

Chapter 23 Socioeconomics

23.1 Introduction

- 1 This chapter presents a summary of the existing socioeconomic conditions in the study area. The chapter also includes a socioeconomic impact assessment of the proposed onshore and offshore development components of the Neart na Gaoithe offshore wind farm, including the export cable and onshore substation. Appendix 23.1: Socioeconomic Technical Report provides additional information in support of the assessment.
- 2 The five local authority regions of Angus, Dundee, Fife, Edinburgh and East Lothian have been chosen for socioeconomic assessment because they are most likely to be impacted by the development. However, due to the large scale investment associated with the project, the potential economic impact on the rest of Scotland is also considered.
- 3 The assessment identifies potential positive and negative socioeconomic impacts of the project on the study area and wider Scottish economies. This covers the following elements:
 - Quantitative assessment of potential employment impacts;
 - Quantitative assessment of economic value; and
 - Qualitative assessment of other impacts (e.g., social and tourism).
- 4 Neart na Gaoithe is expected to generate positive economic impacts and, given the likely total project investment, the impact on the local and national economy is considered to be beneficial. Positive effects will also arise from employment via the construction supply chain and the maintenance activities throughout the wind farm's 25 year lifetime.

23.2 Neart na Gaoithe Positive Economic Contribution

- 5 The scale of investment in offshore wind farm development and construction is significant. The ability to support the demand from this investment from the local business supply chain in the study area (i.e., businesses being able to win potential contracts) is dependent on a range of factors including the strength of that supply chain, the strength of the skills available and the wider economic development environment. Many of the contracts may be won by firms elsewhere in Scotland, in the rest of UK or internationally.
- 6 For the study area, the Gross Value Added (GVA) impact associated with the project, would generate in the range of £54 million to just over £440 million GVA over the lifetime of the project for all project phases (construction, operation and decommissioning). A median estimate of the GVA impact is £250 million GVA for the study area. This is judged to be of moderate positive significance. For the whole of Scotland (including the study area), the GVA impact is estimated to be in the range of £118 million and £570 million over the lifetime of the project and for all project phases. A median estimate of the GVA impact is £344 million.
- 7 For the study area, the project if it proceeds, would generate in the range of just under 3,000 job years¹ and 11,900 job years for all project phases. This is judged to be of moderate positive significance. For the whole of Scotland (including the study area) the range could be in the order of just over 4,200 job years and 15,000 job years.

¹ E.g., 20 full-time equivalent jobs lasting 10 years is equivalent to 200 job years.

23.3 Guidance and Legislation

- 8 No guidelines exist for offshore wind farms in relation to the assessment of socioeconomic impacts required by the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000. In the absence of such guidelines, the assessment of socioeconomic impacts draws on guidance set out by Her Majesty's Treasury in the Green Book (HM Treasury, 2003).
- 9 The concept of economic benefit as a material consideration is identified in the consolidated Scottish Planning Policy 6 (Scottish Executive, 2007), superseded by the Scottish Planning Policy (Scottish Government, 2010a) which identifies "effects on the local and national economy" as one of the criteria in deciding applications for wind farm developments. This is in accordance with the Scottish Government's objective of growing the Scottish economy and, more particularly, with the published policy statement "Securing a Renewable Future: Scotland's Renewable Energy" (Scottish Executive, 2003), which highlights the manufacturing potential of the renewables sector. Additional information on the regulations and guidance document is contained in Appendix 23.1: Socioeconomic Technical Report.
- 10 In light of the content of these policy statements, this Environmental Statement (ES) chapter considers relevant economic information associated with the project and cumulative impacts arising from the interaction with other wind farm developments, including the potential number of jobs created, and economic activity associated with the procurement, construction operation and decommissioning of the development.

23.4 Policy Drivers

- 11 The Scottish Government's Low Carbon Economic Strategy (LCES) for Scotland (Scottish Government, 2010b) highlights the following:
 - Offshore wind development could generate 28,000 direct jobs, a further 20,000 jobs in related industries and over £7bn investment in Scotland by 2020;
 - The commercial opportunities within offshore wind are seen as a major area of future work and economic recovery for Scotland. The associated opportunities for inward investment are identified by LCES as a priority for Scottish Development International (SDI);
 - The need to build on established skills and to make effective use of the existing workforce through the potential use of short flexible training modules that add to the individual's experience and qualifications e.g., skilled individuals with experience in the oil and gas sector working in offshore renewables; and
 - The importance of Low Carbon Skills Fund which includes training/qualifications support for offshore wind technician training.
- 12 The National Renewables Infrastructure Plan (N-RIP) Stage 2 (Scottish Enterprise and Highlands and Islands Enterprise, 2010) outlines support required for the development of a globally competitive offshore renewables industry based in Scotland. The emphasis is on creating clusters of economic activity throughout the supply chains around key locations in Scotland for manufacturing, installation, operation and management. It is reported that for Scotland's economy the direct economic impact of the manufacturing potential would support over 5,000 jobs and generate an annual GVA of £294.5 million.
- 13 Further details of the main policies of relevance to the project are presented in the Appendix 23.1: Socioeconomic Technical Report.

23.5 Data Sources

- 14 The socioeconomic assessment used the following research methods:
- Preparation of a socioeconomic baseline description for the study area;
 - Development of an economic impact methodology and numerical model for estimating the GVA and employment impacts; and
 - Consultation with representatives from: Angus Council; City of Edinburgh Council; Dundee City Council; East Lothian Council; Fife Council; Scottish Enterprise; and Visit Scotland.
- 15 Sources of information used to inform this chapter include:
- British Wind Energy Association (BWEA) (now Renewable UK);
 - Her Majesty’s Treasury (HM Treasury);
 - Highlands and Islands Enterprise (HIE);
 - IPA Energy and Scottish Renewables;
 - Marine Scotland;
 - Office for National Statistics (ONS);
 - Scottish Enterprise (SE);
 - Skills Development Scotland (SDS); and
 - The Scottish Government.
- 16 Full details of the methodology can be found in Appendix 23.1: Socioeconomic Technical Report which also includes:
- Annex A: References; and
 - Annex B: Inputs and assumptions used in the modelling of the economic impact assessment.

23.5.1 Data Analysis Methodology

- 17 To assess the economic impact of the project a numerical model was developed. The model was underpinned by available evidence and assumptions made on the development. Appendix 23.1: Socioeconomic Technical Report lists the key inputs and assumptions used in the model.
- 18 Inputs to the model included secondary sources (e.g., industry estimates from other research reports) and estimates of figures such as job creation and local spend by project phase and geography. These inputs are described further in Appendix 23.1: Socioeconomic Technical Report. It should be noted that estimates provided in this chapter should be considered as indicative only, as they cannot reflect the actual procurement decisions which will take place in the future. It represents the ‘best guide’ at the time of writing of the potential expenditure and levels of employment that might be provided by the project.

23.6 Engagement and Consultation

23.6.1 Strategic and Site Level Requirements

- 19 There are a number of strategic considerations which have been raised in policy documents, such as the Blue Seas – Green Energy Sectoral Marine Plan (Marine Scotland, 2011a) and accompanying documents. These issues are outlined in Table 23.1 below. The table also provides an overview of relevant comments and requirements from Marine Scotland’s Scoping Opinion. The Blue Seas – Green Energy Sectoral Marine Plan is discussed in more detail in Chapter 7: Engagement and Commitments.

23.6.2 Consultation

- 20 Consultation has been undertaken with the local authorities in the study area; Angus Council, Dundee City Council, Fife Council, City of Edinburgh Council and East Lothian Council and other appropriate organisations, including Scottish Enterprise and Visit Scotland in order to inform the assessment of the potential socioeconomic impacts of the project.
- 21 The consultation exercise included gathering views on the strength of the supply chain in the study area, initiatives supporting the development of skills in the study area, and an overview of the tourism profile in the study area.
- 22 The consultation exercise established that the study area was very well prepared to meet the opportunities that offshore wind farm developments will bring. This is reflected in strategic alliances being formed and the active grouping and showcasing of the potential capabilities of the regional supply chain (for example through organisations such as East Coast Renewables). Colleges and universities are recognising their role in terms of research and developing skills training in offshore renewables. The supply chain is engaged but awaits the procurement stages of the project to liaise directly with potential buyers.
- 23 In terms of tourism, consultees generally viewed the project as having a potentially positive impact on business tourism and no likely negative impact on leisure tourism. It was felt, however, that there was a need to avoid conflict between the development of onshore infrastructure servicing the wind farms and potential tourism assets, such as waterfront developments, historic buildings and other features of cultural or social importance (See also Table 23.13 for a summary of findings from the consultation exercise on tourism).

Source	Comment	Relevance/reference
Blue Seas – Green Energy: A Sectoral Marine Plan for Offshore Wind Energy in Scottish Territorial Waters. Part A: The Plan (comment from Marine Scotland) (Marine Scotland, 2011a)	Socioeconomic evaluation of the effects of developments will be required at the project level. Developers will be expected to establish a net benefit from their proposals overall, for the people of Scotland and the proximate communities affected by the developments.	This chapter’s impact assessment provides information on the ‘gross’ benefit of the proposal for the people of Scotland and the proximate community. This does not take into account any loss of employment or economic activity that may occur elsewhere as a result of, for example, changes in the wider electricity market or generation capacity in Scotland.
Economic Assessment of Short Term Options for Offshore Wind Energy in Scottish Territorial Waters: Costs and Benefits to other Marine Users and Interests (Marine Scotland, 2011b)	The preferred method for site level assessments of economic impact on commercial fisheries uses accurate estimates of the number of boats from local ports visiting the area in question, by gear type, and proportion of year spent there or annual income derived from the site.	Refer to Chapter 16: Commercial Fisheries.
	Further data collection and assessment of potential social impacts is needed to better inform decision making at a local level (although recommended regions in report are West and South West).	The assessment undertaken in this chapter considers social impacts.
Scoping Opinion (comment from East Lothian Council)	Potential for the creation of jobs should be considered.	The assessment undertaken in this chapter considers creation of jobs.
Scoping Opinion (comment from Fife Council)	The impact on Rosyth and European routes should be considered as it is strategic consideration for Scotland and Fife.	The ferry from Rosyth is no longer a passenger ferry. The assessment undertaken in this chapter considers impacts on European ferry routes. Also see Chapter 17: Shipping and Navigation.

Table 23.1: Strategic and site level commitments and requirements

23.7 Impact Assessment Methodology

- 24 This section describes the assessment methodology used to estimate the potential economic impacts associated with the project on the economies of the study area.
- 25 As discussed above, in view of the lack of statutory or advisory guidance on preparing socioeconomic impact assessments for wind farms, the methodology used for the socioeconomic impact assessment uses good practice guidance for assessing economic impact published in the Green Book (HM Treasury, 2003) and in the Economic Appraisal Guidance Note (Scottish Enterprise, 2008).

23.7.1 Study Area

- 26 The geographic focus of the socioeconomic impact is the five local authority regions which are most likely to be directly and/or indirectly affected by the project: Angus, Dundee, Fife, City of Edinburgh and East Lothian.
- 27 This covers the expenditure and employment associated with the offshore development (i.e., offshore site and cable route) and the onshore study area (onshore cable route and substation).
- 28 These local authority regions represent the 'study area' (Figure 23.1). Assessing impact beyond these areas is likely to be associated with weaker evidence of onshore impact of the offshore activities (primarily because of the distance from the Firth of Forth). The potential economic impact on the rest of Scotland is also considered.

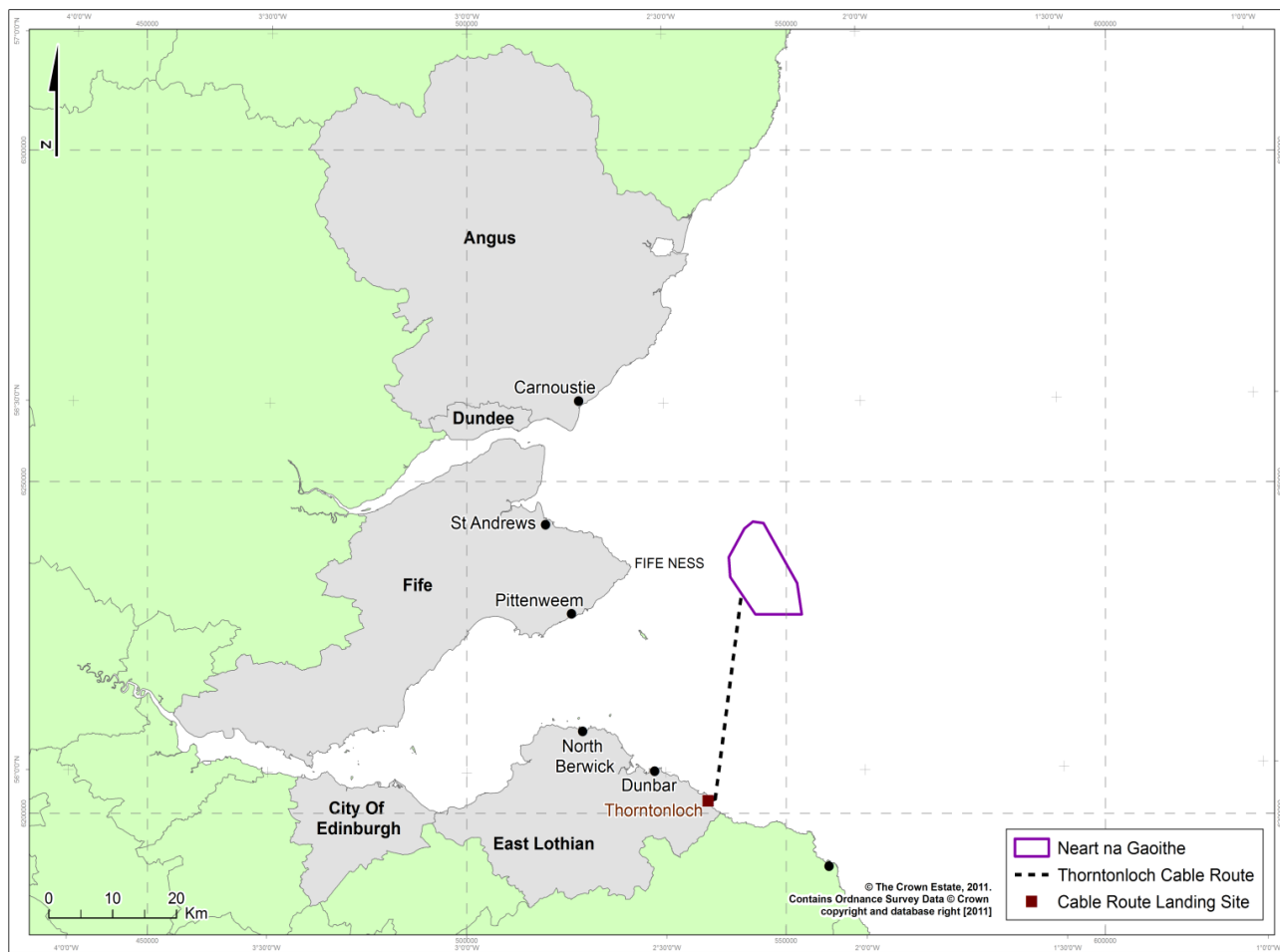


Figure 23.1: The study area

23.7.2 The Rochdale Envelope

- 29 For the purposes of the assessment (for the whole project), the following phases (and corresponding sub-phases) are included: consenting and development, manufacture, construction/installation, operation and maintenance and decommissioning. Indicative estimates for project expenditure were provided by project sub-phase and study area. The project phases are based on those identified in the Scottish Renewables report (IPA Energy, 2010) and project specific information. The phases are presented in Table 23.2.
- 30 The project timeline used for the assessment is from 2008 to 2039 (32 years in total) i.e., from the consenting phase through to the first decommissioning phase after approximately 25 years. Assessing socioeconomic impacts ahead of 25 years into the future would be highly subjective and any conclusions would be highly speculative due to the uncertainties associated with a longer timescale. The project timeline is based on the following assumptions on the duration of each phase detailed in Table 23.2.

