

20 WIND FARM SOCIO-ECONOMICS, TOURISM AND RECREATION

20.1 INTRODUCTION

1. This Section sets out the potential socio-economic effects arising from the development of the Wind Farm. The assessment has been undertaken by SQW. Socio-economic effects associated with the OfTW are assessed in Section 29: Offshore Transmission Works Socio-economics of this ES.
2. This Section of the ES is supported by the following documents:
 - Annex 20A: BOWL Socio Economic Assessment – Technical Report.
3. This Section includes the following elements:
 - Assessment Methodology and Significance Criteria – detailing the approach taken to assessing the potential effect of the Wind Farm on economic conditions and tourism/recreation in the Study Area;
 - Baseline Description – a review of relevant data and documents establishing the current economic and tourism/recreation context in the Study Area;
 - Assessment of Potential Effects – the presentation of the potential economic and tourism/recreation effects of the Wind Farm including Gross Value Added (GVA) and employment. Where appropriate consideration has been given to the inter-relationship of effects namely the effects of seascape, landscape and visual effects on tourism, and the effects on marine mammals with respect to tourism. These inter-relationships are noted throughout this Section where applicable;
 - Mitigation Measures and Residual Effects – the actions required to mitigate and/or enhance potential effects of the Wind Farm;
 - Summary of Effects – overview of the effects of the Wind Farm on economic and tourism/recreation baseline conditions;
 - Assessment of Cumulative Effects – consideration of how the inclusion of other major projects could influence the conclusions on effect;
 - Statement of Significance – a brief summary statement concluding the assessment; and
 - References.
4. The assessment investigates the potential positive and negative socio-economic effects of the Project on aspects of the local, regional and national economies including:
 - Potential employment effects;
 - Economic value as measured by GVA¹;
 - Potential effects on tourism and recreation activity; and
 - Other social indicators.

¹ Gross Value Added is defined by the Office for National Statistics: “the difference between output and intermediate consumption for any given sector/industry. That is the difference between the value of goods and services produced and the cost of raw”.

5. At this stage, many development and procurement decisions are still to be made. Changes in the anticipated expenditure or procurement patterns from those anticipated during the assessment will change the associated estimates of employment and GVA. The effect on employment through the supply chain depends critically on the design, construction and operation decisions that are yet to be taken, and on the extent to which Scottish companies are able to secure contracts.

20.2 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

20.2.1 GEOGRAPHICAL SCOPE

6. With regard to the economic assessment of expenditure associated with the Wind Farm, the potential effects may be applicable over a wide area. The Study Area is defined as covering the Local Authority areas that border the Moray Firth in which the Project is located; Moray, Highlands and Aberdeenshire. Aberdeen City is also included because of its number of energy-related businesses and proximity to the Project. Assessing any effect beyond these areas is likely to be associated with weaker evidence of effect, although due to the large scale investment associated with this Project, the potential employment and GVA that this expenditure supports is also considered for Scotland, and the UK.
7. In regard to tourism, the assessment is also restricted to the four Local Authority areas but to some extent the scope is defined by the findings of other assessments, such as the SLVIA (Section 14), which defines a study area of 40 km from the Wind Farm Site.
8. For the purposes of the assessment of tourism, the Study Area is defined as covering the Local Authority areas; Moray, Highlands, Aberdeenshire and City of Aberdeen (Figure 20.1).

20.2.2 METHODOLOGICAL SCOPE AND LIMITATIONS

9. The economic estimates are based on the total expenditure on each sub-phase of the Project (i.e. consenting and development, manufacture of substructure, supply of cables etc. (see Table 20.2) provided by the developer and based on their knowledge at the time. Economic information relating to the Wind Farm is presented in the assessment below.
10. There are no specific statutory guidelines or requirements for the assessment of socio-economic effects set out by the relevant EIA Regulations, or in any other statutory or advisory guidance on the preparation of EIAs. The economic strategy for Scotland and Scottish Planning Policy 6 (SPP6) provided a much stronger emphasis on economic activity and encouraged due effect assessment alongside the environmental. For example, the Scottish Government in SPP6 stated that:

“Applications should include details of the environmental, social and economic benefits that will arise from the project, both locally and nationally, including the overall number of jobs and economic activity associated with the procurement, construction and operation of the development. Planning authorities should consider whether any

such benefits could or should be secured by way of a planning condition or planning agreement”.

11. This fitted with the priority of the Scottish Government to grow the Scottish economy and, more particularly, with the published policy statement “Securing a Renewable Future: Scotland’s Renewable Energy”, and subsequent reports from the Forum for Renewables Development Scotland (FREDS) 2003, all of which highlight the manufacturing potential of the renewables sector. However, there remains a lack of firm guidance, for example, SPP6 is superseded by the Scottish Planning Policy (SPP) 2010 and the same requirements are not detailed within SPP as it is intentionally a short, overarching document. SPP also relates to land use planning and as such does not fully cover offshore developments, although the Wind Farm section does suggest that development plans are likely to include the effect on the local and national economy and tourism and recreation interests. Recent work by MS is looking to develop a baseline and gap analysis for socio-economic data for offshore renewables. This should help to inform the socio-economic effect assessments at a Project level in due course.
12. The scope of the economic element of the assessment is to estimate the significance of the employment and GVA that would be associated with the expenditure made in relation to the construction, operation and decommissioning of the Wind Farm. This is subsequently referred to as the economic effect.
13. It is not within the scope of this work to assess any changes in electricity generation activity elsewhere which may occur as a result of the Wind Farm. For example it does not consider whether the electricity produced will be replacing other sources (in Scotland or the rest of the UK), what these other sources might be and any employment or GVA that would have been associated with them.
14. In addition, the Project will also receive funding through renewable energy incentives. This has implications for expenditure on other goods and services in the economy and therefore also on employment and GVA. It is not within the scope of this assessment to assess these wider effects.
15. Given that important design and procurement decisions have not been made to date, there is a wide range of potential effects. It is not possible or appropriate for this analysis to provide an indication of who the successful contractors might be or where they might be based. The assessment should be considered as indicative of the pattern of expenditure anticipated, but may not reflect the actual procurement decisions when they are made.
16. The estimates are based on the expenditure anticipated by BOWL at the time of the assessment and any changes in these figures (in the total or on the Project phases) will directly change the estimates of both GVA and employment.
17. The results are based on the full development of the proposed 1,000 MW Wind Farm. If the full proposal is not developed, for example if there are fewer turbines and less generation capacity installed than currently planned, then the associated expenditure and employment would be reduced. This would be broadly proportionate to the reduced scale of the Project, but economies of scale would

mean that the reductions in expenditure would be slightly less than the reduction in the scale of the development.

18. The results are also based on a realistic assessment of the ranges of expenditure and employment that would be supported. Over time, as further decisions are taken on the contractors and the types of manufacture, construction, and operations and maintenance used, the estimates of economic activity will become more refined.
19. The tourism assessment is desk-based and has been undertaken using the reports and other literature set out in the reference section, supplemented with the consultations set out in Table 20.1.
20. The potential effects on tourism are informed by the SLVIA (Section 14). The Moray and the Orkney Isles were scoped out of the visual effect assessment and are therefore excluded from the tourism assessment. Dolphin tourism is also a valuable part of the tourism economy and effects on dolphin behaviour could have implications for tourism. The assumptions on this are based on the results of the Marine Mammals assessment (see Section 12).
21. Recreational sailing is assessed within the Shipping and Navigation Assessment (Section 18) and is not covered in this Section.

20.2.3 CONSULTATION

22. A summary of the consultations undertaken with various organisations relevant to the socio-economic assessment, including the gathering of baseline information and assessment of potential effects is provided in Table 20.1.

Table 20.1 Summary of Consultations Undertaken

| Consultee | Summary of Consultation Response | Project Response |
|-------------------------------------|---|---|
| Aberdeenshire Council | Provided views on the strength of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Caithness and Sutherland Enterprise | Provided understanding of tourism and supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| The Highland Council | Provided understanding of the strength of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Highlands and Islands Enterprise | Provided understanding of the strength of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Moray Council | Provided understanding of the strength of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Moray Firth Partnership | Provided understanding of the strength of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Royal Yacht Association | Provided understanding of the level of activity in the study area | Combined with desk research to inform tourism effect assessment. |

| Consultee | Summary of Consultation Response | Project Response |
|-----------------------------|---|---|
| Scottish Enterprise | Provided understanding of the supply chain | Combined with desk research and modelling to inform economic effect assessment. |
| Skills Development Scotland | Provided overview of activities being supported to develop skills in the study area | Combined with desk research and modelling to inform economic effect assessment. |
| VisitScotland | Provided overview of profile of tourism in the study area | Combined with desk research to inform tourism effect assessment. |

20.2.4 ASSESSING THE EFFECT OF PROJECT EXPENDITURE

23. The Wind Farm development represents a major investment in plant, skills and services. This demand will be met to some extent by businesses based in Scotland, although significant elements are likely to be sourced from elsewhere in the UK and overseas. The extent to which Scottish based businesses can benefit from this demand will depend on a number of factors, such as their capability, experience, skills and capacity.
24. In order to assess the potential employment and GVA that could be generated in Scotland and in the local area, estimates of the total expenditure on each sub-phase of the Project (i.e. consenting and development, manufacture of substructure, supply of cables etc. (see Table 20.2) were provided by BOWL, based on their knowledge at the time.

