic effects within such states. However, as it is not possible to specify the location of the source of supply at this time, it is not possible to estimate the level of significance of any socio-economic effects on individual states.

126 In the 'High' scenario the majority of equipment and services would be procured from within the UK (around 33 per cent of expenditures supplied from within Scotland and a further 27 per cent within the UK) with the skilled workforce mainly deriving from the UK. In this scenario there would be only minor socio-economic effects experienced within other EU member states and further afield.

22.13 Cumulative Assessment

22.13.1 Methodology

127 GVA and job numbers have been used from the assessment for this Project and presented on an equivalent basis at a Scottish level with numbers for other proposed large scale offshore wind farm projects off the east coast of Scotland:

- Firth of Forth Phase 1 (Seagreen Wind Energy Ltd, 2012);
- Neart na Gaoithe (Mainstream Renewable Power, 2012);
- Telford, Stevenson, MacColl Wind Farms (Moray Offshore Renewables Ltd, 2012); and
- Beatrice Offshore Windfarm (Beatrice Offshore Windfarm Ltd, 2012).

22.13.2 Summary

128 Table 22.21 below sets out the potential impacts of the Project cumulatively with the above projects.

129 Source references are provided and where job numbers have been derived, the basis is noted in Table 22.21. It is assumed that each project will be developed over a broadly similar timescale and will jointly draw upon the labour market catchments as shown in this assessment.

Table 22.21: Cumulative Summary - Whole of Scotland

All Values - Total Scotland	ICOL Project	Neart na Gaoithe[1]	Firth of Forth Phase 1[2]	MORL Project[3]	Beatrice Project[4]	Total
CONSTRUCTION (CAPEX)						
GVA – Low/Base £m	154	75	80	312	320	**941**
GVA - High £m	507	518	321	802	576	**2,724**
Low/Base Case - average net jobs per annum	494	322	1,728	960	1246	**4,750**
High Case - average net jobs per annum	1,629	2,704	7,196	2500	2169	**16,198**
OPERATIONS (OPEX) per annum						
GVA – Low/Base £m p.a.	15.6	12.0	17.4	17.1	17.1	**79**
GVA - High £m p.a.	22.4	18.0	23.5	43.0	26.4	**133**
Low/Base Case - average net jobs per annum	117	100	200	244	188	**849**
High Case - average net jobs per annum	169	145	200	376	343	**1,233**
DECOMMISSIONING						
Low/Base Case - average net jobs per annum	200	275	not stated	75	363	**913**
High Case - average net jobs per annum	200	352	not stated	350	478	**1,380**
Reference Notes:		[1]NNG ES Table 23.8 and 23.10. Figure 23.12 and 23.14. Derived average over 4 year construction, 25 year operational and 3 year decommissi-oning periods.	[2]FoF Phase 1 ES Table 19.14, 19.16, 19.18, and para 19.137	[3]MORL ES Section 8.6, 11.6. Table 12.1-19 and 12.1-20. Derived average over 5 year construction, 25 year operational and 4 year decommissi-oning periods.	[4]BOWL ES Table 20.19 and 20.20, Average over each period from Plate 20.6 and 20.7.	

130 Other projects identified in *Chapter 4* (*Section 4.7.3*) as having potential for cumulative impacts have not been considered in this assessment as they have different characteristics, supply chain and employment requirements to that of the Project. Table 22.22 sets out the assessed impact of the Project cumulatively with other proposed wind farm projects off the east coast of Scotland in relation to the Economic Study Area and drive time catchments.

Table 22.22: Cumulative Impact Assessment of Construction Phase In Relation to Economic Study Area

	Leith			Rosyth			Dundee			Cromarty Firth		
Drive-time	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**
Working age population	491,563	773,429	1,165,142	590,468	1,102,710	1,701,503	185,453	348,495	482,398	21,589	73,576	93,382
Economically active (16-74 years)	295,563	467,057	694,003	356,209	657,832	995,554	105,367	200,907	277,932	13,673	47,654	60,737
Potentially available labour pool	21,942	34,871	58,808	27,512	54,539	89,386	8,183	16,026	23,762	758	2,383	2,861
Manufacturing and construction related workforce	51,931	114,459	195,891	90,416	182,329	294,607	36,004	68,759	97,671	4,841	12,820	16,077
Base scenario : Net Additional Jobs Total = 4,750												
As % of working age population	1%	1%	0%	1%	0%	0%	3%	1%	1%	22%	6%	5%
As % of economically active	2%	1%	1%	1%	1%	0%	5%	2%	2%	35%	10%	8%
As % of potentially available labour pool	22%	14%	8%	17%	9%	5%	58%	30%	20%	627%	199%	166%
Manufacturing and construction related workforce	9%	4%	2%	5%	3%	2%	13%	7%	5%	98%	37%	30%