Phase	Aspect	Sub-phase	Duration
Construction (for the reporting of economic impacts, construction includes the following phases: consenting and development; manufacture; and construction/ installation)	Consenting and development	● Consenting and development (onshore and offshore).	2008 to 2012 (5 years)
	Manufacture	● Technical and commercial management (onshore and offshore); ● Supply: Turbines, transformers & towers and Supervisory Control and Data Acquisition (SCADA) (offshore); ● Supply: Foundations (offshore); ● Supply: Cables (inter-array and export); and ● Supply: Substations (onshore and offshore).	2013 to 2015 (3 years)
	Construction/ installation	● Installation: Foundations, Met mast and turbines (onshore and offshore); and ● Installation: Cable lay (inter-array and export), testing and commissioning (onshore and offshore).	2014-2015 (2 years)
Operation and Maintenance	Operation and maintenance	● Operation and maintenance (onshore and offshore); and ● Other costs (onshore and offshore).	2015 to 2036 (22 years)
Decommissioning	Decommissioning	● Decommissioning (onshore and offshore).	2037 to 2039 (3 years)

Table 23.2: Phase and sub-phase of development

- 31 This breakdown by sub-phases (refer to Table 23.2) was applied to the expenditure by geography to provide expenditure per annum values for the study area, the rest of Scotland and elsewhere. The expenditure was used to estimate the effect of the project in terms of GVA and employment.
- 32 GVA is a key measure of the economic performance of a region. GVA is the difference between the value of inputs used in the production of goods and services and the value of the output that is created. It is mainly made up of employees' wages and company profits and can be defined as;

"the amount that individual businesses, industries or sectors contribute to the economy. Broadly, this is measured by the income generated by the business, industry or sector less their intermediate consumption of goods and services used up in order to produce their output. GVA consists of labour costs (e.g., wages and salaries) and an operating surplus (or loss)" (Scottish Government, 2012).

23.7.3 The Approach to Impact Assessment

- 33 This section sets out the assessment methodology used to estimate the potential economic impacts associated with the project on the economies of the study area and the rest of Scotland.
- 34 Where possible, the overarching Environmental Impact Assessment (EIA) methodology for assessing the potential magnitude of effects and vulnerability of receptors has been applied. However, due to the inherent nature of assessing employment and GVA, the criteria for assessing the overall significance of environmental impact does not readily fit in the context of economics. For the purposes of the assessment, the terminology relating to magnitude of effect and vulnerability of receptor is used but its interpretation departs from the general context applied elsewhere in this ES. This deviation from the high level definitions and approach is discussed in more detail below.
- 35 The assessment of potential employment impacts that would be associated with, or supported by, the project does not take into account any loss of employment or economic activity that may occur elsewhere as a result of, for example, changes in the electricity market or generation capacity in Scotland. Within the scope of this assessment, it is not possible to determine whether the electricity produced will be replacing other sources (in Scotland or the rest of the UK) and what these other sources might have been.
- 36 Appendix 23.1: Socioeconomic Technical Report provides more detail on the baseline conditions, assessment approach and ultimate conclusions and should be read in conjunction with the chapter.

23.7.3.1 GVA Assessment Methodology

- 37 In order to assess the potential GVA (and employment) arising as a result of the project, two scenarios have been used: a 'low case' and a 'high case':
- A 'low case' scenario was developed whereby the percentage of expenditure by project sub-phase and geography was described. This low case **refers to the total value of contracts that have been delivered, or are expected to be delivered, from within each geography², assuming the current supply chain.** This represents a conservative estimate of the supply chain.
 - A more optimistic 'high case' scenario was created using the same process as described for the low case to reflect the uncertainties involved and long duration of project works. The high case scenario **refers to the total value of contracts that could be secured with a stronger supply chain.** This assumes that some Scottish-based firms not currently in a position to tender for work (but there is good reason to expect them to be in the future) could secure contracts.
- 38 The economic impact processes that are assessed and estimated in this chapter can be sub-divided into three distinct but related effects, as described in Table 23.3:

Impact	Definition
Direct	The direct effect results from increases in economic output and/or employment generated by the developer/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 as a result of contracts obtained;
Indirect	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 cascading along their supply chains – the resulting increase in economic output and employment is termed the indirect effect; and
Induced	As a result of the direct and indirect effects, an injection of additional expenditure will be provided that will re-circulate throughout the economy: for example, workers will spend their additional incomes on a range of goods and services, and a proportion of this spending will then be re-spent in turn by other businesses (and their workers) and thus there will be a "ripple effect" throughout the economy as a whole. The resulting additional increase in demand for economic output and employment is termed the induced effect.

Table 23.3: Definitions of impact

² i.e., expenditure in study areas; rest of Scotland; rest of the UK; and elsewhere.

Direct GVA Impact

- 39 The direct GVA for the development of the project was modelled by taking the following steps (for both the low case and high case scenarios):
- Estimation of the project expenditure by phase (refer to Table 23.2) and geography (i.e., between the study area, the rest of Scotland, rest of the UK and elsewhere) according to projected distribution (refer to Appendix 23.1: Socioeconomic Technical Report for additional information); and
 - Distribution of these values equally across the relevant years for each project phase (refer to Table 23.2) according to projected distribution.
- 40 Discount rates were applied in line with Green Book guidance (HM Treasury, 2003) to provide present values of the gross GVA impact in each year. These annualised estimates were then totalled together to give the present value of estimated gross GVA to the study area and the rest of Scotland of the project.
- 41 In order to estimate the direct GVA associated with each sub-phase (refer to Table 23.2), a ratio of expenditure to GVA has been applied to the relevant expenditure values. To do this, the sub-phases have been mapped against standard industrial classification (SIC) codes which are used in statistical publications to categorise different sectors of the economy. The supply chain activities associated with each sub-phase of the project have been mapped against corresponding SICs which in turn have been mapped against Scottish Government Input-Output tables.
- 42 These estimates have been used to calculate expenditure to GVA ratios (project expenditure is equivalent to turnover for the project's suppliers). The latest input-output tables were published in 2010 but are based on 2007 data. These figures have been adjusted using the HM Treasury Gross Domestic Product (GDP) deflator. The figures used in the assessment are detailed in Appendix 23.1: Socioeconomic Technical Report.
- 43 The appropriate turnover to GVA ratios were applied to the expenditure estimates for each sub-phase in each year and geography. It is assumed that the expenditure to GVA ratios remain constant across the study area and the rest of Scotland. This provides estimates of the gross direct GVA in each year for both the study area and the rest of Scotland.
- #### Indirect and Induced GVA Impact
- 44 The indirect GVA effect is the incremental increase in the value of economic output brought about by the additional business activity among businesses supplying goods and services to support the development and operation of the project.
- 45 Induced GVA measures additional economic output from the re-circulation of direct and indirect expenditure from business procurement and workers' incomes (that is, the ripple effects throughout the economy that result from the workings of the direct and indirect effects).
- 46 These impacts are measured using standard assumptions (multipliers) based on a Scottish Government model of the Scottish economy (Scottish Government, 2010c). The value of the multiplier provides an estimate of the direct, indirect and induced effects in combination.
- 47 For Scotland, the Scottish Input-Output Tables have been used to identify GVA multipliers for each of the individual project sub-phases. The study area multipliers are estimated by reducing the Scottish multiplier values to reflect the relative smaller geographical area and more limited supply chain links associated with the study area. The following adjustments have been made to the national figures to provide multipliers for the study area:
- 50% of the indirect effect; and
 - 80% of the induced effect.
- 48 The GVA multipliers take into consideration the expenditure in the supply chain relating to the study area economies.
- 49 A complete list of the GVA multipliers used in the assessment is shown in Appendix 23.1: Socioeconomic Technical Report. These multipliers have been applied to the direct GVA estimates for each sub-phase and geography to provide an estimate of the total (direct, indirect and induced) GVA impacts associated with Neart na Gaoithe.

Present Value of GVA Impacts

- 50 To make a comparison of the direct and indirect GVA that occurs in different years, discount rates are applied in line with Green Book guidance (HM Treasury, 2003). The discount rate is used to reflect the principle of 'social time preference', which reflects society's preference to receive goods and services sooner rather than later, and to defer costs to future generations. In line with HM Treasury guidelines, a discount rate of 3.5% is used for the first 30 years and a rate of 3.0% is used for each subsequent year for the expected lifetime of the project.
- 51 Applying these discount rates allows for the calculation of the present value of the direct and indirect GVA associated with the project.

23.7.3.2 Economy and Labour Market Assessment Methodology

- 52 The impact of increased jobs is modelled through the following approach:
- Employment multiplier values from the Scottish Input-Output Tables, which best fit the types of goods and services to be purchased, are applied to the expenditure in each year and by geography (i.e., study area and rest of Scotland) and for each sub-phase of the project. The only exception to this is the operations and maintenance phase, as this is likely to require high levels of capital use (see below for how these estimates are derived);
 - GVA per employee figures for each industry group used is based on Scottish Government Input-Output Tables (Scottish Government, 2010c). These figures have been adjusted using the HM Treasury GDP deflator (HM Treasury, 2011);
 - The GVA in each phase and year (for both the study area and the rest of Scotland) and the GVA per employee figure were used to arrive at an estimate for employment in each phase and year (for both the study area and the rest of Scotland). The indirect and induced employment is estimated using Scottish Input-Output Tables and adjusted for the study area estimates, as described above (the multipliers are presented in Appendix 23.1: Socioeconomic Technical Report).

Operations and Maintenance

- 53 With regards to the operations and maintenance employment, a report for Vestas Offshore (Oxford Economics, 2010) provides estimates of direct and indirect operations and maintenance employment per installed megawatt (MW) of offshore generation. Although it is recognised that there may be economies of scale associated with the project given its larger scale than other offshore wind farms currently operating in UK waters, this report provides evidence of the scale of operations and maintenance employment. The employment per MW values used in this assessment are as follows (Oxford Economics, 2010):
- 0.19 direct jobs per MW;
 - 0.16 indirect jobs per MW (calculation based on figures provided in Vestas Offshore report³ (Oxford Economics, 2010)).

Offshore Installation

- 54 The proportion of expenditure associated with offshore work requires hire or ownership of specialist vessels. For this reason, the ratio of turnover and GVA to employment is likely to be greater relative to many other phases of the work. To address this, the assessment used more detailed employment to GVA figures published by ONS at four digit Standard Industrial Classification level (ONS, 2010a). The classification used is 'sea and coastal water transport'. This includes vessel services for cable laying and heavy lifting.

23.7.3.3 Tourism Impact Assessment Methodology

- 55 The assessment of impacts on tourism is qualitative, and is based on the following:
- A review of existing literature showing how other wind farm developments have impacted on tourism in other areas; and
 - Feedback from consultees.

³ 1,660 jobs plus 1,570 jobs = 3,230. 3,230/ 20,500 = 0.16 indirect jobs per MW.

- 56 Impacts on landscape and visual amenity are addressed in Chapter 21: Seascape, Landscape and Visual Impacts, and impacts on recreational marine and coastal users are addressed in Chapter 22: Other Users.

23.7.3.4 Cumulative and In-Combination Impact Assessment Approach

- 57 Due to sensitivity of the economic data associated with other wind farms and the uncertainty associated with the geographical study area, the Rochdale Envelope approach has not been used.
- 58 The assessment of cumulative impacts was made against the existing baseline conditions (refer to Section 23.8) and applied the same criteria to determine significance based on the vulnerability of the receptor and the magnitude of the potential change as for Neart na Gaoithe in isolation, which was presented in Section 23.7.
- 59 In-combination impacts (those arising from an interaction between Neart na Gaoithe and other, non-wind farm projects) are assessed in the same way as are cumulative impacts: through a subjective assessment of the likely available capacity of the local supply chain and resource base, and the scale of demand that might accrue from major projects such as oil and gas and/or major port/harbour development projects.

23.8 Baseline Description

- 60 The baseline section summarises the current socioeconomic environment in the study area and provides information on relevant strategic policies and plans. Additional information is available in Appendix 23.1: Socioeconomic Technical Report.

23.8.1 Population and Demographics

- 61 The total population of the study area is slightly over one million (ONS, 2011b), representing approximately one fifth of the total population of Scotland. Of this, the greatest number live in Edinburgh, followed by Fife, Dundee, Angus and East Lothian, as shown in Table 23.4 below.

Area	Population	% of Scotland
Angus	110,300	2%
Dundee	143,400	3%
Fife	363,500	7%
Edinburgh	477,700	9%
East Lothian	96,800	2%
Study area	1,191,600	23%
Scotland	5,194,000	100%

Table 23.4: Population estimates for the Study Area and Scotland, 2009 (ONS, 2011b)

- 62 Compared to Scotland as a whole, each of the local authority regions has a broadly similar pattern in terms of the proportion of children, working age and pension age residents, as shown in Figure 23.2 below (ONS, 2011b). However, East Lothian, Angus and Fife have a lower proportion of working age population compared to Scotland as a whole (ONS, 2011e).

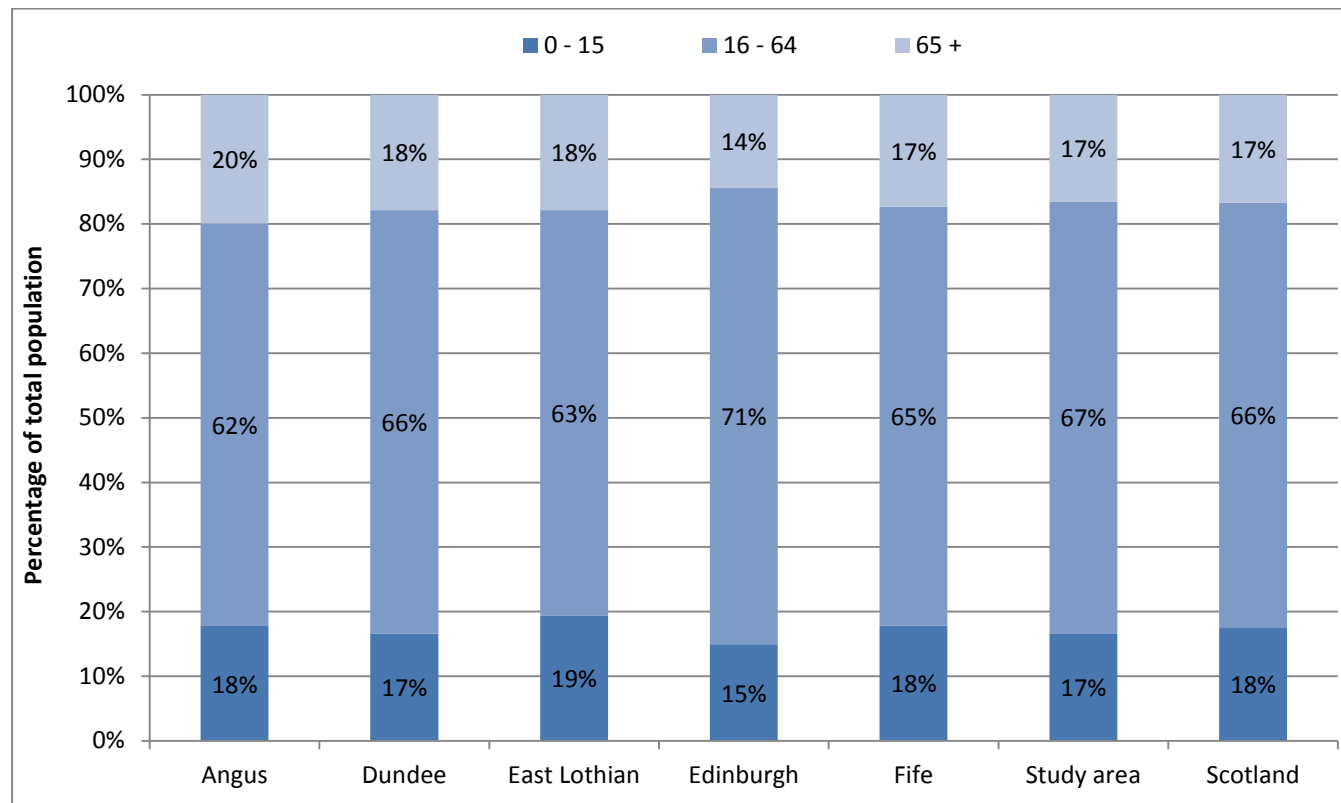


Figure 23.2: Population breakdown, 2009. Source: Mid-year population estimates (ONS, 2011b)

63 The dependency ratio is a measure of the balance between the working age population and the rest of the population. A dependency ratio of one means that for every working age resident there is an equal number of children and people of retirement age. A lower dependency ratio means a greater relative working age population. The average dependency ratio for the study area was slightly lower than the Scottish national average (Figure 23.3), due to the much lower dependency ratio in Edinburgh; the city is a major source of employment and therefore has a larger working age population. East Lothian and Angus had particularly high dependency ratios of 0.59 and 0.61, respectively, due to a lower proportion of working age residents.