Table 20.2 Project Phases and Sub-phases used

| Phases | Sub-Phases |
|----------------------------|--|
| Development | Management Site Investigation Engineering & Grid Met Mast EIA Financial Close |
| Manufacture | Technical and commercial management Supply: Turbines, transformers & towers Supply: Substructure Supply: Array Cables Supply: Onshore substation Supply: OSPs |
| Construction | Technical and commercial management Installation: Wind turbines Transportation & Logistics Onshore assembly Installation: Array Cable lay Installation: Foundations & Met Mast Testing & commissioning |
| Operations and Maintenance | Onshore Facilities Equipment/Consumables Insurance Spare parts |

| Phases | Sub-Phases |
|-----------------|--|
| | Maintenance Personnel Mgt/ Administration Marine Vessels / Helicopters Engineering Services |
| Decommissioning | Decommissioning activity |

25. Estimates of the percentage of this expenditure (for each of these sub-phases) that were likely to be delivered by businesses based in the Study Area, in Scotland and in the rest of the UK were also provided by the developer.
26. Given the uncertainties involved, this was done under two scenarios. Both scenarios assume the full development of the proposed 1,000 MW Wind Farm (and the full expenditure), but differ in the proportions of expenditure made in the local area and Scotland.
27. If the full proposal is not developed then the associated expenditure and employment would be reduced. This would be broadly in proportion to any reduction in the scale of the Project, but economies of scale would mean that the reductions in expenditure would be less than the reduction in the scale of the development. The scenarios used are:
 - **Low case** - the total value of contracts that have been delivered, or are expected to be delivered, from within each geography, assuming the current supply chain; and
 - **High case** - the total value of contracts that could be secured by firms based in Scotland (and the Study Area) with a stronger supply chain. This assumes that some Scottish-based firms that are 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.
28. Section 7: Project Description presents the Rochdale Envelope parameters for the Project based on a range of turbine types, substructures etc. There is no discernible difference in the Project expenditure between these options and hence the economic assessment presented throughout this Section addresses the likely significant effects arising from the Project options. In the case of tourism effects, this assessment is based on the findings of other assessments such as SLVIA (Section 14), Marine Mammals (Section 12) and Shipping and Navigation (Section 18). Each of these assessments has defined the applicable worst case within the relevant Section.
29. The proportions of expenditure, particularly under the high case, are subject to a high degree of uncertainty. However, the Low Case and the High Case have been assessed as the realistic parameters within which the value of contracts will fall. The expenditure for each of the sub-phases was allocated to each geographical area under the two scenarios, and in each appropriate year.
30. In order to estimate the GVA associated with each sub-phase, a ratio of turnover to GVA has been applied to the relevant expenditure values. The Scottish

Government 2007 Input Output Tables (Scottish Government, 2010) have been used to produce ratios for different Industry Groups. Each of the sub-phases of the development has been mapped to an appropriate industry group. The analysis then uses the appropriate ratio to determine the value of GVA that will be generated from the expenditure made for each sub-phase.

31. It is important to acknowledge that the mapping is a 'best fit' exercise because offshore wind activities do not conform readily to these industry groups. The fit between wind farm activity and these Industry Groups is shown as part of the Technical Report (Annex 20A).
32. In addition to the direct GVA effects, it is also important to consider the indirect and induced GVA effects that the development investment will generate:
 - Indirect effects – as suppliers increase output to meet the additional demand for their goods and services, there will also be a knock on increase in demand on their own suppliers and so on down the supply chain; and
 - Induced effects – as a result of the direct and indirect effects, household incomes will increase in line with the increased employment created by the development directly and throughout the supply chain. A proportion of this increased income will be re-spent on other goods and services.
33. The Scottish Input-Output tables have been used to identify GVA multipliers for each of the services that will be procured in the Project sub-phases. UK Input-Output tables (ONS, 2005) do not provide GVA multipliers but do provide output multipliers. These output multipliers have been adjusted using the ratio of output multipliers to GVA multipliers from the Scottish tables to give equivalent estimates for the UK. The Study Area multipliers are estimated by adjusting the Scottish values downwards to reflect the smaller geographical area and the more limited supply chain links.

20.24.1 *Present Value of GVA Effects*

34. In order to compare the direct and indirect GVA that occurs in different years, discount rates are applied in line with HM Treasury Guidance (2003). The discount rate is used to take account 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. 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.

20.24.2 *Employment Effects*

35. The employment effects are calculated by applying the 'employment effect' multiplier values, from Scottish Input-Output tables, to the expenditure expected in each year and in each geographical area. Multipliers that best fit each of the types of goods and services associated with the Project sub-phases have been used, except for operations and maintenance and the offshore installation elements, which are likely to require high levels of capital use. The derivation of these estimates is described below.

36. The direct, indirect and induced employment are calculated from the Scottish Input-Output tables and adjusted for the UK and Study Area estimates, as described above.

20243 *Operations and Maintenance (O&M) Employment*

37. The area where it is most difficult to use industry ratios is in operations and maintenance, where much of the expenditure is on the hire or purchase of capital goods (helicopters and vessels) rather than employment. Because of the difficulty categorising this phase, the analysis uses a report produced by Oxford Economics for Vestas Offshore (2010) which provides estimates of direct and indirect operations and maintenance employment per megawatt. Although there may be some economies of scale associated with the size of this development, this is not yet clear and the Vestas report is a useful measure of the employment effects that have occurred elsewhere. The figures adopted in this report are shown in Table 20.3. This assumes that the full proposal of 1,000 MW is developed. A reduction in this would reduce the level of employment.

Table: 20.3 Operations and Maintenance Employment

| | O&M employment per MW | BOWL MW | Total BOWL O&M employment |
|-----------------|-----------------------|-------------|---------------------------|
| Direct | 0.19 | Up to 1,000 | 190 |
| Indirect | 0.16 | Up to 1,000 | 160 |
| Total | - | - | 350 |

Source: Oxford Economics/Vestas (2010)

20244 *Offshore Installation*

38. A large proportion of expenditure on the offshore installation elements requires the hire or ownership of specialist vessels. For this reason the ratio of turnover and GVA to employment is likely to be much higher than for many other phases of the work. To address this, the assessment has used more detailed employment to GVA figures produced by the Office of National Statistics at four digit Standard Industrial Classification (SIC) level (ONS, 2010) The classification used is 'sea and coastal water transport', which includes vessel services for cable laying and heavy lifting and gives a value of £141,000 GVA per employee.

20245 *Significance criteria*

39. The assessment of significance is based on combining the degree of sensitivity of the receptor to changes in the indicator, with the magnitude of the predicted effects (scale and duration).

20246 *Sensitivity to Effects*

40. This criterion considers how sensitive the economy is to changes in the indicator. In this case changes in GVA and employment. This is a qualitative assessment based on the baseline conditions and professional judgement.

20.2.4.7 *Magnitude of Effect*

41. The magnitude of effect is assessed directly through the estimates of the number of jobs and the value of GVA that would be supported by the Wind Farm through its expenditure and requirement for employment, goods and services. The magnitude of effect is assessed by considering the absolute scale of employment and GVA associated with the development, construction, operation and decommissioning of the Wind Farm and its duration. Duration is important for economic effects, particularly employment, because longer term, permanent jobs are likely to be more beneficial than more transient, short term work.
42. There is no specific number or guidance that defines whether the magnitude is negligible, low, medium or high and the conclusion is a professional judgement.

20.2.4.8 *Level of Significance*

43. The significance of an effect can be characterised as positive, negative or neutral. The level of significance is defined by combining the sensitivity and magnitude as shown in Table 20.4.

Table 20.4 Matrix of Significance of Effect

| Sensitivity or Value of Resource or Receptor | Magnitude of Effect | | | |
|--|---------------------|----------|----------|----------|
| | Negligible | Low | Medium | High |
| Low | Negligible | Minor | Minor | Moderate |
| Medium | Negligible | Minor | Moderate | Major |
| High | Negligible | Moderate | Major | Major |

44. Any effects with a moderate or greater significance are deemed to be significant within the terms of the EIA Regulations.

20.2.5 ASSESSING THE EFFECTS ON TOURISM AND RECREATION

45. There are no guidelines for assessing the potential effect of offshore wind farm projects on tourism and recreation. The focus here is on assessing any effects within the Study Area rather than on tourism at a UK or Scottish level. The assessment does not seek to quantify, in financial terms, any effect on local tourism businesses. Instead, the assessment reviews the baseline and literature to draw a conclusion on the significance of the effect of the proposal on tourism and recreational activity. The assessment comprises the following:

- Assess the current profile of tourists and visitors who travel to the Study Area in terms of numbers, spend, activities, reasons for visiting the region etc.;
- Review reports and surveys of how other wind farm developments have effected tourism in other areas of the UK and further afield;
- Identify any direct effects on local tourism 'assets' (e.g. public rights of way, paths, scenic areas or so on) which the new development may cause at the different stages; construction, operation, maintenance and decommissioning;

- Identify indirect effects on local tourism assets. In this case, indirect effects mainly relate to changes in amenity through the permanent or temporary modification of land and seascapes and the visual effect of the installations and associated development. These potential indirect effects are identified by first undertaking an audit of the tourism assets within the area identified as having sight of the Wind Farm;
- Undertake a number of consultations with tourism stakeholders to understand their views and the potential effect it may have on tourism; and
- Consider the potential effects on other recreational activities (surfing, walking and sea kayaking).

2025.1 *Significance Criteria*

46. The assessment of significance is based on combining the degree of sensitivity of the receptor to changes in the indicator, with the magnitude of the predicted effects (scale and duration).

2025.2 *Sensitivity to Effects*

47. This criterion considers how sensitive tourism (the tourism sector and tourists) are to the Wind Farm proposal. This is a judgement based on the profile of the sector and informed by the desk based research and consultation. This is a qualitative assessment based on professional judgement.

2025.3 *Magnitude of Effect*

48. The magnitude of effect is assessed by considering the potential level of effect and the numbers that would potentially be affected. This is determined by the current level of activity and the conclusions of the SLVIA (Section 14). There is no specific number or guidance that defines whether the magnitude is negligible, low, medium or high and the conclusion made is a judgement.

2025.4 *Level of Significance*

49. The significance of an effect can be characterised as positive, negative or neutral. The level of significance is defined by combining the sensitivity and magnitude as shown in Table 20.4.
50. Any variables with a moderate or greater significance are deemed to be significant within the terms of the EIA Regulations.

20.3 BASELINE CONDITIONS

20.3.1 POLICY AND PLANS

51. The Scottish Government's *Low Carbon Economic Strategy* (LCES) for Scotland (2010) forms an integral part of the Government's Economic Strategy (GES) for setting the overarching agenda to support the transition to a low carbon economy. Under the theme of "*supporting business environment*" the GES highlights the need to expand Scotland's areas of international comparative advantage, with particular attention required for building critical mass of activity in a number of sectors including renewables.

52. The LCES identifies the need to exploit commercial opportunities and suggests that offshore wind development alone could generate 28,000 direct jobs, a further 20,000 jobs in related industries and over £7bn investment in Scotland by 2020. The associated opportunities for inward investment are identified as a priority for Scottish Development International (SDI). Specifically, with respect to offshore renewables, the Strategy points out 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 individuals experience and qualifications e.g. skilled individuals with experience in the oil and gas sector working in offshore renewables.
53. The Scottish Government's *Renewables Action Plan* (2009) initiated the development of an investment plan to support appropriate infrastructure for the emerging offshore wind sector. The Scottish Energy Advisory Board (SEAB) set the task through the *National Renewables Infrastructure Plan* (N-RIP) project to develop a Scotland wide proposal. This was led by Scottish Enterprise (SE) and Highlands & Islands Enterprise (HIE) with active engagement of Local Authorities and forms a key element of the Route Map developed by the Offshore Wind Industry Group.
54. N-RIP outlines support 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 the total investment required for all 11 sites identified in N-RIP Stage 1, for offshore wind manufacturing, is £223m. This is expected to create a set of clustered port sites which could support an offshore wind sector. Investment proposals for infrastructure development for offshore renewables will be treated as a 'high priority activity'.
55. The main conclusions from the N-RIP Stage 2 report are as follows:
- There is a 'stock' of sites in Scotland that could potentially meet industry demands. Investment decisions will be led by port owners;
 - The public sector might co-invest with the private sector to finance development projects;
 - Based on offshore Project developer feedback and SDI's enquires, most interest is being shown in sites in the Moray Firth and Forth/Tay cluster. As these sites receive the most interest, they should be the focus for initial investment; and
 - The strategic importance of the development for economic growth ought to be recognised in the next review of the National Planning Framework.