	Leith			Rosyth			Dundee			Cromarty Firth		
Drive-time	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**	**30 min**	**45 min**	**60 min**
High scenario : Net Additional Jobs Total = 16,198												
As % of working age population	3%	2%	1%	3%	1%	1%	9%	5%	3%	75%	22%	17%
As % of economically active	5%	3%	2%	5%	2%	2%	15%	8%	6%	118%	34%	27%
As % of potentially available labour pool	74%	46%	28%	59%	30%	18%	198%	101%	68%	2137%	680%	566%
Manufacturing and construction related workforce	31%	14%	8%	18%	9%	5%	45%	24%	17%	335%	126%	101%

22.13.3 Cumulative Impact of Construction Phase

131 As stated above, Table 22.22 shows that the potential cumulative effect of the Project, and the other offshore wind farms specified in the assessment, on the four catchments that make up the Economic Study Area. Neither Leith nor Rosyth would experience anything other than a negligible or low negative impact as the level of demand for construction labour would not result in any pressure on labour market capacity in either the 'Base' or 'High' scenarios.

132 While the potentially available labour pool within the 30 minute drive-time catchment in each of Leith and Rosyth would experience some pressure, this would only be a very localised effect and the wider 45 minute and 60 minute drive-time catchments would be able to provide the necessary level of labour.

133 For Dundee under the 'Base' scenario, there would be a moderate effect upon the potentially available labour pool in the 30, 45 and 60 minute drive-time catchments of 58 per cent, 30 per cent and 20 per cent respectively. The impact upon those 'economically active' would not result in a negative effect. The overall effect would be minor positive.

134 In the 'High' scenario, Dundee would experience a high effect upon the potentially available labour pool in the 30, 45 and 60 minute drive-time catchments of 198 per cent, 101 per cent and 68 per cent respectively. The percentage impact upon those 'economically active' would result in a positive effect, with the overall effect being moderate positive.

135 For the Cromarty Firth under the 'Base' scenario, there would be a major effect upon the potentially available labour pool in the 30, 45 and 60 minute drive-time catchments of 2137 per cent, 680 per cent and 566 per cent respectively. Thus the potentially available labour pool would be unable to meet the cumulative labour force requirements if all projects were developed concurrently using facilities in this area. The percentage impact on those 'economically active' would result in a moderate effect at a 30 minute drive-time level and the overall effect would be moderate negative in this regard. However this could be addressed through skills and training initiatives and the import of such labour into the catchment area attracted by the available jobs. In these circumstances this would result in moderate positive impacts.

136 In the 'High' scenario, the Cromarty Firth would experience considerable pressure, in all drive-time catchments for the potentially available labour pool and those economically active within the population. Currently, the local labour market would be unable to meet these labour requirements, which would lead to labour shortages and 'over-heating' in the economy. Were this to occur, the result would be major negative effects for the local economy in this regard. However this could be addressed through skills and training initiatives and the import of such labour into the catchment area attracted by the available jobs. In these circumstances this would result in major positive impacts.

137 In practice not all of the offshore wind farm projects would be located at a single facility for the duration of their construction phases for a variety of market, logistical and geographic reasons. Geographic proximity to a given project, developer and manufacturer

infrastructure, along with labour force availability, would mean that the various offshore wind farm construction activities are likely to be distributed between these facilities or other more distant locations. This cumulative impact assessment therefore illustrates the 'worst-case' for negative effects or 'best-case' for positive effects upon each of the facilities.

22.13.4 Cumulative Impact of Operation and Maintenance

138 The Project would generate between 117 and 169 FTE net additional jobs, with the combined O&M employment of all the wind farms being between 849 and 1,233 FTE jobs. As this number is, at most, 25 per cent of the cumulative construction employment, it is likely there will be negligible negative effects within any catchment area within the Economic Study Area, with moderate positive effects likely to arise over the O&M period depending on what combination of projects were supplied from facilities in each catchment areas.

22.13.5 Cumulative Impact of Decommissioning Phase

139 The Project is estimated to generate 200 FTE net additional jobs during decommissioning. Whilst estimates are not available for all projects, the cumulative impact of the decommissioning of all of the wind farm projects may result in between 913 and 1380 FTE jobs over the temporary decommissioning phase. As this value is about 25 per cent of the cumulative construction employment, it is likely that there would be negligible negative effects at any of the locations within the Economic Study Area. Moderate positive effects would be likely to arise over the decommissioning period depending on what combination of projects may be supplied from facilities in each catchment area.

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