64 In terms of population change, Figure 23.4 shows the actual and projected population change for each local authority and Scotland as a whole between 1981 and 2033. Whilst Scotland’s population has remained broadly static between 1981 and 2009, there were dramatic changes within the local authority regions of interest; the population of Dundee decreased by 15% whilst increases occurred in Angus (5%), Fife (6%), Edinburgh (7%) and East Lothian (20%). According to the General Registrar of Scotland’s (GROS) latest population projections, these trends are predicted to continue. For example, the population of Dundee is estimated to reduce to approximately 135,000 by 2030 and East Lothian’s is forecast to increase to almost 125,000 in the same time period.

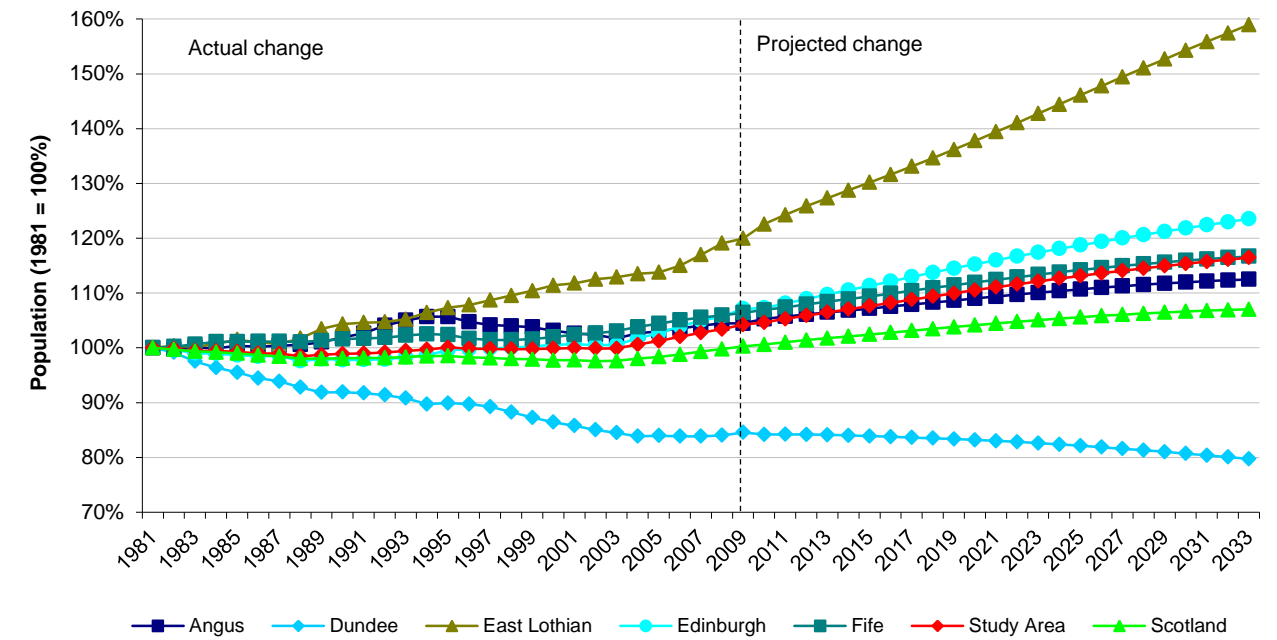


Figure 23.3: Dependency ratio, 2009. Source: Mid-year population estimates (ONS, 2011b)

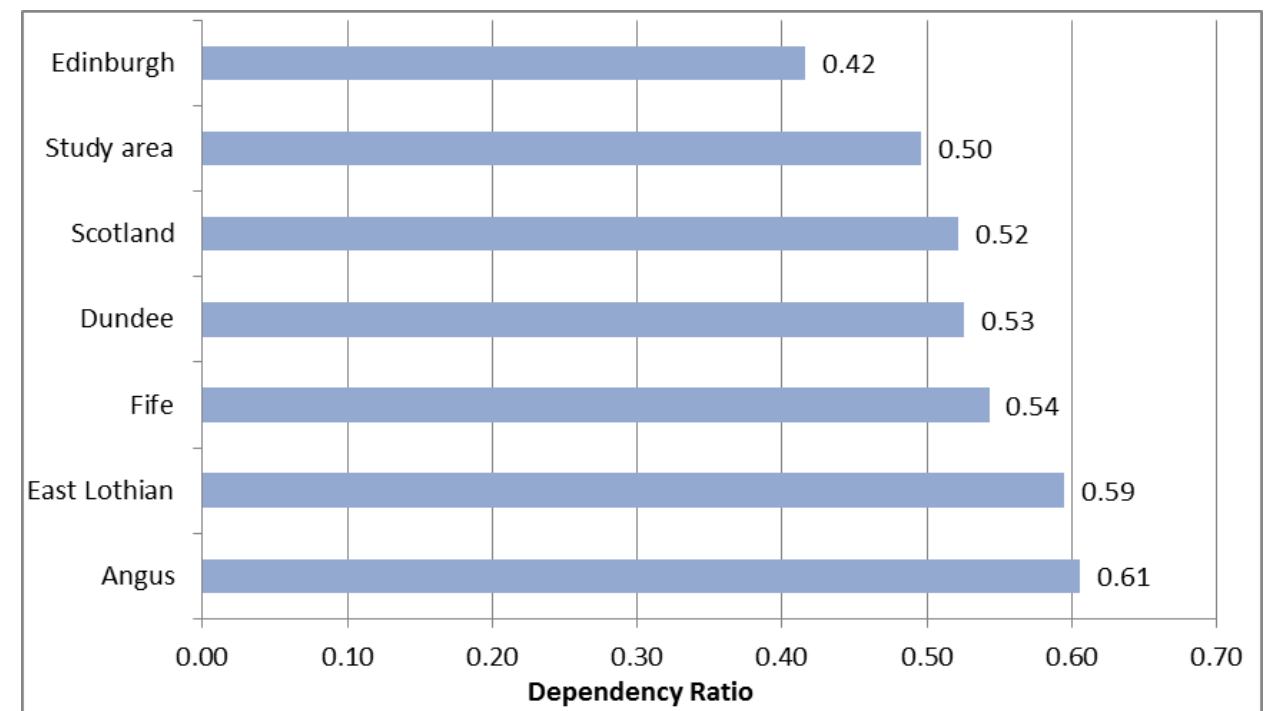


Figure 23.4: Actual and projected population change, 1981 - 2033 ONS, 2011b

23.8.2 Industrial Structure and Employment

23.8.2.1 Productivity and GVA

65 Productivity, as measured by GVA, varies widely across the study area. Edinburgh's GVA per head was £34,562 in 2008 while the GVA per head in the other local authority regions in the study area was below the Scottish average of £20,031. The study area generated £29.3 billion in 2008, approximately 30% of Scotland's total GVA. The GVA per head for the study area was broadly in line with the Scottish average of £20,308. The breakdown of GVA contribution made by different sectors indicates wide variations across the study area compared to Scotland. For example, in Angus, Dundee and Fife, production (manufacturing) industries generate a greater proportion of the GVA (19% and 24%) than in Scotland (17%), while the construction sector is larger in East Lothian (12%) than Scotland (7%). Edinburgh's business and financial services sector accounts for almost half (49%) of the city's GVA compared to 28% in Scotland as a whole. The lower GVA per head values in Dundee, Fife and East Lothian compared to the rest of Scotland and Edinburgh in particular reflect the sectoral make up of these regions. Sectors such as primary production and manufacturing are more important to Dundee, Fife and East Lothian than Edinburgh but tend to yield lower GVA per head than the key sectors in Edinburgh, such as business services and finance, which have a high GVA per head value.

Key Industry Sectors

66 Much of the variation in total GVA between the different local authorities within the study area and the rest of Scotland is reflected in the structure of employment.

67 Primary and manufacturing sectors account for a total of 12% of employment in the study area compared to a Scottish average of 18%. Figure 23.5 illustrates the breakdown of employment in the study area and in Scotland. Professional services account for a higher than average percentage of all employees in Edinburgh but lower than average in the other four local authorities within the study area. Agriculture, forestry and fishing constitute a very small percentage of Scottish employment. Details on commercial fisheries relevant to the study area are presented in Chapter 16: Commercial Fisheries.

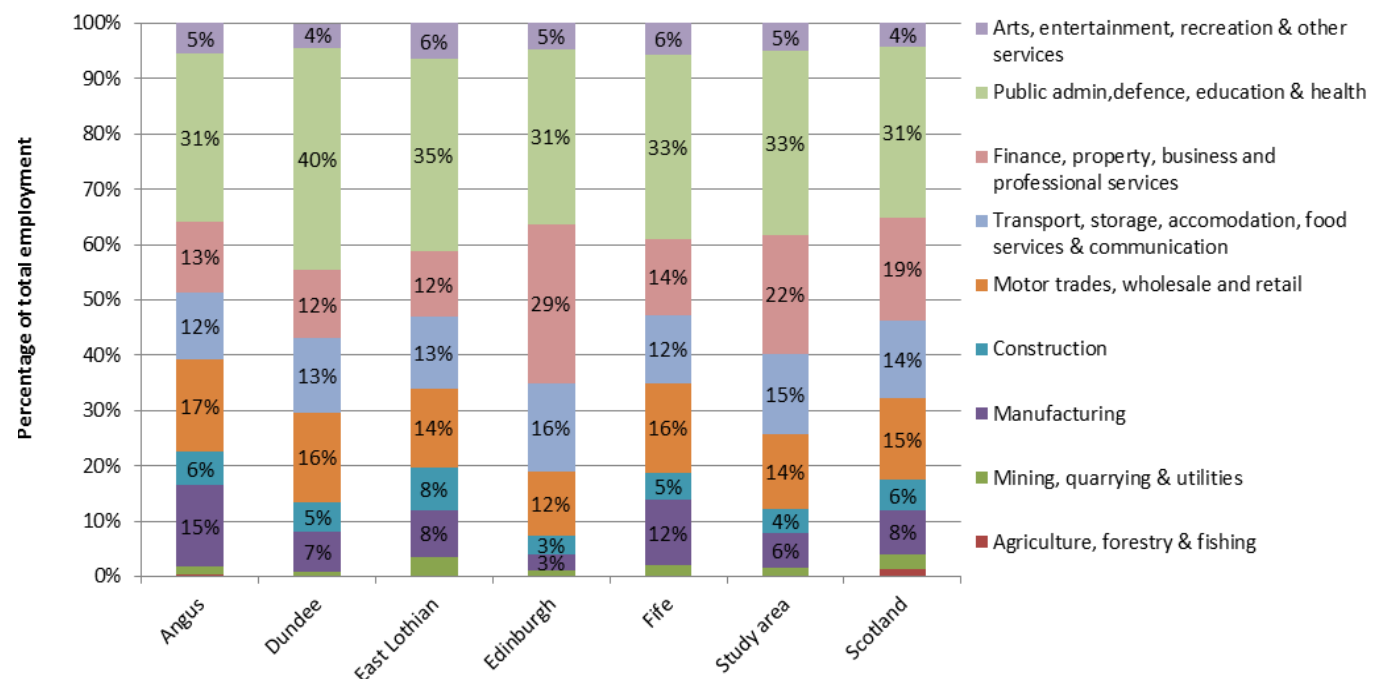


Figure 23.5: Breakdown of employment by industry sector, 2009 ONS, 2011d

68 For the study area as a whole, three important aspects of the labour market are shown in Figure 23.6 below⁴:

- The comparative importance of each sector in terms of employment relative to Scotland (as measured by the horizontal axis);
- The percentage change in employment in each sector between 1998 and 2008 (as measured by the vertical axis); and
- The relative size of employment in each sector compared to other sectors (the size of the bubble).