203.1.1 *Highlands & Islands*

56. The HIE Operating Plan 2011-14 (2011) sets out the high level vision of a successful renewable sector with substantial sectoral development, with significant and sustainable economic and community benefits accruing to the Highlands and Islands. Over the period of this plan, key opportunities are expected to come from the on-going commercialisation efforts associated with marine energy, offshore wind developments, further onshore wind deployment, and increased levels of

- micro renewable generation as a result of the Renewable Heat Incentive and Feed-In-Tariff.
57. Major infrastructure investment is expected to occur over the coming years to secure the economic opportunities presented by the offshore renewables industry. The focus of HIE's efforts and resources will also include:
- supporting local supply chain engagement in the sector;
 - attracting inward investment;
 - promotion of the whole area's offer; and
 - supporting local communities to engage with and benefit from the renewable sector.
58. There is to be increased levels of research and development done locally and continuation of representation of the Highlands & Islands interests with national policy makers, particularly in relation to grid regulation.
59. Highland Council has developed a '10 point' action plan for offshore renewable energy development (2011). This identifies a series of specific actions around workforce and skills, infrastructure, supply chain and community benefit. Specifically it commits the Council to continue to support facilities such as the Underwater Training Facility at Fort William. It suggests that the Council should seek to assess O&M requirements of developers and identify locations and campaign for the siting of additional onshore testing facilities within the Highlands. The Council will also campaign for the development of Kishorn and Ardesier within the N-RIP as well as the addition of Scrabster and Nigg and other local harbours. Other actions include working with partners to strengthen the supply chain in the Highlands and with Scottish Development International to attracting related inward investment.

203.12 *Caithness & North Sutherland*

60. The *Highland Wide Local Development Plan* (2010) outlines the overarching spatial planning policy for the whole of the Highland Council area (excluding the area covered by the Cairngorms National Park Local Plan). It essentially sets out the spatial strategy for the area for Caithness and Sutherland in 2030 and says that it aims to "*be a centre of excellence for energy and engineering, have become an international centre of excellence for marine renewables and to be a connected and accessible place*".
61. The draft *Economic Development Strategy/Action Plan* (Westbrook, 2009) produced for the Highland Economic Forum identified priorities that Forum member organisations could help take forward in partnership. The report included a Strengths, Weaknesses, Opportunities and Threats (SWOT) assessment for the Caithness and Sutherland area. It states the following:
- The development of renewable energy through accelerating research and development in wave, tidal, offshore wind energy, community owned onshore wind farms (and other green technologies) and establishing support facilities. It points out that there is a particular "*opportunity in Caithness, with more than 40*

companies having registered interest with the Crown Estate to develop tidal and wave energy in the Pentland Firth and surrounding waters”; and

- The re-establishment of the Nigg yard as a multi-purpose facility that could support offshore and onshore wind power projects, decommissioning of North Sea platforms and wells, and other engineering projects requiring a dry dock, indoor and outdoor fabrication space, and/or sea access.

62. Offshore wind is expected to make a major contribution to the economy of Caithness and North Sutherland in the future. To maximise the benefits from the Wind Farm, the proposition being articulated for Caithness and North Sutherland is expected to emphasise the skills base and logistics capabilities of the area. Key attributes include the following:

- There is an available and developed skilled engineering capability in the supply chain that has built up to support Dounreay and other energy companies;
- There is opportunity to transfer knowledge, skills and experience from other energy sectors such as nuclear and oil and gas, and associated supply chain companies; and
- The area has a geographical advantage in the close proximity of port and harbour facilities on the East Coast of Caithness with the capability of supporting installation and/or operations and maintenance activities.

20.3.1.3 Moray

63. The recently published *Moray Economic Strategy* (Moray Community Planning Partnership, 2011-2015) provides the long term economic diversification strategy for the area. This is in light of the fact that the demography and economy has been heavily influenced by the presence of the two air bases, RAF Kinloss and RAF Lossiemouth. This continues to be the case after recent announcements regarding both bases as part of the UK Government’s Strategic Defence Review.

64. The Strategy recognises that the engineering and fabrication base which at the moment mainly services the oil, gas, and distillation industries lends itself to development and diversification into the renewable energy supply chains. There is also a strong interest in exploiting the opportunities in the Life Science sector, with renewed focus when the £6m Moray Life Science Centre is completed. In terms of towns and cities, Buckie, Forres and Elgin are the main focal points for industrial, engineering and distribution activity, whilst Speyside is seen as the centre for whisky and tourism sectors and Findhorn has a distinctive role in the promotion of sustainable ways of living, arts and cultural activity. The strengths of Moray in terms of development of its key sectors include the following:

- Internationally renowned food & drink brands;
- Natural and industrial tourism assets;
- Building on University status and the completion of the Moray Life Science Centre (development of E-health sector);
- The potential offered by renewable energy and other sectors;
- Established social economy sector;
- High quality of life with access to beautiful landscape; and

- Close relationships between public sector and businesses.
65. The Strategy itself is structured around the ‘drivers’ of competitiveness; People, Business, Infrastructure, Communities and Identity. Long term sustainable growth is expected to involve a strategic approach which encompasses the following:
- Targeting resources to achieve highest return for Moray’s businesses and communities;
 - Taking a medium and long term view of decisions and actions that affect the wider Moray economy;
 - Transforming the physical infrastructure to enhance Moray’s appeal to inward investment and people;
 - Capturing a greater share of growing sectors by some bold investments in new assets and people; and
 - Maximising the resources that can be attracted from national and international sources towards development initiatives in Moray.
66. Prior to the final decisions made as part of the Strategic Defence Review, HIE published the findings of an economic effect assessment of the two RAF bases. This found that the bases collectively support 5,710 full time employment (FTE) jobs in the local economy, this equates to 16% of all FTE employment within Moray. Direct on-site employment was identified as 4,037 FTEs. The gross income from RAF Kinloss and Lossiemouth were estimated at £68.0m and £90.3m respectively (total £158.3m).

20.3.2 SOCIO-ECONOMIC BASELINE DESCRIPTION

67. The Study Area covers the Local Authority boundaries of Highland, Moray, Aberdeenshire and Aberdeen City, encompassing a footprint across the north of Scotland and enveloping the Moray Firth. The study includes the cities of Aberdeen and Inverness with a series of small towns along the Aberdeenshire and Moray coast. The conurbations closest to the Wind Farm Site are on the east Caithness coast and include the towns and villages of Brora (a population of 1,160), Golspie (1,650), Helmsdale (800), Lybster (850) and Wick 7,300). Towns and villages on the north Moray coast are further from the Wind Farm Site more than 50 km. These include Lossiemouth (population of 6,800), Buckie (8,000), Portknockie (1,200) and Portsoy (1,700).
68. The two authorities in the east of the Study Area, Aberdeenshire and Aberdeen are characterised by income above the Scottish average, higher house prices and higher proportions of the population working in oil and gas related jobs. Aberdeenshire in particular has a growing population. Incomes are lower in Highland and Moray, although unemployment rates in all four authorities in the Study Area have tended to be below the Scottish average since 1992. In Aberdeen City, Aberdeenshire and Moray, unemployment has historically been well below the national average. The figures fell steadily between 1993 and 2008, but have increased slightly since then to around 3%.

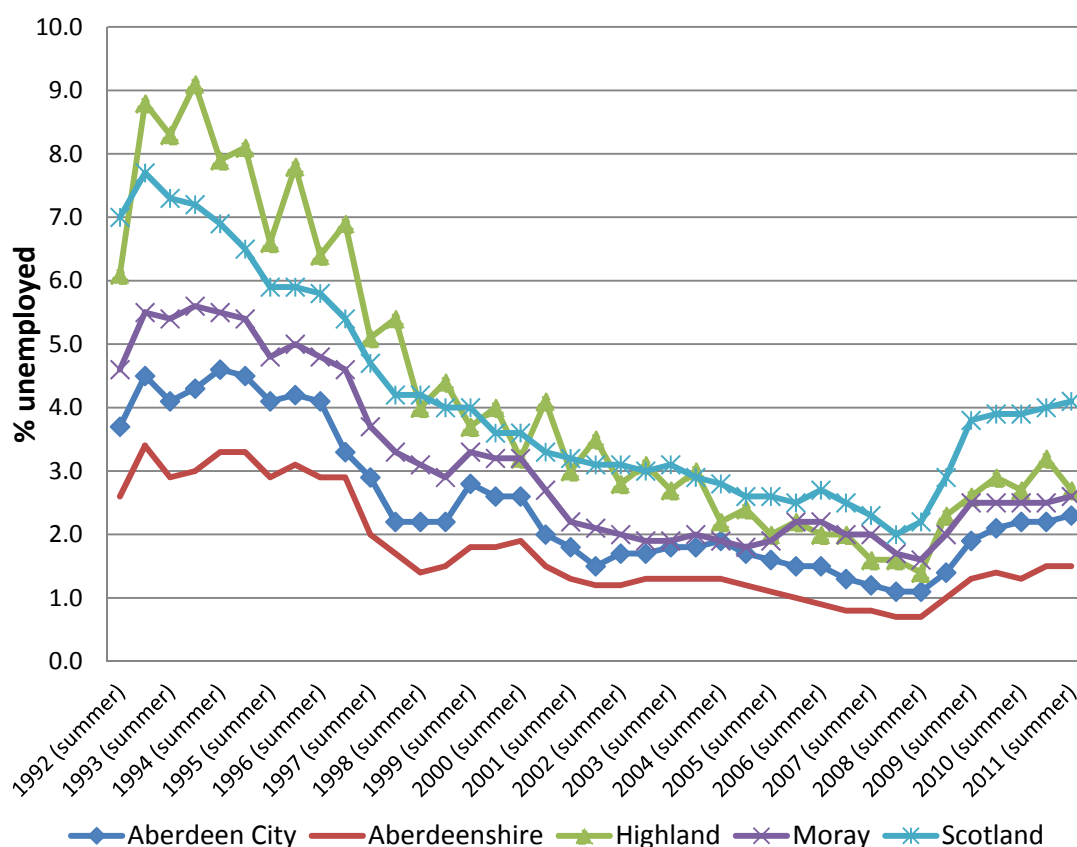
20.3.2.1 Population

69. Within the four Local Authority areas, the total population is estimated to be 772,000. In 2010 the number of working age people (aged 16 to 64) was 507,000, 66% of the population and the same proportion as in Scotland as a whole. Within this, Aberdeen City has a high proportion of working age residents (70%) while in Highland, Moray and Aberdeenshire the figure is slightly below the Scottish average. In these three authorities, the proportion of the population over 65 is slightly higher than the national average, indicating a higher proportion of retired residents.

20.3.2.2 Unemployment

70. Unemployment rates in the Study Area have tended to be below the Scottish average since 1992 (Plate 20.1). The exception is Highland where unemployment was higher in the first half of the 1990s. In Aberdeen City, Aberdeenshire and Moray unemployment has historically been well below the national average. The figures fell steadily between 1993 and 2008, the start of the recession. From then unemployment rose slightly but remains below 3% which is low by most standards. With reductions in public sector budgets and slow economic growth, unemployment has risen over the past three years.

Plate 20.1 Unemployment Rates Within the Study Area

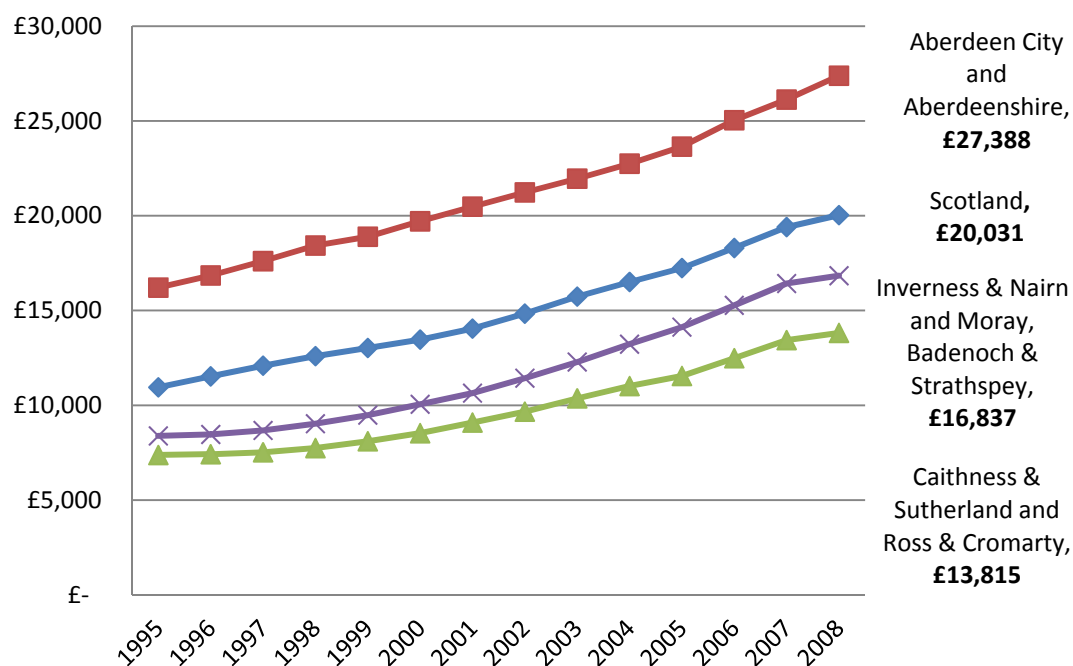


Source: ONS (2011) claimant count with rates and proportions

20.3.2.3 *Gross Value Added (GVA)*

71. There is a significant difference in the GVA generated in Aberdeen and Aberdeenshire and in the more rural Moray and Highland areas. This mostly reflects the very high value added of the oil and gas sector. GVA per head in Caithness and Sutherland and Ross and Cromarty is around half the Aberdeen and Aberdeenshire figure (Plate 20.2).

Plate 20.2 GVA Per Head in the Four Local Authorities in Study Area

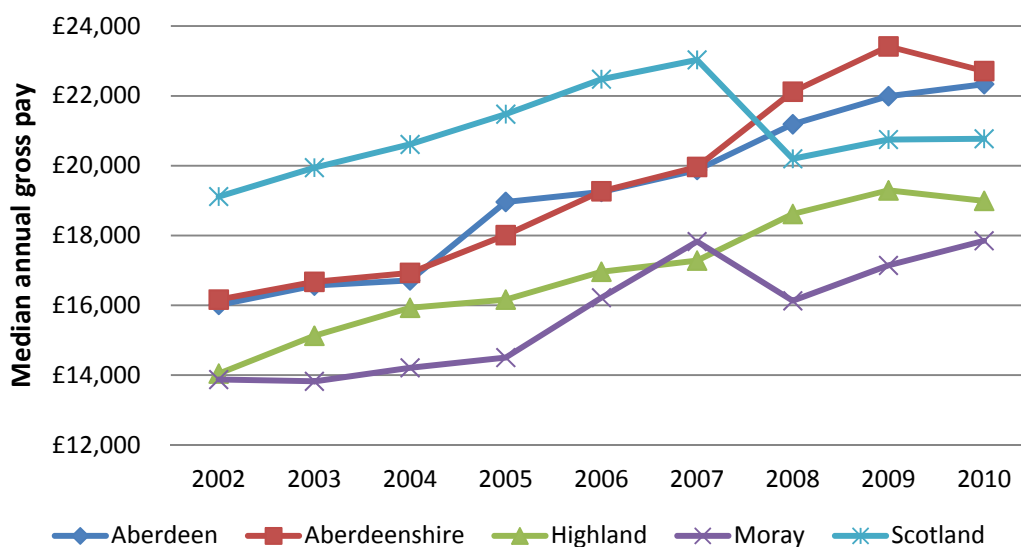


Source: ONS Regional Accounts 2010

20.3.2.4 *Individual Median Earnings*

72. In Scotland the data on earnings shows a relatively steady rise to 2007, but falls significantly in 2008, reflecting the financial crisis, before flattening out in 2009 and 2010. Aberdeen, Aberdeenshire and Highland did not suffer the same decline in 2008, but earnings have flattened out in 2009 and 2010, and in Aberdeen have fallen slightly in 2010. In Moray, earnings dipped in 2008, but have continued to grow again in 2009 and 2010. The strength of the oil and gas sector has been important in maintaining both employment and earnings in the north east.
73. In absolute terms, median earnings in Aberdeen and Aberdeenshire are well above the Scottish median, while Highland and particularly Moray are significantly below. Median earnings in Aberdeenshire are around 25% higher than in Moray (see Plate 20.3).

Plate 20.3 Individual Median Annual Gross Pay 2002 - 2010



Source: Annual Survey of Hours and Earnings - resident analysis

203.25 *House Prices*

74. The pattern of house prices in the Study Area has closely followed the national picture. There were sharp increases in house prices between 2003 and 2008 and peaking before the financial crisis and subsequent recession. Even so, house prices have remained at around 2007 prices. The highest median prices are in Aberdeenshire, from where many relatively high earners can commute to oil and gas related jobs in and around Aberdeen. The median of £185,000 is well above the Scottish national median of £135,000. Prices in Aberdeen City (£150,000) and in Highland (£145,000) are also well above the national figure. Moray, with lower levels of GVA and earnings also has a lower median house price (£128,500).

203.26 *Education*

75. Table 20.5 sets out the highest level qualifications among the working age population, for each of the Local Authorities in the Study Area. Qualifications in Aberdeen City and Aberdeenshire are above the national average, while Highland and Moray are slightly below. All the areas are above the national average for qualifications equivalent to NVQ level 2 and 3 and in all four authorities there are significantly fewer people with no qualifications. Overall, the Study Area has higher proportions of more qualified people than Scotland as a whole and fewer with no qualifications.

Table 20.5 Qualifications Jan 2010 – Dec 2010 by Local Authority area (% of population aged 16-64)

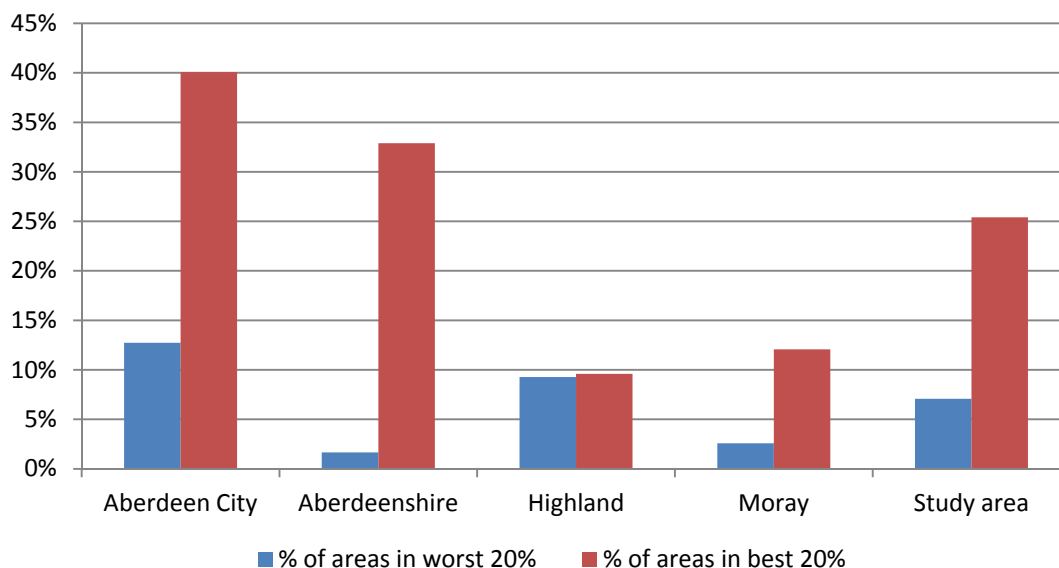
| | Scotland | Moray | Highlands | Aberdeenshire | Aberdeen City |
|--------|----------|-------|-----------|---------------|---------------|
| NVQ 4+ | 35.0 | 29.5 | 33.6 | 37.4 | 43.5 |
| NVQ 3+ | 55.9 | 55.8 | 57.2 | 59.9 | 60.6 |
| NVQ 2+ | 70.2 | 71.1 | 77.0 | 73.4 | 74.3 |
| NVQ 1+ | 80.1 | 83.6 | 86.8 | 84.8 | 83.5 |
| None | 12.3 | 9.5 | 6.6 | 8.1 | 9.1 |

Source: ONS (2011), Annual Population Survey

20.3.2.7 Deprivation

76. The Scottish Household Survey published by the Scottish Government includes questions on how residents rate their area as a place to live. In common with many of the other indicators, Aberdeenshire scores highly in both 2007-08 and 2009-10, well above the Scottish average. The Aberdeen score fell below the Scottish average in 2009-10, while Highland and Moray have both shown very significant improvements in the past few years.
77. One of the key measures of quality of life is captured by the indices of deprivation. Though not directly comparable, each index is based on the concept that dimensions of deprivation such as income, employment, education and health can be identified and measured separately. These dimensions, sometimes referred to as 'domains' are then aggregated to provide an overall measure of multiple deprivation and each individual area is allocated a deprivation rank and score.
78. The Index of Multiple Deprivation (a measure of a range of dimensions of deprivation such as income, employment, education and health) provides another indicator of quality of life and shows the Study Area scoring better than the Scottish average. Plate 20.4 shows 40% of the neighbourhoods in Aberdeen are in the best 20% in Scotland and 12% in the worst 20%. Aberdeenshire follows a similar pattern, while Highland and Moray both have lower proportions in the top and bottom ends of the rankings. All have a higher proportion in the best 20% than in the worst 20%. Overall, there are a small number of neighbourhoods (6% in the Study Area) that are in the lowest 20% in Scotland.