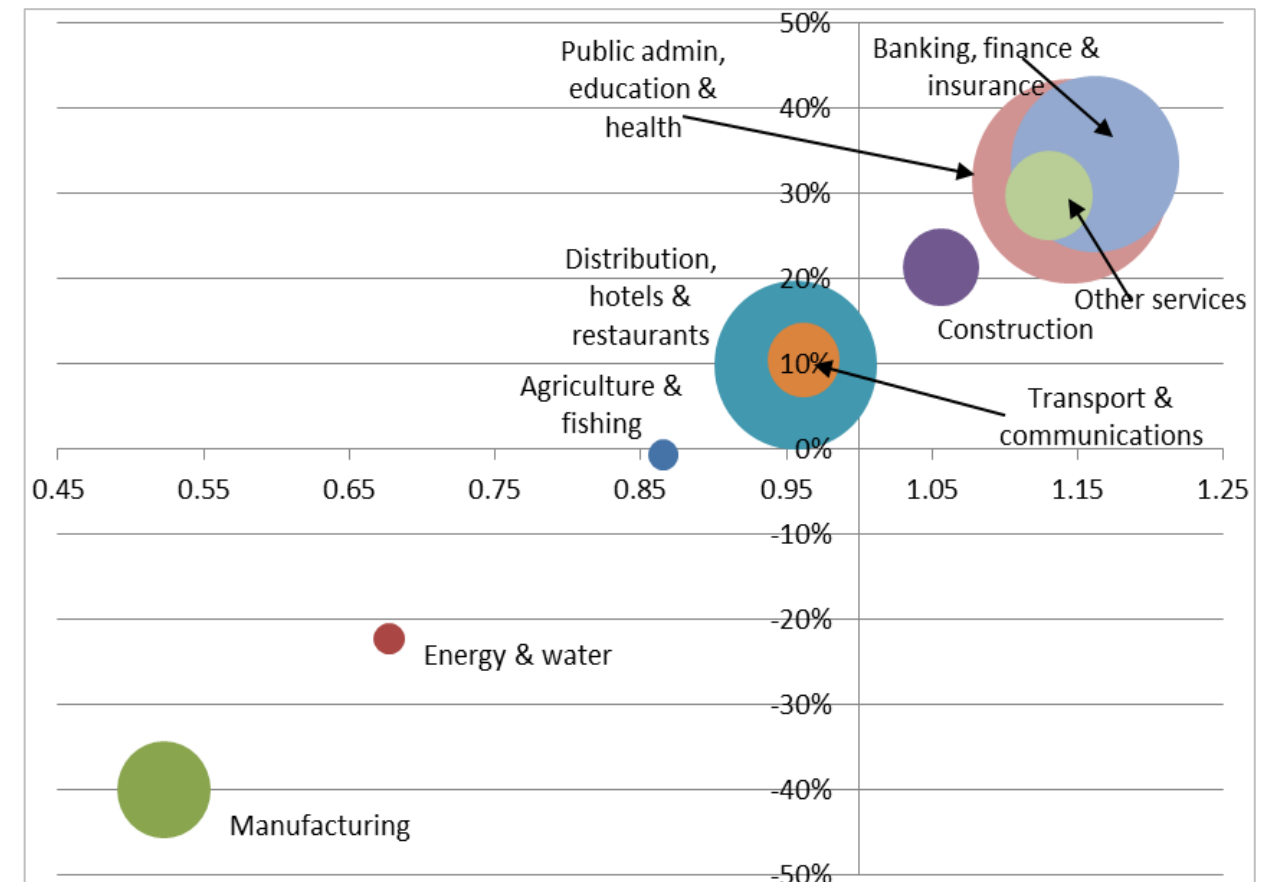


Figure 23.6: Structure and employment change within the study area, 1998-2008 (ONS, 2011e)

69 A location quotient (LQ) shows how represented a sector is within a local economy relative to the national economy. A LQ equal to 1 indicates that representation locally is equal to representation nationally. Therefore, the sectors with a score of greater or lesser than 1 are over or under-represented in the local economy, respectively. The horizontal axis in Figure 23.7 provides LQ scores for nine broad industrial groups in the study area.

70 Sectors which are over-represented within the study area include banking, finance and insurance, the public sector, construction and other services (all shown as having a LQ value greater than 1). These sectors are relatively more important in terms of employment for the study area than Scotland as a whole. Those that are under-represented include distribution, hotels and restaurants (proxy for tourism), transport and communications, agriculture and fishing, energy and water and manufacturing. Manufacturing is particularly under-represented, with a LQ of just over 0.5: this means that manufacturing is around half as important to employment in the study area as it is to employment nationally.

⁴ Note: (1) Figure 23.6 represents change in employment by sector over time (1998-2008) whilst Figure 23.5 represents a snapshot of employment in one year; and (2). The sector definitions in Figure 23.5 and Figure 23.6 are different because the ONS broad definitions for sectors changed with the release of

2009 data. The 2008 broad sector definitions are narrower than those available in 2009. The 2008 employment data have been used in Figure 23.6 as the aim is to capture employment change over a long period of time (i.e., 1998-2008). The 1998 employment data are used because the sectors can be directly compared with 2008.

71 While the majority of sectors have seen growth in employment within the study area during the period 1998 and 2008 (e.g., distribution, hotels and restaurants), a number have not. Agriculture and fishing employment levels have remained static while employment in the energy and water and manufacturing sectors has fallen by around 20% and 40%, respectively.

Business Births and Deaths

72 ONS data on the number of new start-ups and closures can be used as a proxy of the level of dynamism and entrepreneurial activity within an economy. The ONS defines a business birth as “a business that was present in year t, but did not exist in year t-1 or t-2” and defines a business death as “a business that was on the active file in year t, but was no longer present in the active file in t+1 and t+2.” The difference between the number of births and deaths gives an idea of the ‘churn’ of businesses within an economy. This churn of enterprises is important as it suggests that firms may be replaced by more competitive businesses.

73 Figure 23.7 shows the net number (i.e., births less deaths) of new businesses that have been created in the study area and Scotland. Comparing 2009 to 2004, a net additional 3,000 businesses have been created within the study area, compared to 14,000 across Scotland as a whole.

74 Within the study area, the net change in the business base between 2004 and 2009 was much lower in Dundee (+215 businesses) than the other local authority areas of East Lothian (+230), Angus (+440) Fife (+755), and Edinburgh (+1,360). This suggests that the business base in Dundee is less dynamic than the rest of the study area.

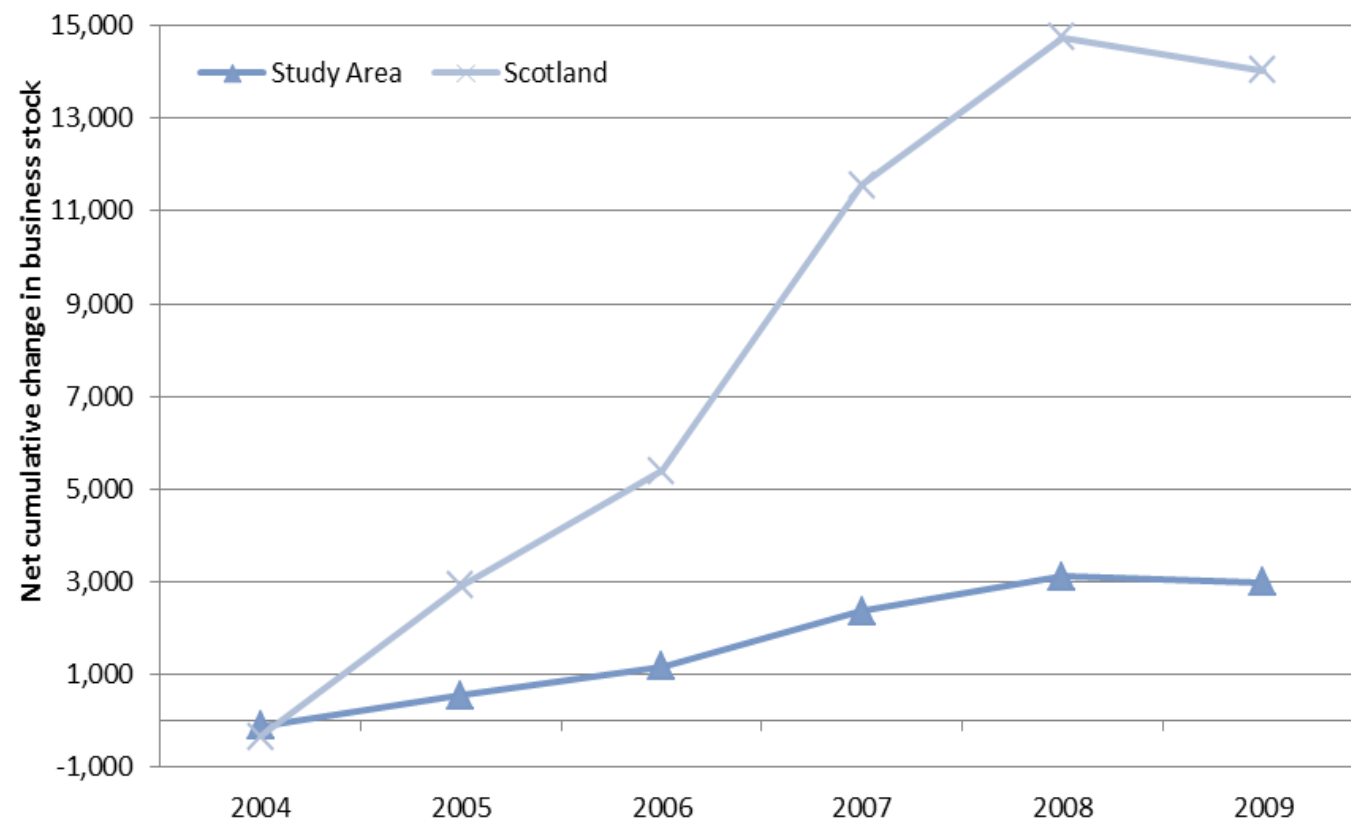


Figure 23.7: Net change in business stock, 2004-2009 (ONS, 2011f)

Employment

75 The proportion of the working age population in employment across the study area was similar to the Scottish average, 71% for the year October 2009 to September 2010 (refer to Appendix 23.1: Socioeconomic Technical Report). Within the study area, there were some differences. Dundee has tended to have a lower level of employment compared to the other three local authority areas. Edinburgh saw a large fall in the proportion of the population in employment between 2008/09 and 2009/10.

76 Unemployment, as measured by the proportion of working age people claiming Job Seekers’ Allowance (JSA), is shown in Figure 23.8. Since 2008 there has been a steady increase in the number of people claiming JSA within the study area, mirroring the national trend. Dundee, and to a lesser extent Fife, has tended to experience greater levels of unemployment than Scotland as a whole, whilst Edinburgh and East Lothian in particular have seen a lower level of unemployment.

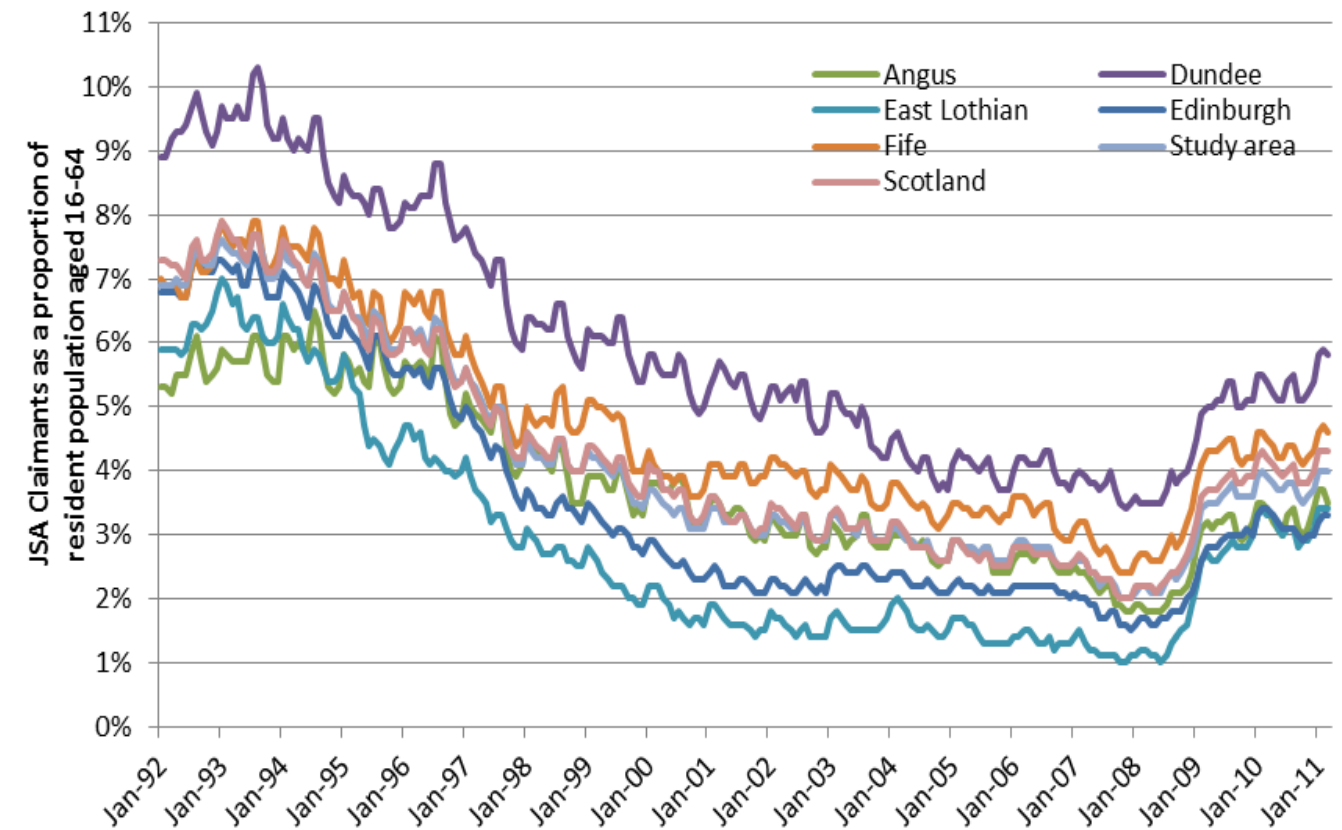


Figure 23.8: JSA claimant rate as a percentage of working age population, January 1992 to March 2011 (ONS, 2011c)

Education and Skills

77 Figure 23.9 provides a breakdown of the working age population for each local authority within the study area as well as Scotland by qualification level. The study area has a similar qualification profile to Scotland. However, only 10% of the working age population of the study area has no qualifications compared to 13% in Scotland as a whole. This is mainly driven by the low percentage of people in Edinburgh with no qualifications. Dundee for instance has a higher proportion of working age population with no qualifications compared to Scotland as a whole. The other key difference between the study area and Scotland is the higher percentage of people with NVQ level 4 or above in the study area (38%) compared to Scotland (34%). This difference is attributed to the relatively high proportion of Edinburgh’s working age population that is educated to graduate level or above.

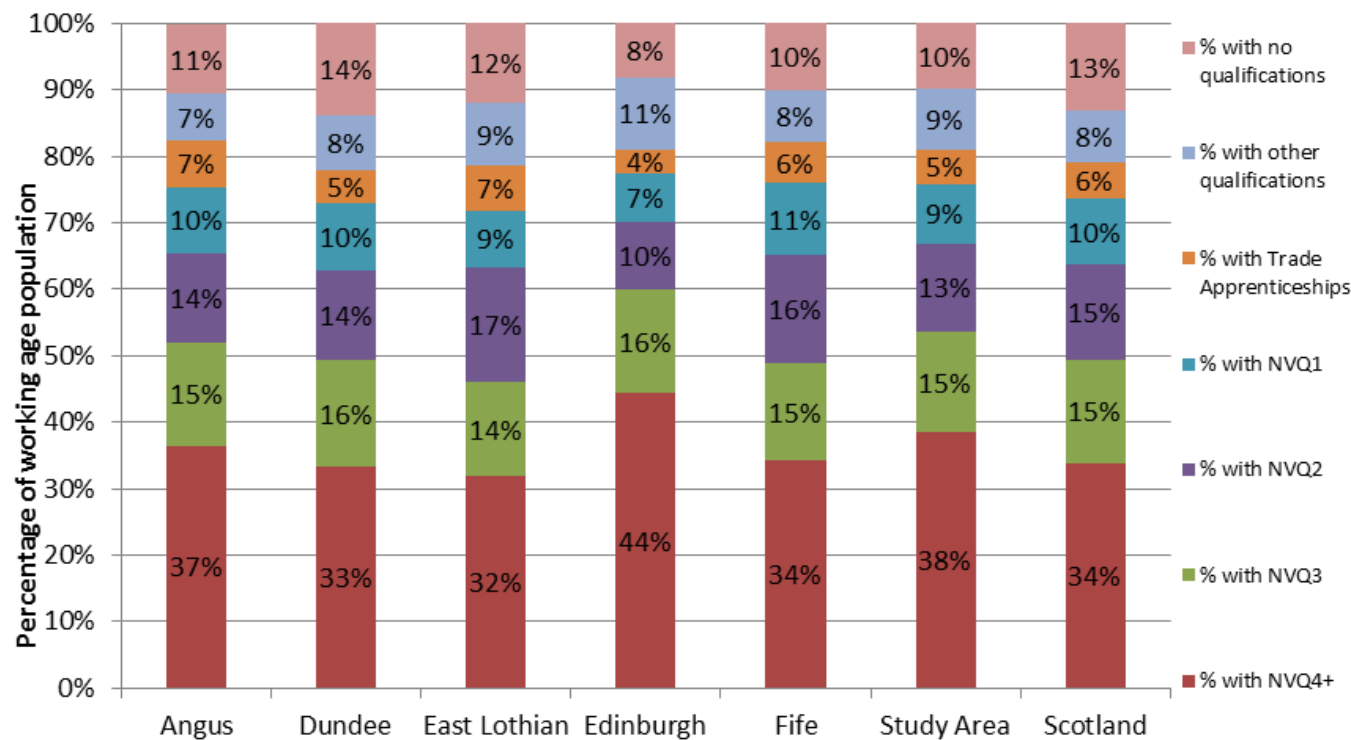


Figure 23.9: Working age population broken down by level of qualifications, 2009 (ONS, 2011a)

23.8.3 Transport and Infrastructure

78 The study area is home to six main port facilities (Leith, Dundee, Methil, Rosyth, Burntisland and Kirkcaldy) owned by Forth Ports, and two airports (Edinburgh and Dundee). The National Renewable Infrastructure Plan (N-RIP) Stage 2 (Scottish Enterprise and Highlands and Islands Enterprise, 2010) identifies port locations for potential offshore wind manufacturing which fall into three broad geographic clusters, of which 'Forth/Tay' is identified as one. In addition to manufacturing, this cluster is also highlighted as having potential for installation uses and operations and maintenance.