Plate 20.4 *Proportion of Neighbourhoods - Best and Worst 20% in Scottish Index of Multiple Deprivation Rankings by Local Authority*



Source: Scottish Neighbourhood Statistics (2009 rankings)

80. Rankings are also available for each Scottish neighbourhood. Figure 20.2 shows the ranking of each neighbourhood closest to the Wind Farm Site. While most neighbourhoods are relatively highly ranked, particularly in north Moray, the neighbourhoods on the Caithness coast score less well. The neighbourhood around Latheron scores particularly poorly, perhaps because of the distances to services.

20.3.2.8 *Employment*

81. Oil and gas-related employment is important in Aberdeen and to a lesser extent Aberdeenshire. Food and drink production is a major employer in both Moray and Aberdeenshire, while tourism is more important in the Highlands. In Highland and Moray, the proportion of employment in health and education (mostly public sector) employment is above the Scottish average. Although the number of jobs in some sectors, such as fishing and tourism is relatively low, these are important jobs within some of the local towns and villages. Equally several large employers (Dounreay in Highland and the RAF airbases in Moray) are large employers that have been crucial in maintaining levels of employment and economic activity over the past decade.

82. Table 20.6 uses four digit SIC code data to show the key sectors and their importance to the Study Area relative to Scotland. It shows the importance of the oil and gas sectors and engineering, driven by Aberdeen, the food and drink manufacture in Moray and the significance of tourism which is largely in the Highlands.

Table 20.6 Key sectors and their importance to the Study Area relative to Scotland (SIC code (4 digit))

| Industry | Aberdeen City | Aberdeenshire | Highland | Moray | Scotland |
|--|---------------|---------------|----------|--------|-----------|
| Agriculture, forestry & fishing | 100 | 1,100 | 1,000 | 300 | 33,800 |
| Mining, quarrying & utilities (oil and gas production) | 22,400 | 4,400 | 2,400 | 400 | 61,700 |
| Manufacturing | 12,000 | 10,900 | 6,600 | 5,700 | 187,800 |
| Construction | 6,700 | 7,100 | 6,200 | 2,200 | 132,200 |
| Motor trades | 2,400 | 1,600 | 2,300 | 700 | 40,400 |
| Wholesale | 4,900 | 3,200 | 2,600 | 800 | 73,600 |
| Retail | 12,900 | 9,700 | 10,900 | 4,200 | 237,500 |
| Transport & storage (inc postal) | 7,700 | 3,900 | 5,200 | 1,200 | 102,500 |
| Accommodation & food services | 12,200 | 5,800 | 11,600 | 2,500 | 173,400 |
| Information & communication | 3,600 | 1,000 | 2,100 | 300 | 57,000 |
| Financial & insurance | 2,200 | 800 | 1,200 | 500 | 93,500 |
| Property | 1,700 | 600 | 1,000 | 300 | 27,300 |
| Professional, scientific & technical | 23,600 | 7,900 | 4,700 | 900 | 149,000 |
| Business administration & support services | 13,200 | 3,600 | 5,800 | 900 | 177,800 |
| Public administration & defence | 7,900 | 4,200 | 6,200 | 2,400 | 153,000 |
| Education | 10,200 | 7,500 | 9,000 | 3,500 | 195,900 |
| Health | 26,700 | 9,900 | 18,100 | 5,500 | 383,400 |
| Arts, entertainment, recreation & other services | 5,500 | 3,900 | 4,300 | 1,500 | 102,900 |
| Column Total | 175,900 | 87,100 | 101,400 | 33,700 | 2,382,500 |

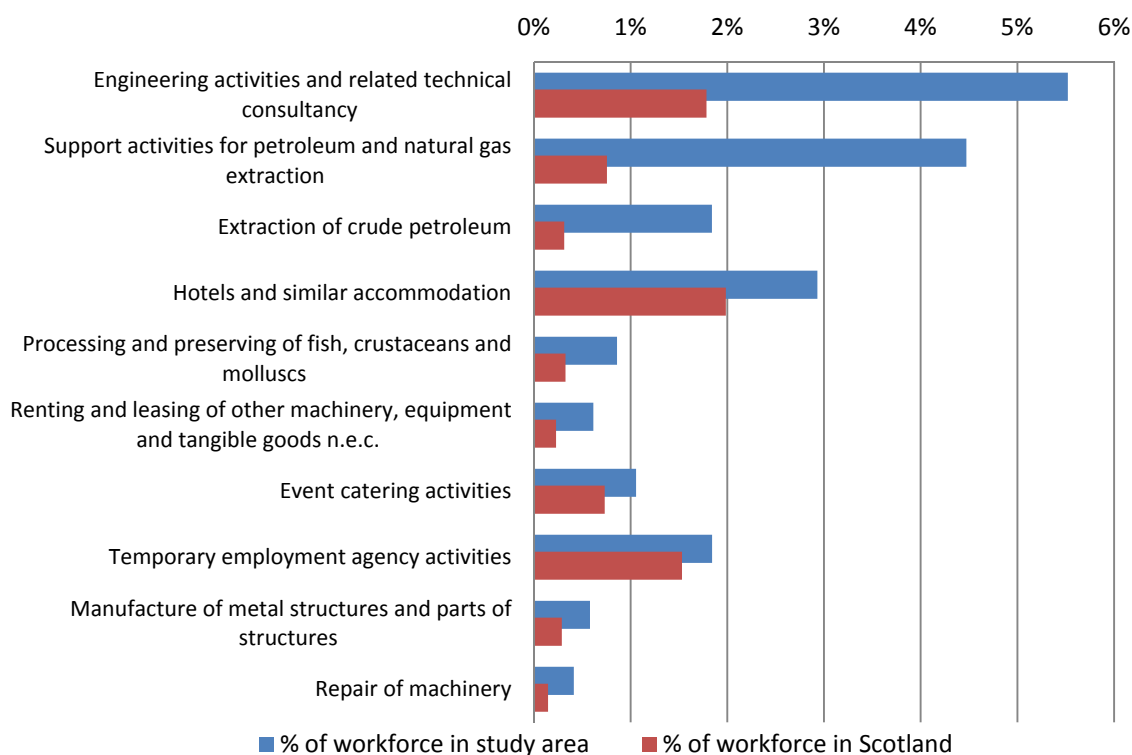
Source: ONS Business Register and Employment Survey (2009)

83. The Study Area is home to 72% of Scotland's businesses in the mining and quarrying and oil and gas extraction. The other areas of strength, relative to Scotland, are agriculture, forestry and fishing (34% of Scottish businesses) and electricity, water and gas sectors (32%).
84. In Moray, manufacturing, which includes food processing, is a major employer and in Highland accommodation and food services, which includes most tourism activity employs 11,600 people. Professional, scientific & technical services are also major employers in Aberdeen, most of which supports the oil and gas sector.

Health and education are other important industries in all four authorities as it is across Scotland.

85. The analysis further highlights the relative strengths in engineering, oil and gas extraction and support activities for the oil and gas industry. This is largely based in and around Aberdeen. The data identifies around 40,000 people working in these areas (a fifth of the workforce) in Aberdeen city. There is a similar pattern in Aberdeenshire with a high proportion of employment in engineering and oil and gas support.
86. The structure of employment in Highland and Moray is quite different from Aberdeen. In Highland there is a high proportion of hotel employment, health and hospital activity and the hazardous waste treatment at Dounreay.
87. In Moray the dominant activities are in food manufacture, distilling, primary education and defence employment.
88. Plate 20.5 shows the sectors in which the Study Area is over represented relative to the Scottish economy. For example, more than 5% of employment in the Study Area is in Engineering and Technical consultancy compared with less than 2% nationally.

Plate 20.5 Key Sectors in the Study Area Relative to Scotland



Source: ONS Business Register and Employment Survey (2009)

89. In addition to the baseline analysis at the local authority level, Figure 20.3 presents a number of indicators within a more immediate area of 40 km using data zone geographies. Where the 40 km boundary cuts across a data zone, the analysis uses a proportion of the data zone values, taking into account the location of towns and

villages. The Figure shows that there are an estimated 13,298 persons within 40 km of the Wind Farm Site and just over 7,000 dwellings.

20.3.3 SUPPLY CHAIN

90. Scottish firms are generally well positioned in relation to securing work from the Project consenting, design and development phases, and have been successful in providing support services, especially in the area of environmental assessment and planning advice (AEA, 2010).
91. There are more gaps in some areas of manufacturing. Scottish Enterprise (Briefing paper to SQW; September 2011) identifies the most significant as being in turbine and cable manufacture. Turbines are the single most expensive element of the Wind Farm and the market is dominated by the large German, Danish, Spanish and US 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. This can make it difficult to break into established supply chains.
92. Scottish Development International is working to try and secure inward investment in turbine manufacturing in Scotland. This will take time to establish the production facilities and then to demonstrate to the market that the turbines are reliable. The SE report *Energy Industry Market Forecast, Renewable Energy 2009-2014* 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.
93. For the installation and assembly phases, Scottish-based firms appear well placed given the strong engineering base and oil and gas experience in the North Sea, however, the availability of suitable vessels and logistics could be a constraint. One of the largest interventions to support the supply chain has been the projects identified in the National Renewables Infrastructure Plan. This is supported by the £70m National Renewable Infrastructure Fund (N-RIF) within the SE area and with a commitment of support for specific investments in the Highlands and Islands by HIE. For the Moray Firth, the potential development of port facilities at Nigg and Ardersier would benefit from these funds. Decisions on the use of specific ports are yet to be made by developers but will have a substantial effect on the economic and employment benefits for Scotland and the Study Area.
94. The O&M phase lasts over the lifetime of the Project and consequently the investment and jobs is longer term than construction or installation. Cumulatively, this can represent a third to a half of the full investment. It is likely that much of this will be delivered from within the Study Area, possibly subcontracted through the turbine manufacturer who would be responsible for maintenance over a warranty period. Whatever arrangement is adopted it is likely to require significant local employment and provide opportunities for Scottish companies. Experience of managing offshore operations in the North Sea will also be an advantage.

95. For decommissioning, the strength of the supply chain is uncertain. The Low and High scenarios assume that the proportion of expenditure made and employment supported in Scotland ranges from 45% to 55%.

20.3.3.1 *Supply Chain Developments*

96. A major influence on supply relationships is the formation of alliances. SSE has entered into an Alliance Agreement with Siemens Wind Power, Siemens Transmission and Distribution, Subsea 7, Burntisland Fabrications (BiFab, 15% owned by SSE) and Atkins, under which the companies will form an alliance to collaborate on SSE's offshore wind programme.
97. This provides the members with more security in planning their work and in managing large contracts. It also allows suppliers to contribute to the design and development of the Project. It is expected that these suppliers would provide some of the major elements of the Project. For BOWL this means that Siemens Wind would manufacture the turbines; Siemens T&D, the Electrical Systems; BiFab/Atkins the substructures and Subsea 7 would manage the construction and logistics.
98. The 2020 *Route Map for Renewable Energy in Scotland* (Scottish Government, 2011) describes some of the developments in the past year including announcements from Doosan Power Systems which expects its offshore wind plans in Scotland to create up to 1,700 new jobs. Gamesa which recently announced major investment in Edinburgh, Mitsubishi Power Systems Europe Ltd and Wind Towers (Scotland) Ltd – a joint venture between SSE and Marsh to take over the tower manufacturing facility at Machrihanish. There is also diversification, with the most notable examples being BiFab, based at Methil, Burntisland and Arnish, producing jacket substructures; Isleburn Ltd, part of the Global Energy Group, part of the team assembling the Beatrice Demonstrator offshore wind prototype and manufacturing a range of full scale wave and tidal technology prototypes, while Technip and Subsea 7 have established renewable divisions in Aberdeen.
99. SE and HIE have undertaken a number of other initiatives to support the supply chain. In addition to the work of SDI in seeking inward investment in turbine and cable manufacturer, and the support made available through the N-RIF, both agencies are developing supply chain databases to better understand where the gaps are and to promote the opportunities from offshore wind and other renewables. SE has launched the Offshore Wind Expert Help programme and Offshore Wind Manufacturing Audits as well as a number of awareness raising events.
100. Scottish Government, HIE, SE, The Crown Estate, MS and others have together developed an information portal (launched at the All Energy Conference 2011) which brings together the offshore wind market background and information, the main interested parties and links to sources of information.

20.3.3.2 Skills

101. A related and important part of the effectiveness of the supply chain in Scotland will be the availability of people with the right skills. The jobs created will require a range of skills across the different phases of development, from environmental consultants, engineers, planners, welders, divers, technicians and vessel crew. There are significant overlaps with the oil and gas industry.
102. An action plan for energy has been developed by Skills Development Scotland, the *Skills Investment Plan for the Energy Sector* (2011). This 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 estimates that there are around 8,000 undergraduates in related subject areas along with 3,000 postgraduates, while Scotland's Colleges support around 25,000 to 30,000 learners in relevant subjects and there are about 3,000 new apprenticeship starts each year in engineering and energy related jobs.
103. Other activities to support skills includes 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.
104. Meeting the additional demand of the new offshore projects will be achieved through a mixture of new employees to the labour market, transferring from other lines of work and retraining and others moving to Scotland. Given the duration of these projects and the long term opportunities, it will also be important to promote the sector with school children to ensure a future pipeline of skills. Within the Study Area there are opportunities to make use of the relevant skills associated with the oil and gas industry, but growth in that sector, combined with the potential employment around further expansion as well as decommissioning is likely to have an effect on demand and wage rates.
105. We understand from HIE that there are people with relevant skills who would return to the Highlands if the right jobs were available. The gradual decommissioning of Dounreay and the change of status of RAF Kinloss could also create a valuable pool of labour for the Wind Farm contractors. Interviews for case studies as part of *Maximising employment and skills in the offshore wind supply chain* (SQW, 2011) for the UK Commission for Employment and Skills reported that ex-military personnel often have the characteristics to cope with long periods of time in difficult working conditions (e.g. rough weather and limited facilities).

20.3.4 TOURISM

106. Tourism is an important part of the Scottish economy. Scottish Enterprise estimates that the tourism sector generates £4.4 billion GVA and employs over 200,000 people in around 20,000 tourism related businesses across the country. Despite difficult economic conditions and significant international competition, the industry has

- proved resilient and is playing an important role in supporting the economic recovery.
107. There are several factors that differentiate tourism from other industries and which make it particularly important in relation to wind farm developments. The first is that it is often disproportionately important in rural and more remote parts of the country. It is one of a few industries that helps retain population and income in these areas. The second is that the scenery and landscapes are critical in attracting visitors.
108. Its importance to Scotland means that the tourism sector is one of a number of priority industries identified by the Scottish Government, SE and HIE. The national tourism aims are set out in *A Framework for Growth* which targets real expenditure growth of 50% between 2005 and 2015.
109. In the Study Area, the baseline employment data indicates that tourism is of greater importance in Moray and Highland, where the hotel and restaurant sectors comprise a higher proportion of the businesses and employment. Each of the areas has its own characteristics, but the coast is a major part of the tourism offer.
110. Tourist activity is proportionately more important in Highland than in the three other Local Authority Areas covered by the study. The baseline suggests that 11% of employment is in accommodation and food services in Highland compared with 7% in the rest of Scotland. Highland Council reports that over 14,000 people are employed in Highland tourism (13% of the workforce) and this figure rises to an estimated 18,400 (17% of the workforce) when the tourism related self-employed are included (Highland Council Planning and Development Service Policy & Information Briefing Note No. 47, May 2011). Tourism in Moray, Aberdeenshire and Aberdeen City is proportionately a less important part of the economy.

203.4.1 *Tourism Characteristics of the Immediate Study Area*

111. The following descriptions are adapted from the VisitScotland website. East of Inverness and Nairn, Moray includes the coastline east toward Buckie. The significant settlements include Lossiemouth on the coast, and towns such as Forres, Elgin and Keith inland. Although not a strong tourist destination the area is home to wildlife, such as ospreys, otters, crested tits, red squirrels, pine martens and bottlenose dolphins. Culbin Forest stands on one of the largest sand dune systems in Britain, and Culbin Bar the best example of a shingle spit. The area is best known for the whisky distilleries that form part of the Speyside Whisky Trail, such as Dallas Dhu at Forres, Glen Moray at Elgin and Strathisla at Keith.
112. The east Caithness coast is the closest land to the proposed Wind Farm Site. This stretches from Dornoch, north to Wick with coastal towns and villages linked by the A9. Brora is a small town on the coast, a base for a number of golf courses in the area and for touring Caithness and Sutherland. Three miles south is a preserved Iron Age broch, Carn Liath. The Clynelish Distillery is a mile further north. Golspie is ten miles north of Dornoch, the village has a long sandy beach and there are a number of scenic walks. There are a number of historic buildings, including St Andrews church and Dunrobin Castle and gardens, one of the grandest houses

in the north of Scotland. Above the village is a 100 foot tall statue of the first Duke of Sutherland. The village has a golf course, bowling club, tennis courts and a swimming pool with fitness facilities. There are facilities for loch and sea angling. The village also has the Highland Wildcat mountain bike trails and a good range of local services including accommodation. Helmsdale is another fishing village and the Timespan Heritage Centre uses a combination of life-size displays and hi-tech exhibits to tell the story of the area. Nearby are Baille an Or and Suisgill - sites of the 'great Sutherland gold rush' of 1869.

113. The village of Dunbeath is on the A9 coast road, between Helmsdale and Lybster. Although not open to the public, Dunbeath Castle is on the cliff top on the opposite side of the bay and there is also a Dunbeath Heritage Centre. Lybster was established at the height of the 19th century herring boom. There is a Water Lines Heritage Centre at the harbour. The Grey Cairns of Camster are seven miles north of Lybster. There are more ancient remains at East Clyth, two miles north of Lybster.
114. John O' Groats, the most northerly place on mainland Britain is undergoing a substantial redevelopment. Wick is the principal town in the far north of the mainland and once a major herring port and its story is told in the Wick Heritage Centre. There are the 15th to 17th century ruins of Sinclair and Girnigoe castles on a thin promontory three miles north of the town and cliff top walks to the castles via Noss Head lighthouse from the village of Staxigoe.
115. Thurso on the north coast is the most northerly town on the British mainland. Its visitor attractions include the Swanson Gallery and the glass blowing studio, Glass Creations. It is also popular with surfers. West of Thurso is Dounreay nuclear power station, which has a visitor centre.

20.3.4.2 *Visitor Profile*

116. The closest point to the proposed Wind Farm Site, and the point at which the turbines will be most visible, is the east Caithness coast from Helmsdale, north to John O' Groats. A detailed review of tourism in Caithness and Sutherland has been prepared by Tourism Resource Consultants (TRC) (2011). The report provides information on the profile of tourists staying in the area. Around a third are Scottish residents, 41% are from the rest of the UK with 26% are from overseas (Table 20.7). While business tourism in relation to the decommissioning of Dounreay is an important part of the market around Thurso, it is less so on the east coast. This part of the coast tends to be a route for visitors travelling north rather than a destination in itself (VisitScotland consultation).

Table 20.7 Origin of visitors to Caithness and Sutherland

| Category | Scottish | Rest of UK | Europe | American | Other | Total |
|------------------------------|----------|------------|--------|----------|-------|-------|
| Hotel | 36% | 45% | 14% | 3% | 2% | 100% |
| B&B/Guest House | 26% | 32% | 32% | 6% | 4% | 100% |
| Total Serviced Accommodation | 33% | 41% | 19% | 4% | 3% | 100% |

Source: Tourism resource Consultants (2011) Ambitions for Tourism Caithness and North Sutherland, Highlands and Islands Enterprise

117. Room occupancy data can be used to estimate the number of staying visitors and the value of tourism within the local economy. The TRC report provides room occupancy averages reported in 2009 and compares them with the national average values. The results indicate room occupancy of 58% which allows us to estimate the value of tourism within the areas closest to the Wind Farm.