79 Within the Forth/Tay cluster, the following ports are identified as key assets in supporting the development of offshore wind farms: Leith, Dundee and Methil. The following is highlighted in relation to these ports:

- Leith – the site can support large scale manufacturing, installation activities and operations and maintenance. Gamesa has announced the Port of Leith as the site for its new UK plant for the manufacture of wind turbines. The investment in the Port of Leith is expected to be €150 million, creating 800 jobs (Scottish Government, 2012);
- Dundee – Scottish Enterprise has confirmed Dundee as a key location for offshore wind manufacturing; and
- Methil – Burntisland Fabrications (BiFab) operates from both the Fife Energy Park in Methil and also from bases in Burntisland and Arnish and is a major player in the manufacture of jackets for offshore wind turbines. In January 2012, Samsung Heavy Industries announced a £100 million investment in an offshore wind manufacturing facility at Methil in Fife, expected to create 500 new jobs.

23.8.4 Quality of Life

80 Although assessing quality of life can be considered a subjective exercise, there are a number of measures which can be used as a proxy. One key source is the Scottish Index of Multiple Deprivation (SIMD) (Scottish Government, 2009). The SIMD is the Scottish Government's official tool for identifying small area concentrations of multiple deprivation across Scotland.

81 The ONS publishes data on earnings using two different measures: workplace based and resident based. The values for resident and workplace based earnings differ because of commuting patterns. For example, East Lothian's resident based median earnings are higher than the workplace based earnings because many people commute into Edinburgh for work from their residences in East Lothian. The same pattern occurs for Fife.

82 Residence based earnings in Edinburgh and East Lothian are higher than the Scottish average, but were lower than average in Dundee and Angus (ONS, 2010b). Workplace earnings in all of the local authority areas except Edinburgh are lower than the Scottish average (ONS, 2010c).

83 Within the study area, Dundee suffers from a high level of deprivation with 22% of the city's 179 data zones among the worst 10% nationally (Scottish Government, 2009). In contrast, Angus, Fife, East Lothian and Edinburgh have a much lower share of Scotland's most deprived data zones: 8% of Edinburgh's data zones and 6% of Fife's are among the worst 10% nationally (Scottish Government, 2009).

84 Residential property transactions are recorded by Registers of Scotland. The median house price in the study area was £138,400 in 2009. Median house prices in Angus (£127,000), Dundee (£115,000) and Angus (£120,000) were less than the Scottish average of £134,000 at the time. Edinburgh (£170,000) and East Lothian (£160,000) were significantly above the national average.

23.8.5 Tourism

85 Tourism is a vital component of the Scottish economy. The sector generates in the region of £4.4 billion GVA and employs over 200,000 people in approximately 20,000 tourism-related businesses in Scotland (VisitScotland, 2010). Tourism is recognised by the Scottish Government and Scottish Enterprise as a priority industry.

86 Tourism is an important industry within the study area. In 2009, almost five million visitor trips were made to the area with an associated spend of approximately £1.3 billion. Tourism also accounts for a greater share of employment in Angus, East Lothian, Edinburgh and Fife than in Scotland (see Figure 23.10 below).



Figure 23.10: Employment in tourism as a % of total employment in the study area, 2008 (ONS, 2010d)

87 The study area benefits from coastal tourism with links golf courses⁵, Blue Flag⁶ beaches and walking routes such as the Fife Coastal Path being key drivers for the tourism economy. The Fife Coastal Path runs from the Forth

⁵ Links courses tend to be on, or at least very near to, a coast, and the term is typically associated with coastal courses, often amid dunes.

Estuary in the south, to the Tay Estuary in the north and stretches for 150 km. A usage and economic impact study of the Fife Coastal Path was undertaken from 2006 to 2007. The report concluded that an estimated 480,000 to 580,000 visits were made over a 12 month period by a wide variety of users for many different types of activities. Annual net expenditure was estimated at between £24 million to £29 million.

88 The Lomond Hills Regional Park extends over 65 square kilometres of west central Fife, taking in Fife's highest and most heavily-used open countryside. In the east it includes the Lomond Hills and in the west Lochore Meadow Country Park. The Park receives around 600,000 to 800,000 visits each year, approximately 400,000 of these to Lochore Meadows. The most popular activity is walking, taking place throughout the Park but with a particular emphasis on the Lomond Hills. Lochore Meadows provides the venue for more intensive recreational uses offering a wide range of activities including watersports, golf, fishing, horse riding, and a children's adventure play area. Watersports are carried out along the coastline, in particular from St Andrews and the East Neuk villages.

89 Dundee has a strong suite of tourist attractions, such as the City Art Gallery, Museum, Discovery Point, Verdant Works and the proposed V&A Gallery. The accommodation base within the city is important especially for business tourism.

23.9 Supply Chain Capacity

90 The potential business supply chain plays an important role in meeting the demand arising from the development of offshore wind farms. Various reports and action plans produced in Scotland and the rest of the UK identify the strengths and weaknesses of the supply base. For instance, Scottish Enterprise's report (AEA, 2010) stated that: *"There are a number of companies in Scotland with a high degree of technical skills and the ability to innovate. Many suppliers to the oil and gas sector are well placed to move into offshore renewables... Scotland has capacity in engineering, composite materials, steel fabrication, transportation and logistics, construction and marine civil engineering."*

91 The following is also of note in relation to the strength of the supply chain:

- Scottish firms are considered to be well positioned in relation to project management and development and have been successful in providing early stage support services, especially in the area of environmental assessment and planning advice (AEA, 2010);
- There are more significant gaps in some areas of manufacturing (Scottish Enterprise note to SQW, September 2011). The most significant gaps relate to turbine and cable manufacture. This market is dominated by the US, Spanish and German wind turbine manufacturers. The supply of components also tends to be through well-established procurement routes, meaning that overseas manufacturers will tend to work with regular suppliers to provide sub-assemblies or groups of components;
- Scottish Development International (SDI) is involved by securing inward investment in turbine manufacturing in Scotland. It takes time to establish the production facilities and then to demonstrate the reliability of the turbines to the market. The report Energy Industry Market Forecasts: Renewable Energy 2009-2014 (AEA, 2010) notes that *"Scottish suppliers provide some electrical and electronic equipment, towers and monopiles but the vast majority of high value components are still imported"*. This could change with a Scottish manufacturing base which would improve the opportunities for component supply;
- One of the largest public sector interventions by Scottish Enterprise and Highlands and Islands Enterprise to support the business supply chain relate to the projects identified in the National Renewables Infrastructure Plan. This is backed by a £70 million National Renewable Infrastructure Fund (N-RIF);
- The operations and maintenance phase lasts over the lifetime of the project and consequently the investment and jobs are longer term than construction or installation. It is likely that much of this investment and employment would be from within the study area;

- A database of companies within the offshore wind supply chain is currently being developed by Scottish Enterprise (and Highlands and Islands Enterprise). This currently has 410 companies registered in the Scottish offshore wind supply chain;
- Scottish Enterprise has also launched the Offshore Wind Expert Help programme and Offshore Wind Manufacturing Audits as well as a number of awareness raising events; and
- The recently published study on employment in the renewables sector (Scottish Renewables, 2012) states that *"renewable energy industry is already a significant employer in Scotland, supporting more than 11,000 employees"* with *"total employment in renewable energy development and supply chain in Scotland by technology"* associated with offshore wind estimated at 943 employees.

92 The proposed project would potentially be developed within this wider supply chain environment and have access to this wider support.

93 In terms of actual supply chain developments, the 2020 Routemap for Renewable Energy in Scotland (Scottish Government, 2011) describes some of the developments in the past year:

- Gamesa - has established an offshore wind technology centre in Bellshill, Glasgow;
- Doosan Power Systems –investment of £170m in Scottish wind power over the next 10 years. A Research and Development centre will be set up near Glasgow, creating 200 jobs, following which the company is looking to establish a manufacturing and assembly facility in Scotland. Doosan expects its offshore wind plans in Scotland to create up to 1,700 new jobs; and
- BiFab – has diversified and expanded to produce jacket foundations for the renewables sector, from operations at Methil, Burntisland and Arnish.

94 There is also a focus on reducing costs in offshore wind to make projects commercially viable and reduce risk. In this regard, the 2020 Routemap for Renewable Energy in Scotland (Scottish Government, 2011) makes reference to the Scottish Energy Laboratory⁷ co-ordinating the marketing of Scotland's R&D strengths, the Power Networks Demonstration Centre and International Technology Renewable Energy Zone. The main findings based on statements made by consultees during the consultation exercise relating to the supply chain are presented in Table 23.5 below.

⁶ Blue Flag refers to the voluntary eco-label awarded to beaches. The award is run by the Foundation for Environmental Education (FEE) for the sustainable development of beaches and marinas.

⁷ This is a network of test and demonstration facilities in Scotland across all key energy sectors.

Geography	Findings
Study Area	<p>In addition to the national initiatives there is a well-established supply chain initiative within the study area. East Coast Renewables, a strategic collaboration of local authorities (including all those in the study area) across the East Coast of Scotland, aims to maximise the economic growth potential of the emerging renewable energy sector.</p> <p>East Coast Renewables works in partnership with Scottish Enterprise (SE) and Scottish Development International (SDI) to develop the renewable energy sector and promote the east coast of Scotland as a location for investment.</p> <p>The project location means that some East Coast Renewables alliance partners will be more closely involved in the supply chain than others. However, from the consultations it is clear that all have much to offer either through skills development and/or the supply chain.</p>
Angus	<p>Angus has a number of oil and gas and engineering companies with the capacity to diversify into wind energy. There are also international energy companies such as Enertrag, Piggin and Rix with a presence in the area.</p> <p>The Montrose Port Authority is equipped to deal with a broad variety of commercial and oil related cargoes. The port plans to offer operation and maintenance services for offshore wind farms.</p>
Fife	<p>Fife is a strong player within the renewables industry as more companies choose to locate to Fife or existing companies diversify their skills and experience to take advantage of the growing renewables market. The Invest in Fife Renewables company directory currently has 48 registered companies; in addition there are over 150 engineering companies in the Fife region.</p> <p>Fife Council considers the region as ideally placed to capture a significant proportion of the investment required to construct the turbines required for both the Scottish Territorial Waters and Round 3 sites. Energy Park Fife is an attractive option for suppliers.</p> <p>Burntisland Fabrications Ltd (Bifab), Methil, Fife, is considered an example of a company that can win contracts across the Northern European market. It has applied its expertise of the oil and gas sector to the renewable energy market. BiFab demonstrates the potential of Scottish companies to attract new investment. Its success has helped to raise the profile of the Fife Energy Park where it will be expanding its capacity to 130 subsea jackets a year.</p>
Dundee	<p>Dundee City Council has been working in conjunction with Dundee Port Authority to develop and promote Dundee as a location for wind farm component manufacturing, construction and operation and maintenance since 2006. Some pre-planning has been put in place, for example, changes to the road network to service heavy items and conserving the area for opportunities from offshore wind. The main barrier for Dundee is the limited land base at the port, but this can be supplemented by sites outwith this area. However, investment and construction of facilities can only be implemented once decisions have been made in terms of the detail of the supply chain for turbines (nacelles, blades and towers), subsea structures and operation and maintenance.</p> <p>Further preparation of the supply chain is being made in terms of operation and maintenance options for the offshore wind farms in addition to the manufacturing and assembly, as these need to be in place from commencement of construction. Dundee and Highlands and Islands Airports are considering what they can offer in this area.</p> <p>However, firm decisions on the supply chain are dependent on grant of consent without which investment will not be forthcoming, for example, 'confirmed commercial interest' is a factor in securing investment from National Renewables Infrastructure Fund (NRIF) but such a confirmation could not occur prior to grant of consent.</p>

Table 23.5: Consultation findings

95 The findings from the consultation exercise suggest the keenness of the supply chain to engage with the proposed development.

23.9.1 Skills

96 The availability of skilled labour is a vital component of the effectiveness of the supply chain in Scotland. The jobs created will require a range of skills across the different phases of development.

97 Skills Development Scotland has published the Skills Investment Plan for the Energy Sector (Skills Development Scotland, 2011), which describes the main requirements for the sector. It reports that the main skills gaps are in

engineering (marine, structural, civil, structural and mechanical) leadership and management, project management, welders, turbine technicians and divers. The majority of these jobs require the equivalent of NVQ Level 3 qualifications. It is reported that there are around:

- 8,000 undergraduates in related subject areas along with 3,000 postgraduates;
- 25,000 to 30,000 learners in relevant subjects in Scottish Colleges; and
- 3,000 new apprenticeships start each year in engineering and energy related jobs.

98 Other activities to support skills include the Low Carbon Skills Fund, the Whitlock Energy Collaboration Centre at Carnegie College, which has produced 15-20 trained people a year and the launch of the Modern Apprenticeship Wind Turbine Technician framework. In addition, 12 universities are working together under the Energy Technology Partnership, which supports research and development.

99 To meet the additional demand of new offshore projects, a mixture of new employees to the labour market, those transferring from other types of work and retraining and others moving to Scotland will be required. Given the long duration of these projects and the long term opportunities, it will be important to promote the sector to ensure a future supply of skills.

100 The study area has a potential pool of skilled workers with the necessary experience to service the renewables industry. The private and public sector have been working together on a range of skills development initiatives to ensure renewables companies have access to suitably qualified staff.

101 In addition, the consultations highlighted a number of skills development activities in the study area relating to the offshore wind and renewables market. Some of the main initiatives identified are as follows (refer to Appendix 23.1: Socioeconomic Technical Report for additional information):

- University of St Andrews' proposal for a new Energy Materials Innovation and Knowledge Centre;
- University of St Andrews and University of Edinburgh collaboration (EaSTChem) research into fuel cell;
- Carnegie College Whitlock Energy Collaboration Centre;
- Kirkcaldy Training Centre, £17m Future Skills Centre combining engineering, construction, renewables and science skills;
- Fife Renewable Energy Skills Group (FREPS);
- East Lothian Learning Partnership (ELLP);
- Dundee University Centre for Renewable Energy (DUCRE);
- The Scottish Universities Physics Alliance (SUPA) Energy Theme; and
- Energy Training East brings together the universities and colleges of Tayside to offer training, and research and development expertise to support the renewable energy industry.

23.10 Impact Assessment

102 This section provides details of the estimated socioeconomic impact of the project on the study area and the rest of Scotland. This uses the methodology (set out in Section 23.7) and investment expenditure information to estimate the GVA and employment that would be associated with the development of the project.

23.10.1 GVA and Employment

103 The potential GVA and employment supported by the project is presented in this section. This is described in terms of the Present Value (i.e., the future value expressed in present terms by means of discounting) of GVA and in job years for employment impact (i.e., 20 full time equivalent jobs lasting 10 years are equivalent to 200 job years). The focus of this assessment is the study area and the rest of Scotland. The key inputs and assumptions used in the model can be found in Appendix 23.1: Socioeconomic Technical Report.

104 The estimates of project expenditure by sub-phase and geography are presented in Appendix 23.1: Socioeconomic Technical Report. The proportion of spend by geography for the low case scenario (i.e., total value of contracts that have been delivered, or are expected to be delivered, from within each geography, assuming the current supply chain) is presented in Table 23.6. The uncertainty regarding procurement particularly supplier selection and location has been taken into account in the development of these estimates.

Project phase	Expenditure in Study Area (%)	Expenditure in rest of Scotland (%)	Expenditure in rest of UK (%)	Expenditure elsewhere (%)
Consenting and Development:				
Consenting and development	25%	45%	25%	5%
Manufacture:				
Technical and commercial management	10%	60%	20%	10%
Supply: Turbines, transformers and towers and SCADA	0%	0%	50%	50%
Supply: Foundations	0%	0%	50%	50%
Supply: Cables	10%	0%	0%	90%
Supply: Substations	0%	0%	50%	50%
Construction/Installation:				
Installation: Foundations, met mast and turbines	10%	0%	0%	90%
Installation: Cable lay and testing and commissioning	10%	90%	0%	0%
Operation:				
Operation and maintenance	100%	0%	0%	0%
Other costs	0%	0%	100%	0%
Decommissioning:				
Decommissioning	20%	25%	25%	30%

Table 23.6: Proportion of spend by geography for low case

105 For the high case (i.e., the total value of contracts that could be secured with a stronger supply chain), the estimates of project expenditure by sub-phase remain the same as in the low case. The proportion of spend by geography for the high case is as presented in Table 23.7

Project phase	Expenditure in Study Area (%)	Expenditure in rest of Scotland (%)	Expenditure in rest of UK (%)	Expenditure elsewhere (%)
Consenting and Development:				
Consenting and development	25%	45%	25%	5%
Manufacture:				
Technical and commercial management	40%	40%	20%	0%
Supply: Turbines, transformers & towers and SCADA	60%	20%	10%	10%
Supply: Foundations	100%	0%	0%	0%
Supply: Cables	80%	0%	0%	20%
Supply: Substations	50%	20%	0%	30%
Construction/Installation:				
Installation: Foundations, met mast and turbines	10%	0%	0%	90%
Installation: Cable lay and testing and commissioning	10%	90%	0%	0%
Operation:				
Operation and maintenance	100%	0%	0%	0%
Other costs	40%	40%	20%	0%
Decommissioning:				
Decommissioning	40%	20%	20%	20%

Table 23.7: Proportion of spend by geography for high case

23.10.1.1 GVA

106 A summary of all the direct and indirect GVA and employment impacts associated with the Neart na Gaoithe project is presented in Table 23.9.

107 The construction phase of the project includes the consenting and development, manufacturing and the construction/ installation sub-phases. In total, the entire construction phase is anticipated to last eight years with consenting and development having commenced in 2008. The estimates indicate that the study area is likely to generate positive economic activity as result of the project.

108 The operational phase is expected to commence in 2015 and continue for 22 years (refer to Section 23.7.2). For the study area, the operation phase is estimated to generate lower GVA and employment compared to the construction phase (due to lower expenditure), however the GVA and employment is longer term. There are no GVA and employment estimates relating to the rest of Scotland because there is assumed to be no significant project expenditure in Scotland outside of the study area (for low and high low cases).

109 The decommissioning associated with repowering commences in 2037 and is projected to last for 3 years. There is a greater degree of uncertainty over the economic impacts generated from this phase within the study area economy.

110 Table 23.8 presents the predicted GVA impact over the lifetime of the project for the low and high case scenarios.

	Study Area (£m)			Rest of Scotland (£m)			Whole of Scotland (study area + rest of Scotland) (£m)		
	Direct	Indirect + Induced	Total	Direct	Indirect + Induced	Total	Direct	Indirect + Induced	Total
Low case									
Construction	20	10	30	26	19	45	46	29	75
Operation	8	4	12	0	0	0	8	4	12
Decommissioning	9	4	13	11	8	19	20	12	32
Low total	37	18	55	37	27	64	74	45	119
High case									
Construction	261	140	401	64	52	116	326	192	518
Operation	9	5	14	2	2	4	11	7	18
Decommissioning	18	8	26	9	6	15	26	14	40
High total	288	153	441	75	61	135	363	213	576

Table 23.8: Predicted Gross GVA impacts over project lifetime (£ millions, 2011 prices) – low and high case scenarios

- 111 The GVA impacts associated with the proposed project over its lifetime are summarised as follows:
- **Low case for study area - £55m of GVA** is generated in the study area over the project lifetime, of which over half is generated during the construction phase and just over 20% each is generated during operations and decommissioning;
 - **High case for study area** - total GVA potentially rises to just over £440m in the study area over the project lifetime, of which over 90% is generated during construction phase, approximately 3% during operations and the remainder during decommissioning;
 - **Low case for the whole of Scotland (including the study area) - £119m of GVA** is generated in Scotland over the project lifetime, of which just under two-thirds is generated during construction phase, 10% during operation and just over 25% during decommissioning;
 - **High case for the whole of Scotland (including the study area)** - the GVA potentially rises to over £570m in Scotland over the project lifetime, of which approximately 90% is generated during construction phase, approximately 3% during operations and the remainder during decommissioning.

Magnitude of Effect

- 112 Under the ‘low’ scenario, the magnitude of the additional GVA generated by the proposed project, both at the study area level and in rest of Scotland, is judged to be ‘low’. This is because the scale of impact at all stages of development (e.g., £54 million in the study area) would be relatively small, both in terms of overall GVA and GVA per head, and in terms of both absolute and proportionate impact.
- 113 Under the ‘high’ scenario the magnitude of the additional GVA generated is significantly higher than for the low scenario, with a total of £441 million predicted in the study area. The majority of GVA is associated with the construction phase, with additional GVA of £401 million predicted in the study area. On this basis, the magnitude of effect under the ‘high’ scenario is judged to be high.
- 114 The GVA impact is likely to be between the low and high scenarios, and an outturn for the study area of £250 million of additional GVA for the duration of the project is a median estimate. On this basis, the overall likely magnitude of effect is judged to be medium.

Vulnerability of Receptor

- 115 GVA is a main measure of economic wealth and prosperity. GVA per head is comparatively high in Edinburgh (compared to the Scottish national average), whilst it is below the Scottish average for the other local authority regions in the study area.
- 116 The overall level of GVA in the study area is derived from a broad range of economic activities including manufacturing, construction, transportation services, education, retailing, tourism, financial services, business and professional services, etc.
- 117 The project alone is not large enough to have a substantial impact on the overall level of GVA (or on the overall GVA per head) in the study area. The vulnerability to changes in GVA that could conceivably result from the project is therefore considered to be low. This level of vulnerability is the same for all phases of the development, as the scale and complexity of the relevant economies (study area, rest of Scotland, Scotland) are likely to be largely constant throughout the lifetime of the project.

Significance of Impact

- 118 The significance of impact is derived by combining the vulnerability and magnitude assessments. The GVA impact associated with the expenditure for the project as a whole is judged to be of moderate positive significance. Moreover, the level of significance on each of the phases of the project (construction, operation and decommissioning) is also judged to be of moderate positive significance.

GVA Overall Significance of Impact

- 119 The overall significance of the GVA on the economy relating to all the phases combined is set-out as follows (see Table 23.9). This relates to the low case scenario.

Source	Pathway	Receptor	Magnitude of effect	Vulnerability of receptor	Significance of impact	Qualification of significance
Neart na Gaoithe Wind Farm	Business supply chain	Study area and Scotland economy	Medium	Medium	Moderate positive significance	Impact has medium certainty and medium probability. No mitigation needed.

Table 23.9: Receptor specific assessment outputs – GVA

23.10.2 Employment

- 120 Table 23.10 presents the employment impacts over the lifetime of the project for low and high case scenarios. The results indicate that for the study area, the project expenditure would generate approximately 3,000 job years and a further 1,250 job years in the rest of Scotland. This gives a total of 4,250 job years in Scotland for the low case scenario. However, taking into consideration a high case scenario, then the project expenditure would generate just over 11,900 job years in the study area and a further 3,150 job years in the rest of Scotland. This gives a total of just over 15,000 job years for Scotland.

	Study Area			Rest of Scotland			Scotland		
	Direct	Indirect + Induced	Total	Direct	Indirect + Induced	Total	Direct	Indirect + Induced	Total
Low case									
Construction	357	177	534	392	361	753	749	538	1,287
Operation	1,143	963	2,106	0	0	0	1,143	963	2,106
Decommissioning	223	108	331	278	216	494	501	324	825
Low total	1,723	1,248	2,971	670	577	1,247	2,393	1,825	4,218
High case									
Construction	5,678	2,925	8,603	1,156	1,057	2,213	6,834	3,982	10,816
Operation	1,438	1,211	2,649	295	248	543	1,733	1,460	3,193
Decommissioning	445	215	660	223	173	396	668	388	1,056
High total	7,561	4,351	11,912	1,674	1,478	3,152	9,235	5,830	15,065

Table 23.10: Predicted employment impacts over project lifetime (job years) – low and high case scenarios

23.10.2.1 Employment Profile

121 A breakdown of the jobs generated by year in the study area and Scotland (including study area) for the low case scenario is shown in Figure 23.11 and Figure 23.12 below. The greatest number of jobs are estimated to be created during the construction phase (includes consenting and development; manufacture; and construction/installation). The operations phase is estimated to provide longer term employment over the lifetime of the project. The decommissioning phase is expected to provide further employment opportunities, albeit for a relatively short period of time compared to the operations phase.

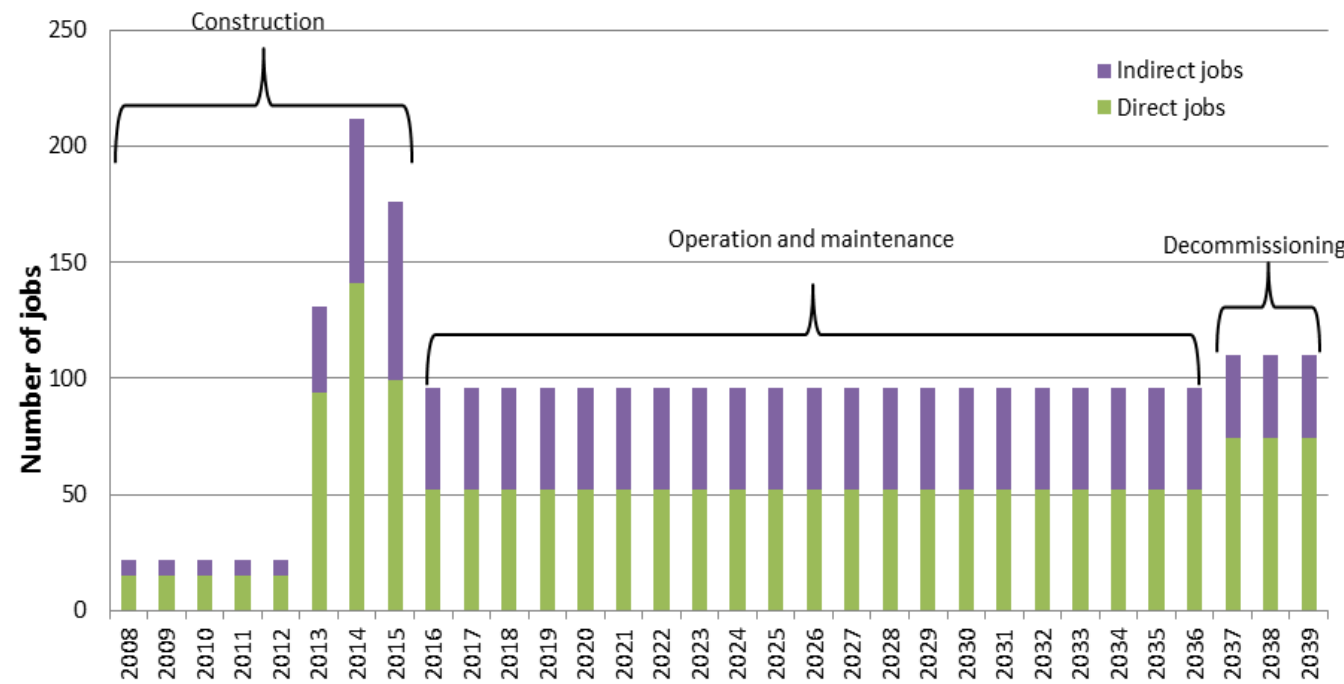


Figure 23.11: Predicted study area employment by year – low case scenario. Note: indirect jobs also include induced

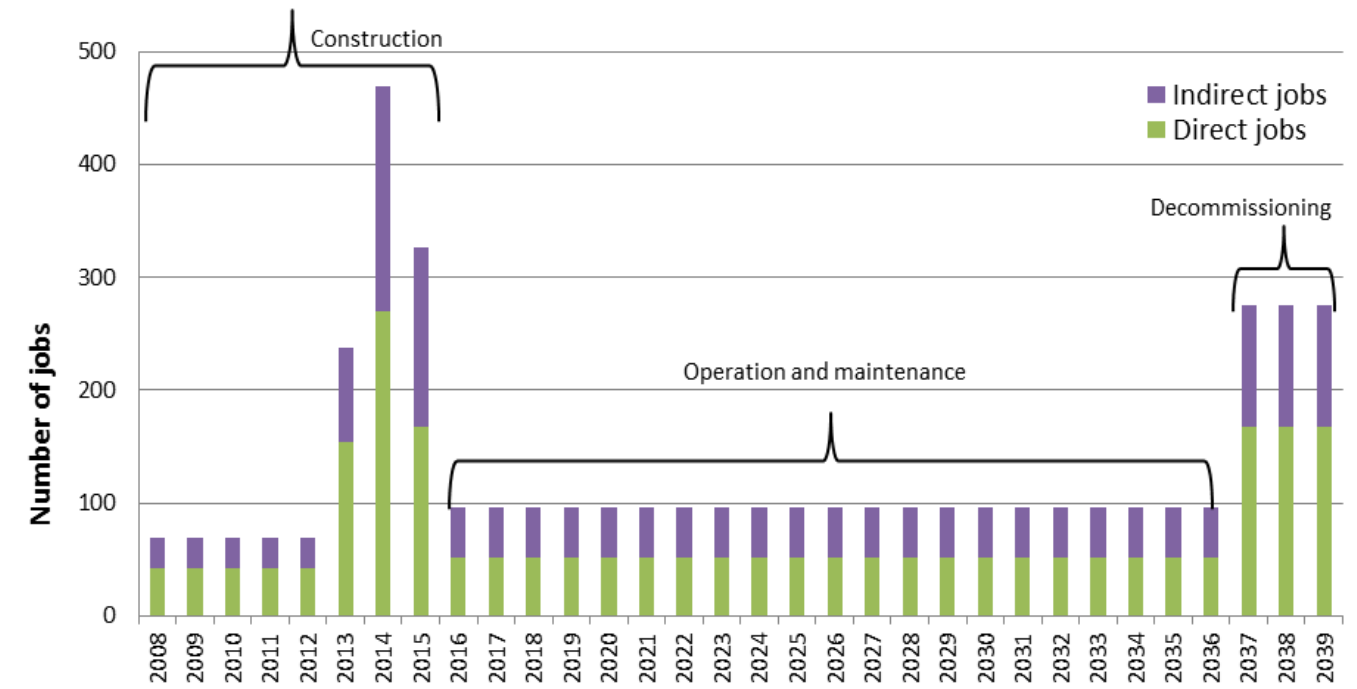


Figure 23.12: Scotland (including study area) predicted employment by year – low case scenario. Note: indirect jobs also includes induced

122 A breakdown of the jobs generated by year in the study area and Scotland (including study area) for the high case scenario is shown in Figure 23.13 and Figure 23.14 below.