20.3.4.3 *Tourism in the Zone of Theoretical Visibility*

118. In order to assess the potential effect of the Wind Farm on the local tourism industry, the tourism accommodation that lies within 40 km of the proposed Wind Farm Site has been identified. The 40 km distance is identified in the SLVIA (Section 14) as covering all the potentially significant seascape, landscape and visual effects.

119. A map has been used to estimate the number of establishments, rooms and sleeping spaces within 40 km from the Wind Farm Site, however, not all of these establishments will be within view of the Wind Farm (Figure 20.4). Figure 20.4 shows that within 40 km there are 57 establishments, with 294 rooms and a capacity for 600 sleepers.

120. Bed occupancy (as opposed to room occupancy) is typically around 40%² and the average tourist expenditure in the Highlands is £53.50 per night (VisitScotland, 2009). On this basis the expenditure of visitors that stay within 40 km is around £4.7 million.

20.3.4.4 *New Tourism Accommodation Developments*

121. The TRC report notes that “discussions with the planning authorities and others suggest very few new developments are in the planning process and when these are in evidence it is mainly for modest scale additions/changes to the accommodation stock. The exception is the major redevelopment of John O’Groats that will include refurbishment of the current semi-derelict hotel and new build to provide a mix of 42 new self-catering units of different sizes.”

20.3.4.5 *Dolphins*

122. For tourism the population of bottlenose dolphins is particularly well known and associated with the Inner Moray Firth. In 2010, The Moray Firth Partnership

² TRC (2011) indicates 58% room occupancy. Assuming 1.5 bed spaces per room gives 40% bed occupancy.

commissioned Aberdeen Centre for Environmental Sustainability (ACES) to undertake a study to Value the Tourism Expenditure related to the East of Scotland Bottlenose Dolphin Population. The study summarises the key tourism aspects as:

“The areas where the bottlenose dolphin population is particularly well known and attractions are most highly developed are around the Inner Moray Firth, where there is a combination of frequent local boat trips promoting dolphin viewing over the tourist season, together with the most famous land-based dolphin watching site at Chanonry Point (near Fortrose).

Other areas around the Moray Firth are also promoted as offering good viewing locations by a variety of tourist providers and information services, including the locations of Cromarty, Fort George, Nairn, Lossiemouth, Spey Bay, and Cullen. The Whale and Dolphin Conservation Society (WDCS) has developed a large, free-entry centre at Spey Bay, and recently opened a smaller seasonal visitor centre at North Kessock (near Inverness). These sites also promote a variety of coastal and marine wildlife, but are recognised as particular centres of knowledge and information on the dolphin population and its movements. A further 5 individual boat operators run marine wildlife trips around the outer Moray Firth, and dolphins are recognised as one possible species that may be seen in these locations. However wildlife tour boat operators are typically very concerned to emphasise that they do not promote wildlife trips based on dolphins, but rather advertise marine and coastal wildlife more broadly, particularly seals and seabirds.”

123. The study estimates that there are around 63,000 overnight visitors passing through the four main dolphin watching locations around the Moray Firth. It also estimates that the total direct expenditures related to the bottlenose dolphin population was at least £10.4m, but around a third of this would potentially be spent elsewhere in Scotland even in the absence of opportunities to see these dolphins. On an indicative estimate adjusting for additionality, the total income from direct tourism expenditure in Scotland reliant solely on the presence of the east of Scotland bottlenose dolphin population was considered to be at least £4m supporting approximately 202 Full Time Equivalent (FTE) jobs including multiplier effects.
124. The study found 33% considered seeing dolphins as the main reason for their visit. Estimates were based on a 526 person survey of visitors to recognised dolphin viewing locations and centres around principally the Moray Firth. The bulk of dolphin tourist expenditure is received by general tourist providers around the Moray Firth region, particularly Highland (61%) and Moray (14%).
125. The Marine Mammals Assessment shows that the dolphins themselves spend most time close to the shore. Seals and porpoises are also common and Minke whales can be seen, particularly East of Spey Bay and towards the outer Moray Firth.

20.3.4.6 Other recreation

Surfing and sea-kayaking

126. There are three surfing sites on the east Caithness coast, north of Wick at Keiss, Ackergill and Sinclair’s Bay. There are also a number of sites on the Moray coast, although these are beyond 50 km from the Wind Farm Site. A MS (2011) report

stated that surfing is popular on the south side of the Moray Firth but rarely undertaken around the vicinity of the proposed Beatrice array in beaches along the northern Moray Firth (Surfers Against Sewage (SAS), 2010).

127. There is little information on the extent of sea kayaking, but the Caithness Kayak Club organises sea kayaking from a number of places including Ackergill during the summer.

Walking

128. There are no indicators of the number of walkers visiting the coast closest to the Wind Farm; although the main paths are identified in the SLVIA (see Section 14). Whilst there are no national long distance routes for walkers within the Study Area, locally important routes include coastal paths around Lybster and the sign-posted route to the viewing point at Duncansby Head.
129. The study area also contains a number of regionally designated Heritage Paths along the coastline which have been created to link objects and sites of the region's industry and cultural heritage.

Other Attractions

130. There are a number of other features and attractions that provide recreation facilities closest to the Wind Farm Site, as summarised in Table 20.8. The majority of recreation facilities and attractions on the east Caithness coast are found around Wick, with fewer along the coast down to Helmsdale north.

Table 20.8 Recreation Facilities and Attractions closest to the proposed Wind Farm Site

| | | | |
|---------------------------------------|--|--|---------------------------|
| Ackergill Links Beach | Clan Gunn Museum/ Heritage Centre | Last House Museum | Shelligoe Archery |
| Badbea (Highland Clearance Village) | Dunbeath Estate (Gardens) | Lybster Golf Club | St Fergus Gallery |
| Borgie Forest | Dunbeath Heritage Centre | Lyth Arts Centre | Thrumster Estate |
| Bunillidh Thistle Sports Club | Duncansby Head Lighthouse & Stacks | Lyth Stables | Timespan Heritage Centre |
| Cairn O'Get | Hee-Haw Donkeys | Munsary Peatlands Reserve | Waterlines Visitor Centre |
| Caithness Broch Centre | Hill O' Many Stanes | North Lands Creative Glass | Whaligoe Steps |
| Caithness Heritage Trust (Waterlines) | John O'Groats Ferries - Wildlife Cruises | North Shore Pottery | Wick Golf Club |
| Caithness Kayak Club | Katrina Sutherland Country Spa | Old Castle of Wick (Historic Scotland) | Wick Heritage Centre |
| Caithness Seacoast Ltd, Sea Tours | Keiss Beach/ Castle | Old Pulteney Distillery Visitor Centre | Wick Swimming Pool |
| Castle Sinclair | Laidhay Croft Museum | Ousdale Broch | Yarrows Broch |

Source; TRC (2011) Ambitious For Tourism Caithness and North Sutherland

20.34.7 *Evidence of the Visual Effects of Wind Farms on Tourism*

The Economic Effects of Wind Farms on Scottish Tourism: A Report for the Scottish Government

131. The most relevant research carried out to date is a study for the Scottish Government (Glasgow Caledonian University, 2008). Although this is based on onshore wind farms, there are useful findings in understanding how the presence of wind farms can effect on visitor decisions. The work included a literature review as well as a survey of 390 visitors.
132. From the survey, the study concluded that *“the results confirm that a significant minority (20% to 30%) of tourists preferred landscapes without wind farms. However of these only a very small group were so offended that they changed their intentions about revisiting Scotland”*.
133. However the survey also provides some evidence of the scale of changes on behaviour that might be expected. The key element is whether visitors’ preferences for landscapes without wind farms translates into a reduced likelihood to visit in the future, which in turn would reduce tourist numbers and expenditure.
134. The survey found that the vast majority (99%) of those 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. Under the worst case, visitors, on average, indicated that they would be 2.5% less likely to return.
135. 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 concluded that *“Overall there is no evidence to suggest a serious negative economic effect of wind farms on tourists”*.
136. It also found a diminishing marginal loss of value associated with increasing the size of wind farms; *“Once there has been an intrusion into the scenery, the effect on the value of the landscape of expanding the size of the Wind Farm is relatively small”*.
137. In terms of the ‘views of respondents by main tourist activity’, the report found that walkers are less opposed to wind farms than the norm; *“There is, however, evidence that - on balance - individuals (tourists or otherwise) place a higher value on the landscape when a wind farm is not included in the view than when it is. This does not mean that this will necessarily influence a tourist's decision to visit that location.”*
138. The report concluded that; *“over time, hostility to wind farms appears to lessen and they become an accepted even valued part of the scenery, particularly by those closest to them. In some countries an established wind farm appears to be able to act as a tourist attraction in the same way as a hydro-electric power station. Overall, there does not appear to be any robust evidence to suggest a serious negative economic effect of wind farms on tourism.”*
- North Hoyle Offshore Wind Farm – 2nd Public Attitude Survey*
139. RBA Research was commissioned by RWE Npower Renewables to conduct a survey to gauge the opinions of residents and visitors in the Rhyl and Prestatyn areas towards the North Hoyle Offshore Wind Farm in 2004 (Written evidence to Select Committee on Innovation, Universities, Science and Skills written Evidence, June 2008). The research aimed to establish:

- Awareness and knowledge of North Hoyle;
 - Opinions about the Wind Farm;
 - The importance of the sea view; and
 - The Wind Farm's effect on visitor numbers and the degree and nature of people's environmental concerns.
140. A similar survey had been carried out by RBA in March 2003, before the wind farm was constructed, and this provided a baseline. Face to face interviews were carried out with a representative cross section of the residents, 100 in Prestatyn and 100 in Rhyl. Visitor interviews were also conducted in both Prestatyn and Rhyl (56 in total). Interviews took place between 1st and 16th June 2004.
141. Support for the North Hoyle Offshore Wind Farm has increased with 73% of residents now saying they support the project, compared with 62% of residents before the Wind Farm was operational. Five residents opposed the Wind Farm. A total of 71% of visitors say they are in support of North Hoyle and none of the 56 visitors interviewed said they opposed the wind farm.
142. Two thirds of residents (67%) say 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 be saying there has been an increase rather than a decrease in numbers (11% compared with 4% who say decrease).
- Other Examples of Visual Effects of Wind Farms on Tourism*
143. Scroby Sands Offshore Wind Farm, located off the coast of Great Yarmouth in Norfolk, has its own seafront visitor centre, which has welcomed some 30,000 people through its doors in its first 6 months of operation. The Greater Yarmouth Tourism emphasises the wind farm in its material and web site, saying that the 30 turbine wind farm on Scroby Sands, 3 km off the coast has become a popular landmark and tourist attraction.
144. A US report, Wind Turbines and Coastal Recreation Demand (2011) examined the effect of coastal wind turbines on tourism and recreation in North Carolina. The study was funded by the Appalachian State University Energy Center and used travel cost models and revealed and stated preference methods in order to measure the effect of coastal wind farms on the economic value of beach visitation.
145. A combination of telephone and web survey data were used to assess the effect of coastal wind farms on trip behaviour and site choice for a sample of North Carolina coastal tourists. Overall, it found very little effect of coastal wind turbines on aggregate recreational visitation of residents in the northern coastal counties of North Carolina. Although the research found that beach visitors from the northern counties in North Carolina were 'aversive' to offshore wind farms in close proximity to the beach, for those further out (defined by the study as four miles) it did not find a statistically significant effect.
146. An overview of reports carried out in the US by Grand Valley State University (Nordman, 2011) in May 2011 summarised its findings in relation to tourism as; *"Tourism is a crucial part of many coastal economies, but there is no evidence that existing*

offshore wind farms in Europe support or hinder tourism. Surveys show some tourists may avoid beaches with a view of an offshore wind farm, while other tourists might seek them out."