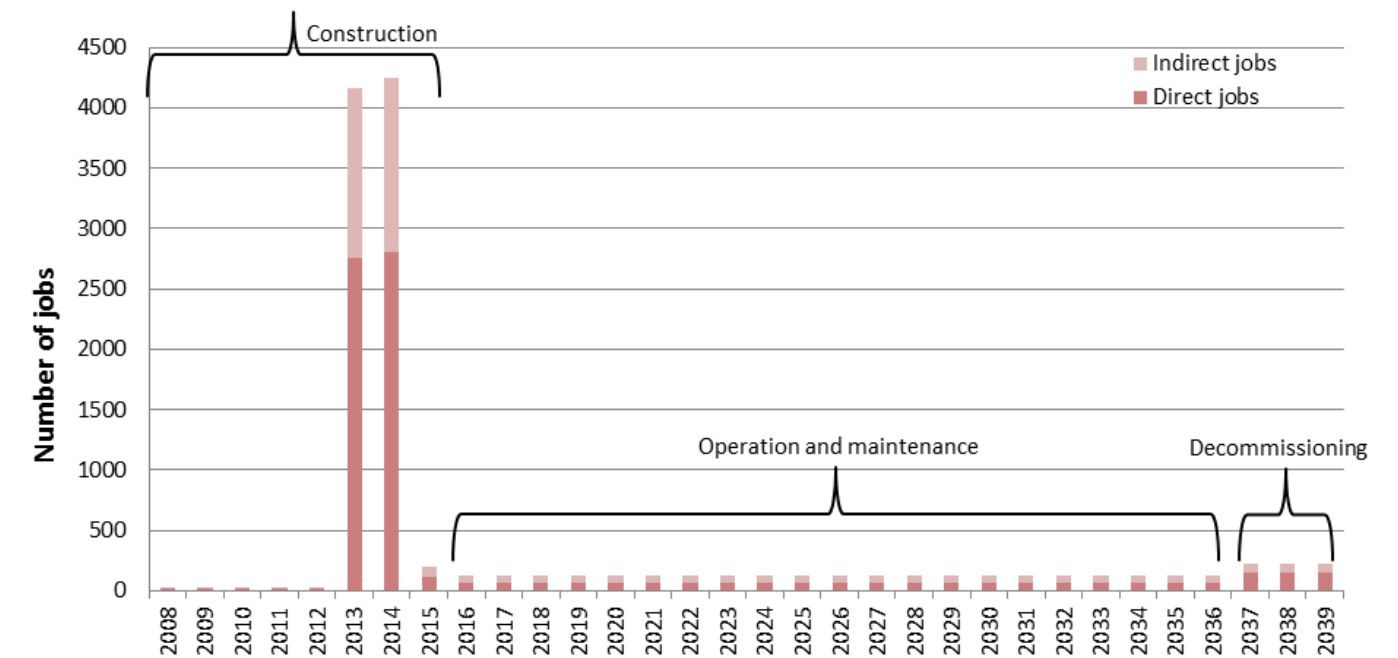


Figure 23.13: Predicted study area employment by year – high case scenario. Note: indirect jobs also includes induced

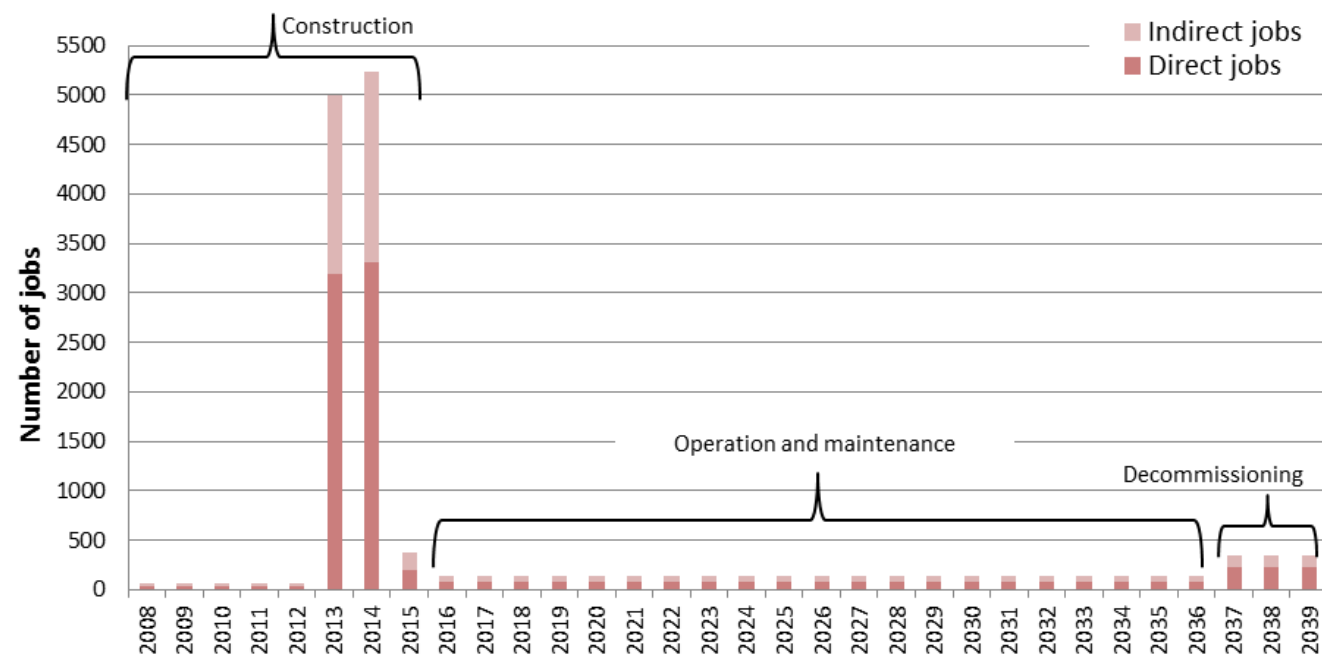


Figure 23.14: Scotland (including study area) predicted employment by year – high case scenario. Note: indirect jobs also includes induced

23.10.2.2 Employment Impact Summary

- 123 The employment impacts associated with the proposed project are summarised as follows:
- **Low case for study area** - the project is estimated to support just over 210 jobs in the peak year of construction phase (2014) reducing to approximately 100 jobs per year for operations (2016-2036). This rises to 110 jobs per year for decommissioning (2037-2039);
 - **High case for study area** - the project is estimated to support 4,250 jobs in the peak year of construction phase (2014), reducing to 145 jobs per year for operations (2016-2036). This rises to 220 jobs per year for decommissioning (2037-2039);
 - **Low case for Scotland (including the study area)** - the project is estimated to support nearly 470 jobs in the peak year of construction phase (2014) reducing to approximately 100 jobs per year for operations (2016-2036). This rises to 275 jobs per year for decommissioning (2037-2039); and
 - **High case for Scotland (including the study area)** - the project is estimated to support just over 5,200 jobs in the peak year of construction phase (2014), reducing to 145 jobs per year for operations (2016-2036). This rises to approximately 350 jobs per year for decommissioning (2037-2039).

23.10.2.3 Significance Assessment - Employment

Magnitude of Effect

- 124 Under the 'low' scenario just under 3,000 job years in total would be supported in the study area. This is judged to be a low magnitude effect. Under the 'high' scenario the total would be about four times greater, at just under 12,000 job years across the study area. This is assessed to be a high magnitude impact. The likely outcome is likely to be between the low and high scenarios.
- 125 In addition to the number of job years supported, the other factor to consider is the quality of jobs likely to result from the scheme. During all phases of the scheme, the nature of the skills required in the direct jobs is likely to be biased towards medium-to-high levels of technical skills and qualifications in engineering and construction. It is expected that the salaries paid to workers who fill these job vacancies will be above average, reflecting both the specialised nature of the skills needed and (for the offshore construction and development activities) the demanding physical environment where labour services are required.

126 Taking into account the number of jobs supported (as identified above), at both study area and Scotland level, and the likely bias of skills required in favour of higher levels of skill, the magnitude of the employment generated overall is considered to be of medium magnitude. However, due to the concentrated scale of potential jobs during the construction phase the magnitude of effect will be of high magnitude.

Vulnerability of Receptor

127 Employment is a main measure of economic activity, reflected in the importance attached to rates of employment and unemployment. The baseline level of employment in the study area is large, and is comprised of demand for labour across a wide range of skill types and qualifications levels. Also, the levels of unemployment and the availability of employment opportunities are very important for the economic wellbeing of communities, the study area and Scotland, particularly given the current levels of unemployment and priority of Government to encourage employment growth.

128 The balance between the size of the employment base of the study area and the poor current performance of the labour market, suggests that changes in employment are of medium vulnerability. This level of vulnerability is the same for all phases of the development, as the scale and complexity of the relevant economies (study area, rest of Scotland, Scotland) are likely to be largely constant throughout the lifetime of the project.

Significance of Impact

129 The employment impact associated with the scheme as a whole is judged to be of moderate positive significance. Moreover, the level of significance on each of the phases of the project (construction, operation and decommissioning) is judged to be of moderate positive significance.

130 The overall significance of the impact of employment (through job creation) on the economy relating to all the phases combined is set out below (Table 23.11).

Source	Pathway	Receptor	Magnitude of effect	Vulnerability of receptor	Significance of impact	Qualification of significance
Neart na Gaoithe Wind Farm	Business supply chain	Study area and Scotland economy	Medium	Medium	Moderate positive significance	Impact has medium certainty and medium probability. No mitigation needed.

Table 23.11: Receptor specific assessment outputs - Employment

23.10.3 Tourism

131 The likely impacts on visual amenity are presented in Chapter 21: Seascape, Landscape and Visual Impacts. Information on impacts on marine and coastal recreation impacted by the development is provided in Chapter 22: Other Users.

A summary of the findings of the consultation exercise on tourism and recreation relating to socioeconomic impacts associated with the project is presented in Table 23.12.

Summary of findings
The baseline section provides a profile of the main tourism and recreation assets and developments in the study area. Taking this into account, generally the project was not seen to be in conflict with existing and future tourism requirements due to the distance from shore. There is awareness that future tourism assets (such as Edinburgh Waterfront) should not be compromised by the drive to develop ports for the renewables sector (e.g., Leith Docks).
For Dundee, the Neart na Gaoithe development is not viewed as in conflict with tourism for the city. There is investment and development planned for Dundee, especially within the Waterfront area. The project is not viewed as affecting this.
During consultation no objections were raised to the proposed project on tourism grounds (including the cable route and where the cable comes onshore in East Lothian). There is considered to be no impact on tourism in East Lothian.

Table 23.12: Summary of findings from consultation exercise on tourism carried out in 2012

132 Key points from the desk review of research on impacts of wind farms on tourism are summarised in Table 23.13 below.

Summary of findings from desk review	
Source	Findings
Scottish Government research (Glasgow Caledonian University, 2008)	Although this report relates to onshore wind farms it provides useful insight on how the presence of wind farms can impact visitor decisions. It reports that the vast majority of visitors who had seen a wind farm suggested that the experience would not have any effect on their likelihood of visiting the area in the future. The survey findings were supported by the results of a literature review in the same study, which covers 40 reports in the UK and Ireland. This found no evidence to suggest a serious negative economic impact of wind farms on tourists. The overall conclusion of the study was that “there does not appear to be any robust evidence to suggest a serious negative economic impact of wind farms on tourism.”
North Hoyle Offshore Wind Farm (Written evidence to Select Committee on Innovation, Universities, Science and Skills, 2008)	The survey gauged the opinions of residents and visitors in the Rhyl and Prestatyn areas towards the North Hoyle Offshore Wind Farm in 2004. A similar survey had been carried out in 2003, before the wind farm was in position. This represented the baseline. The support for the North Hoyle Offshore Wind Farm increased with 73% of residents now stating they support the project, compared with 62% of residents before the wind farm was operational. A total of 71% of visitors state they are in support of North Hoyle and none of the 56 visitors interviewed state they opposed the wind farm. Two thirds of residents (67%) state that the presence of the North Hoyle Offshore Wind Farm has had no effect on the number of people visiting or using the area, with people more likely to state there is an increase rather than a decrease in numbers (11% compared with 4% who state decrease).
Research on the potential impact of wind farm development in North Devon on tourism (University of the West of England, 2004)	A total of 379 day visitors and tourists were interviewed face-to-face. The majority of tourists surveyed in North Devon (87%) reported that the presence of a wind farm would neither encourage nor discourage them from visiting. Of the remaining 13%, slightly more would be encouraged to visit because of the presence of a wind farm. The majority of North Devon respondents thought that the wind farm would have no overall impact on the quality of their experience.
(BWEA, 2006)	This report identifies key surveys relating to wind farms and tourism in Scotland, Cornwall and Cumbria. On the whole, the findings indicate that the vast majority of visitors are not discouraged from visiting an area because of wind farm developments.

Table 23.13: Summary of findings from desk review

23.10.3.1 Tourism Assessment

Magnitude of Effect

133 The areas affected by construction-phase activities that may be enjoyed by day visitors and tourists would be small-scale, and of temporary duration. The overall magnitude of effects is therefore assessed to be negligible.

Vulnerability of Receptor

134 Day visitors and tourists who undertake recreation activities will be able to change their activities (by modifying their route, or moving a short distance to an unaffected area) without any significant detriment to their enjoyment or the incurring of any significant cost. In economic terms, there is a wide availability of equally acceptable substitutes (e.g., as identified in the baseline section) within the study area for recreational activities that may be displaced during the construction phase. The overall vulnerability of day visitor and tourist receptors is therefore assessed to be negligible.

Significance of Impact

135 Given the negligible magnitude and vulnerability, the effect of displacing recreational activities relevant for day visitors and tourists is assessed to be **not significant**.

136 In practical terms, no significant impact during the construction phase is expected in terms of the numbers of day visitors and tourists that come to the study area or the duration of their visits or their propensity to make a repeat visit. Likewise, no significant impact is expected in terms of the volume and value of day visitor and tourism expenditure. Therefore, the impact during the construction phase on businesses in the study area that benefit from land-based day visitor and tourism expenditure is assessed to be **not significant**.

137 The duration of the operational phase of the wind farm will be significantly longer than the construction phase. Even taking this into account, the assessment concludes that the impact on tourism receptors is **not significant** for reasons given above.

23.11 Enhancement and Residual Impacts

138 Mitigation is applied on impacts assessed to be of moderate negative significance. The socioeconomic assessment has concluded that GVA and employment impacts are positive. Therefore, no mitigation is required and the residuals are as per the assessment conclusions (for GVA, employment and tourism).

139 Of more relevance is the concept of ‘enhancement’ of impacts. Maximising positive impacts or minimising ‘not significant’ negative impacts is defined as enhancement.

140 The main measure identified would be to maximise local employment opportunities, as far as possible, through liaison with public sector bodies (e.g., Scottish Enterprise), and through other activities that raise awareness of the opportunities that the proposed project provides. This is likely to increase potential GVA and employment outcomes above those predicted in the “low” case scenario.

141 This is likely to have a positive impact on the estimates of retained income and employment within the study area and Scotland. These impacts will have a direct effect on other social and economic conditions in the study area. Greater employment opportunity is likely to generate more local income and, in turn, help to support the population, local business supply chain and the provision of services.

23.12 Cumulative and In-Combination Impacts

142 The estimates of economic activity associated with investment in the Neart na Gaoithe project are based on the capacity of the supply chain to meet the demand for goods and services during the different phases of the project. The potential for detrimental cumulative impact is probably most acute during the development phase: during this phase, demand for labour and other resources would be at a peak, and there may be constraints in the supply chain if other offshore wind farm development projects compete for the same resources (such as skilled labour, capacity among construction contractors, capacity for harbouring facilities, etc.). The scale of these constraints mainly depends on levels of investment, the availability of skills now and in the future, and other factors.

143 The other offshore wind farm developments which are considered to have a cumulative interaction are the Inch Cape Wind Farm and Firth of Forth Round 3 Zone 2 developments, as described in Chapter 5: Project Description.

144 The cumulative effect on the GVA and employment impacts from Neart na Gaoithe depend on the extent to which the supply chain has the capacity to meet demand from a number of other offshore wind farm projects that may place demands on the supply chain over a similar timescale.

145 In this sense, the cumulative impact depends on the timing of other projects and their competing demand. For example, a significant increase in demand over a given time horizon may reduce the capacity (or appetite) of the Scottish supply chain to bid successfully for all of the contracts that might be available from a range of offshore wind farm projects. This, in turn, might result in more procurement from outside Scotland, which in turn implies the displacement of potential economic activity from Scotland to other areas. This would potentially lead to a reduction in the number of jobs and amount of GVA supported by Neart na Gaoithe compared to the estimates provided in Section 23.10.

146 A potential further cumulative impact could occur if Neart na Gaoithe were to share any elements of the operations and maintenance support with another operator. This could provide economies of scale and

associated potential financial benefit to the operators, but would reduce total operational expenditure and, as a consequence, the employment and GVA impacts in the local economy.

147 With regards to skills, if other major offshore wind farm projects are approved with development time profiles that overlap significantly with Neart na Gaoithe, there might be excessive competition for skills in the study area that result in shortages of skilled labour. This, in turn, could result in contracts being awarded elsewhere or additional labour coming into the local area temporarily to meet the shortages. If this occurred to any significant degree, it could potentially result in a reduction in the potential number of jobs and amount of GVA supported by Neart na Gaoithe compared to the estimates provided in Section 23.10.

23.12.1 Results of the Cumulative Impact Assessment

148 The assessment hinges on the capacity of the study area to supply resources. The study area may also have opportunities to supply other wind farms with similar services.

149 Meanwhile, there have been several significant recent announcements of additional investment in the capacity of the offshore renewables supply chain within the study area. Some of the relevant announcements include:

- Mitsubishi Power Systems announced in December 2010 the creation of a Centre for Advanced Technology in Edinburgh, involving investment of circa £100 million and the creation of 200 jobs. Initially, the Centre will focus on research into renewables technologies, but by 2015 the Centre is expected to have embarked upon mass production, with the creation of hundreds more jobs.
- Samsung Heavy Industries announced in January 2012 a £100 million investment in an offshore wind manufacturing facility at Methil in Fife, expected to create 500 new jobs. The investment is a collaboration between Samsung and David Brown Gear Systems, based in East Kilbride, to supply gearbox systems for its next generation offshore wind turbines.

150 Other investments have been announced elsewhere in Scotland, including a research facility in Glasgow by Spanish engineering company Gamesa. The same company has recently announced the Port of Leith, Edinburgh as the site for its new UK plant for the manufacture of wind turbines. The investment in the Port of Leith is expected to be £150 million, creating 800 jobs (Scottish Government, 2012).

151 Further announcements regarding other investments in offshore manufacturing and development capacity are expected over the next 12 months. This indicates that there are both serious commitments and future investment intentions from among major overseas engineering and technology companies, as well as locally owned companies that together will provide a major augmentation to the supply chain capacity and skills available in the study area.

152 On this basis, the cumulative impact assessment has concluded that the effects on the economy, GVA and employment to be of moderate positive significance.

23.12.1.1 Tourism

153 There is limited evidence of the effects of the visual impacts of wind farm developments on tourism, and even less on the cumulative impacts. Any assessment is therefore highly uncertain.

154 For tourism and recreation, the primary cumulative impact would occur in terms of interaction with the other proposed Firth of Forth development zone offshore wind farm schemes. The potential for cumulative impacts is caused by both a wider spread and an increased density of turbines.

155 The sensitivity of tourists to the extended cumulative visual impact of all three offshore wind farms would be marginally higher than for Neart na Gaoithe alone. The sensitivity would remain negligible, though the magnitude of the impact on tourism would increase marginally as a result of changes to the aggregate visual effect. The number of tourists exposed would remain the same, as would the duration of the impact. On this basis the magnitude would be negligible. The significance would remain as **not significant**.

23.12.1.2 Other Cumulative Impacts

156 The cumulative impact with the other offshore wind farm schemes in the Firth of Forth and Tay area would result in a more significant increase in employment opportunities within the study area. This in turn may produce moderate impact on levels of income, population and, potentially, house prices.

157 The combined effect of the other Firth of Forth development zone projects proceeding also potentially increases the likelihood of attracting further related investment and employment in support services. That is, by providing a critical mass or cluster of activities that also has the potential to win work elsewhere, additional investment and employment opportunities could be generated.

158 Cumulatively, Neart na Gaoithe, Inch Cape and the Firth of Forth Round 3 Zone 2 wind farms comprise a significant proportion of the UK's offshore wind capacity, and the area around them will have the opportunity to obtain experience that not only creates direct employment but could sell services elsewhere in the world.

23.12.2 In-Combination Impacts

159 The assessment of in-combination impacts considers the resilience of expected socioeconomic outcomes associated with Neart na Gaoithe given that potential competition for resources might arise at various stages with other major development projects, such as from sectors including offshore oil and gas.

160 During the Scoping Stage of the EIA assessment offshore oil and gas development was scoped out. This was because there are no areas close to Neart na Gaoithe that are currently active for oil and gas exploration or development. However, from a socioeconomic perspective it is appropriate to consider whether potential oil and gas development further afield, but which might still be served by resources from the study area, might compete with Neart na Gaoithe for resources.

161 Another aspect that might potentially be a factor is the expansion or contraction of capacity from the ports and harbours sector, which the Neart na Gaoithe development is expected to require during each stage of its development. However, at this stage there are no known proposed schemes affecting port and harbour capacity that are of sufficient scale to affect the assessment of likely socioeconomic impacts provided earlier in this chapter.

162 The potential for in-combination impacts is relevant to each stage of the proposed Neart na Gaoithe project, but is probably most acute during the development phase, which is a peak phase for investment and the utilisation of supply-side resources, including physical assets (such as port and harbour capacity) and labour supply.

163 A particularly relevant consideration to the assessment of in-combination impacts is the potential for the study area to attract new investment that would be dedicated to increasing supply-side capacity. Examples of investment of this type include the announcements by Mitsubishi Power Systems and Samsung Heavy Industries for over £200 million of investment in the study area that together provide a significant augmentation of the dedicated capacity of the study area to respond to opportunities such as Neart na Gaoithe. The announcements of new levels of dedicated study area capacity are a significant factor with respect to the consideration of in-combination impacts: with such investment, it is far less likely that offshore wind projects fail to compete for necessary resources, as this additional capacity will have been put in place specifically in order to respond to the opportunities created by the expansion of offshore wind farm resources.

164 Based on this qualitative analysis, the conclusion of the in-combination assessment is that the scale of socioeconomic impacts that are estimated to follow for the study area if the Neart na Gaoithe project proceeds are not at any significant risk from the interaction with other (non-offshore wind farm) types of investment projects.

165 On this basis, the result of the in-combination assessment has concluded that the impact on the economy, employment and GVA is of **moderate positive significance**. As such, the in-combination effects on GVA and employment are considered to be of the same level of significance as concluded in the assessment of Neart na Gaoithe (as presented in Section 23.10).

23.12.2.1 Summary

- 166 Whilst the cumulative impacts of the three offshore wind farms will be greater than one on its own, there is likely to be a diminishing marginal loss of value.
- 167 In relation to the cumulative impacts of project expenditure, the phasing of the projects should mean that there is a lower chance of supply constraints reducing the potential employment and GVA impacts generated by the investment in the development of the project. The cumulative impact is of **moderate positive significance** for the economy.
- 168 For tourism, the cumulative impact may have a slightly greater aggregate impact than that of the supply chains, and this could result in a small overall reduction in tourism activity. However, the ready availability of substitutes means that this risk is small, therefore it is considered that the contribution of the proposed project to this remains of **moderate positive significance**.
- 169 Finally, the cumulative effect of all projects being serviced from the same area may provide a more attractive base for attracting investment and for the development of sector. Increased employment opportunities and attracting new people and skills, would be expected to have **moderate positive significant** impacts on levels of employment, population and income.
- 170 We would therefore expect the cumulative effect to have a positive effect on social and economic conditions within the study area and create significant opportunities for employment across Scotland, although the timing of construction and installation activities will be critical in determining the extent of effect.

23.13 Monitoring

- 171 It is suggested that economic benefits are monitored for the study area and Scotland. This can be done by keeping a record of all supplies procured, value, location and length of contract. The data could be collated and analysed on a regular basis to provide evidence as to the economic benefits that have accrued to the study area and Scotland.

23.14 Summary and Conclusions

23.14.1 GVA

- 172 The positive GVA (direct, indirect and induced) impacts associated with the proposed project over its lifetime are summarised as follows:
- **Low case scenario for study area** - £54m of GVA is generated in the study area over the project lifetime, of which over half is generated during the construction phase and just over 20% each is generated during operations and decommissioning.
 - **High case scenario for study area** - GVA potentially rises to just over £440m in the study area over the project lifetime, of which over 90% is generated during construction phase, approximately 3% during operations and the remainder during decommissioning.
 - **Low case scenario for Scotland (including the study area)** - £118m of GVA is generated in Scotland over the project lifetime, of which just under two-thirds is generated during construction phase, 10% during operation and just over 25% during decommissioning.
 - **High case scenario for Scotland (including the study area)** - the GVA potentially rises to over £570m in Scotland over the project lifetime, of which approximately 90% is generated during construction phase, approximately 3% during operations and the remainder during decommissioning.
- 173 The vulnerability to changes in GVA that could result from the project is considered to be 'low'. This level of vulnerability is the same for all phases of the development, as the scale and complexity of the relevant economies (study area, rest of Scotland, Scotland) are likely to be largely constant throughout the lifetime of the project.

- Under the 'low' scenario, the magnitude of the additional GVA generated by the proposed project, both at the study area level and in the rest of Scotland, is judged to be 'low'. This is because the scale of impact at all stages of development (e.g., £54 million in the study area) would be relatively small, both in terms of overall GVA and GVA per head, and in terms of both absolute and proportionate impact.
- Under the 'high' scenario the magnitude of the additional GVA generated is significantly higher than for the low scenario, predicted to be up to £441 million in total in the study area. This is particularly the case during the construction phase, where additional GVA of £401 million might accrue to the study area. On this basis, the magnitude of effect under the 'high' scenario is judged to be high.

- 174 The likely outturn for GVA impact is likely to be between the low and high scenarios, and an outturn for the study area of £250 million total additional GVA is a median estimate. The GVA impact associated with the expenditure for the lifecycle of the project is considered to be of **moderate positive significance**. The level of significance on each of the phases of the project (construction, operation and decommissioning) is also judged to be of **moderate positive significance**.

23.14.2 Employment

- 175 The results indicate positive employment impacts for the study area. The project expenditure would generate approximately 3,000 job years in the study area and a further 1,250 job years in the rest of Scotland. This gives a total of 4,250 job years in Scotland for the low case scenario. However, taking into consideration a high case scenario, then the project expenditure would generate approximately 11,900 job years in the study area and a further 3,150 job years in the rest of Scotland. This gives a total of just over 15,000 job years for Scotland. The likely final number of job years created will lie between the high and low scenarios.
- 176 Apart from the number of job years supported, the other factor to take into consideration is the quality of the jobs that are likely to result from the scheme. Taking into account the number of jobs supported (as identified above), at both study area and Scotland level, and the likely bias of skills required in favour of higher levels of skill, the magnitude of the employment generated overall is considered to be of medium magnitude. This magnitude of impact will vary, however for the development phase, the concentrated scale of potential job impacts implies that the effect will be of high magnitude.
- 177 The employment impact associated with the scheme as a whole is judged to be of **moderate positive significance**. The level of significance on each of the phases of the project (construction, operation and decommissioning) is judged to be of **moderate positive significance**.

23.14.3 Tourism

- 178 No significant impact during the construction phase is expected in terms of the numbers of day visitors and tourists that come to the study area or the duration of their visits or their propensity to make a repeat visit. Likewise, no significant impact is expected in terms of the volume and value of day visitor and tourism expenditure. Therefore, the impact during the construction phase on businesses in the study area that benefit from land-based day visitor and tourism expenditure is assessed to be **not significant**. The overall assessment of operations and decommissioning effects on tourism receptors is also **not significant**.

23.14.4 Overview of Impacts

- 179 An overview of economic impacts (direct, indirect and induced) and their assessed level of significance, including cumulative and in-combination impacts, are detailed in Table 23.14 and Table 23.15.

Source	Pathway	Receptor	Significance	Cumulative/in-combination impact significance	Qualification of significance
Neart na Gaoithe Wind Farm	Business supply chain	GVA - study area and Scotland	Moderate	Moderate	The project will likely produce a significant positive increase in GVA for the study area and the other areas of analysis. The scale of overall change will be proportionately small, however, and will be concentrated in the development phase.
Neart na Gaoithe Wind Farm	Business supply chain	Employment - study area and Scotland	Moderate	Moderate	The project will likely produce a significant positive increase in employment in the study area, although the extent of this impact is subject to a wide range of potential outcomes depending on where development phase contracts are placed. The majority of jobs created are expected to be above existing benchmark averages in terms of average earnings per worker, reflecting the skill profile of the expected job opportunities.

Table 23.14: Summary of significance

180 The assessment for tourism is summarised in Table 23.16.

Source	Pathway	Receptor	Assessment
Neart na Gaoithe Wind Farm	Tourists	Tourism economy – study area	Based on the qualitative assessment, this is not significant. The ready availability of alternative options for tourists limits the potential scope of impact, as does the temporary nature of the main source of potential adverse impacts.

Table 23.15: Summary assessment

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Appendices

Appendix 23.1: Socioeconomic Technical Report