147. Research carried out by researchers at the University of the West of England (UWE) in 2004 examined the potential effect of wind farm development in North Devon on tourism. A total of 379 day visitors and tourists were interviewed face-to-face. The vast majority of tourists surveyed in North Devon (87%) stated 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 effect on the quality of their experience.
148. The BWEA (2006) prepared a response to the All-Party Parliamentary Group on Tourism which suggested that the judgment of acceptability based on landscape protection will provide ample safeguard for the protection of tourism.
149. Research for Scottish and Southern Energy (2007) Tourism Impact of the Artfield Fell Wind Farm in Dumfries and Galloway found that 83% of respondents considered that the Wind Farm had no effect on tourism, 3% of respondents believed the Wind Farm to have had a negative effect and 14% did not know.

20.4 ASSESSMENT OF POTENTIAL EFFECTS

20.4.1 GVA EFFECT

150. This Section uses the information provided in the baseline Section (20.3), the methodology (20.2) and investment expenditure information supplied by BOWL to assess the GVA and employment that would be supported.
151. Although it is not appropriate to reveal details of the exact planned expenditure on the Wind Farm, it is useful to provide some indication of the scale of the investment. The capital expenditure costs of developing and constructing an offshore wind farm are estimated to be around £3m per MW (Renewable UK, 2011). The proposed Wind Farm would generate up to 1,000 MW, giving an indicative capital investment of around £3bn.
152. The analysis in the baseline description of the supply chain is reflected in the pattern of expenditure anticipated by BOWL. The expenditure that the developer considers likely to be made in Scotland, under the low case, closely matches the analysis of the Scottish supply chain which has higher proportions of the investment retained in Scotland from activities in the development and consenting phases, construction/installation, and in the operations and maintenance, but with less manufacturing expenditure retained. Under the high case the supply chain is stronger and the potential for greater retention both locally and in Scotland.
153. The SSE Alliance Agreement makes these estimates more robust, and this is reflected in narrower ranges between the low and high cases than might otherwise be the case.
154. The pattern of anticipated expenditure is summarised below:

- The estimates assume a relatively high proportion of expenditure retained in Scotland in the development and consenting phase, some of which has already been made or contracted. Retention of expenditure in Scotland during this phase is expected to range from 35% to 50%;
- The low case assumes a relatively low retention of manufacturing spend in Scotland, reflecting the current supply chain gaps in turbines and cables, but in the high case includes successful Scottish suppliers of a number of important components. The retention in Scotland is expected to range from 15% to 25%;
- There is a relatively wide range in retention of expenditure in relation to construction & installation which reflects procurement and design decisions that are still to be made. This includes the methods and location of assembly. The retention in Scotland is expected to range from a low of 20% up to 60%;
- Operations and maintenance includes personnel, marine vessels and helicopters and engineering services. The level of retention in Scotland would be expected to be relatively high, ranging from around 30% to 60%; and
- The proportion of expenditure on decommissioning retained in Scotland estimated by BOWL, ranges from 45% to 55%.

155. As a sense check the data provided has been compared with the estimates used in the IPA/Scottish Renewables Report (2010). The figures provided by BOWL and the Alliance Agreement members have been rounded to the nearest 10% to protect commercial confidentiality. Overall they suggest that estimates in the low case are slightly higher than the low case figures produced by IPA. For some sub-phases the Agreement means that the estimates of the proportion of expenditure retained in Scotland, even under the Low case, are higher than was the case in the IPA work. There is no comparison for the decommissioning figures.

156. Table 20.9 shows that the overall proportion of the budget BOWL anticipates spending in Scotland is 30% under the low case and 50% under the high case.

Table 20.9 Comparison of Retention Factors Estimated by Developers with IPA/Scottish Renewables Study (2010)

| Project phases | IPA (High cases A & B) | BOWL (High case) | IPA (Low cases C & D) | BOWL (Low case) |
|--|------------------------|------------------|-----------------------|-----------------|
| Consenting & Development | 50% | 50% | 20% | 30% |
| Construction & Commissioning | 31% | 30% | 7% | 20% |
| Operational | 45% | 60% | 33% | 30% |
| Overall proportion of budget in Scotland | | 50% | | 30% |

Source: As show IPA/Scottish renewables (2010) Scottish Offshore Wind: Creating an Industry

157. Table 20.10 provides a summary of the GVA effects for the Study Area, Scotland (including the Study Area) and the rest of the UK. For the Study Area, it is estimated that the expenditure made by the proposed Wind Farm will generate between £225m and £455m in GVA over its lifetime, including the indirect effects.

158. In Scotland, including the Study Area, the expenditure made by the proposed Wind Farm would generate GVA of between £741m and £1,220m of GVA over its lifetime, including the multiplier effects.

Table 20.10 GVA Effects in £ Millions (2011 prices) Over Wind Farm Lifetime

| | Study Area | | | Scotland | | | Rest of UK | | |
|---------------------------------|------------|--------------------------|------------|----------|--------------------------|--------------|------------|--------------------------|------------|
| | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total |
| Low case | | | | | | | | | |
| Development/ construction | 17 | 9 | 25 | 174 | 138 | 313 | 292 | 308 | 600 |
| Operations & decommissioning | 137 | 63 | 200 | 263 | 165 | 428 | 141 | 122 | 263 |
| Low total | 153 | 72 | 225 | 438 | 303 | 741 | 433 | 431 | 864 |
| High case | | | | | | | | | |
| Development/ construction | 63 | 35 | 98 | 316 | 243 | 559 | 300 | 316 | 616 |
| Operations & decommissioning | 245 | 113 | 358 | 412 | 249 | 661 | 133 | 119 | 252 |
| High total | 308 | 148 | 455 | 728 | 492 | 1,220 | 433 | 435 | 868 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: GVA is the total relating to the expenditure of the full budget over the life of the Project

Note: numbers may not add owing to rounding

20.4.1.1 Conclusions on significance

159. The assessment of significance is based on the expenditure associated with the full 1,000 MW proposal and on the results produced under the low case scenario.

Sensitivity

160. GVA represents the difference between the value of goods and services produced and the cost of raw materials, from which is paid wages, salaries and profits. It is therefore a core measure of economic wealth. While Aberdeen and Aberdeenshire produce a high level of GVA per head relative to Scotland, the figures for Moray and Highland are lower than the Scottish average. Wages, salaries and income are all important elements in determining quality of life for residents in the study area and in Scotland. Sensitivity to changes in GVA is therefore considered to be high.

Magnitude

161. The magnitude of the GVA generated by the Wind Farm, both at the Study Area level and in Scotland, is judged to be high in the low case scenario.

Significance

162. Combining the sensitivity and magnitude assessments, the GVA effect associated with the expenditure on the development, construction, operation and

decommissioning of the Wind Farm is considered to be of major significance, and therefore significant in terms of the EIA Regulations for both the construction and operating phase.

Table 20.11 GVA significance

| GVA | Sensitivity | Magnitude | Significance | Significant (Y/N) |
|------------------------------|-------------|-----------|--------------|-------------------|
| Development & construction | High | High | Major (+) | Y |
| Operations & decommissioning | High | High | Major (+) | Y |

20.4.2 EMPLOYMENT EFFECTS

163. Table 20.12 summarises the projected employment effect of the Wind Farm associated with the low and high case scenarios. For the Study Area, the total number of 'job years'³ is anticipated to range between approximately 3,600 and 7,800 across the whole lifetime of the Project. For Scotland including the Study Area, this is between approximately 11,900 and 20,300 job years.

Table 20.12 Employment effects in Job Years

| | Study Area | | | Scotland | | | Rest of UK | | |
|------------------------------|--------------|--------------------|--------------|---------------|--------------------|---------------|--------------|--------------------|---------------|
| | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total |
| Low case | | | | | | | | | |
| Development/ construction | 300 | 100 | 400 | 3,100 | 2,700 | 5,800 | 5,700 | 4,900 | 10,600 |
| Operations & decommissioning | 1,800 | 1,400 | 3,200 | 3,500 | 2,700 | 6,100 | 2,400 | 1,200 | 3,600 |
| Low total | 2,100 | 1,500 | 3,600 | 6,600 | 5,400 | 11,900 | 5,700 | 4,900 | 10,600 |
| High case | | | | | | | | | |
| Development/ construction | 1,100 | 700 | 1,800 | 5,500 | 4,600 | 10,100 | 5,900 | 5,000 | 10,900 |
| Operations & decommissioning | 3,400 | 2,600 | 6,000 | 5,700 | 4,500 | 10,200 | 2,500 | 2,000 | 4,500 |
| High total | 4,500 | 3,300 | 7,800 | 11,200 | 9,100 | 20,300 | 8,400 | 7,000 | 15,400 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: numbers may not add owing to rounding

20.4.2.1 Employment Profile

164. Plate 20.6 and Plate 20.7 show the difference between employment in the low case and high case for the Study Area, broken down by year. It is clear that the greatest

³Job years represent the equivalent of employment for one year and do not represent the number of people employed by the Project

number of jobs will be generated during the construction phase of the Wind Farm (2014 - 2018). However, this employment is short-term, only lasting up to five years. The operations and maintenance phase offers longer term employment opportunities across the working life of the Wind Farm. The decommissioning phase provides further employment opportunities.

Plate 20.6 Study Area Employment by Year - Low Case and High Case

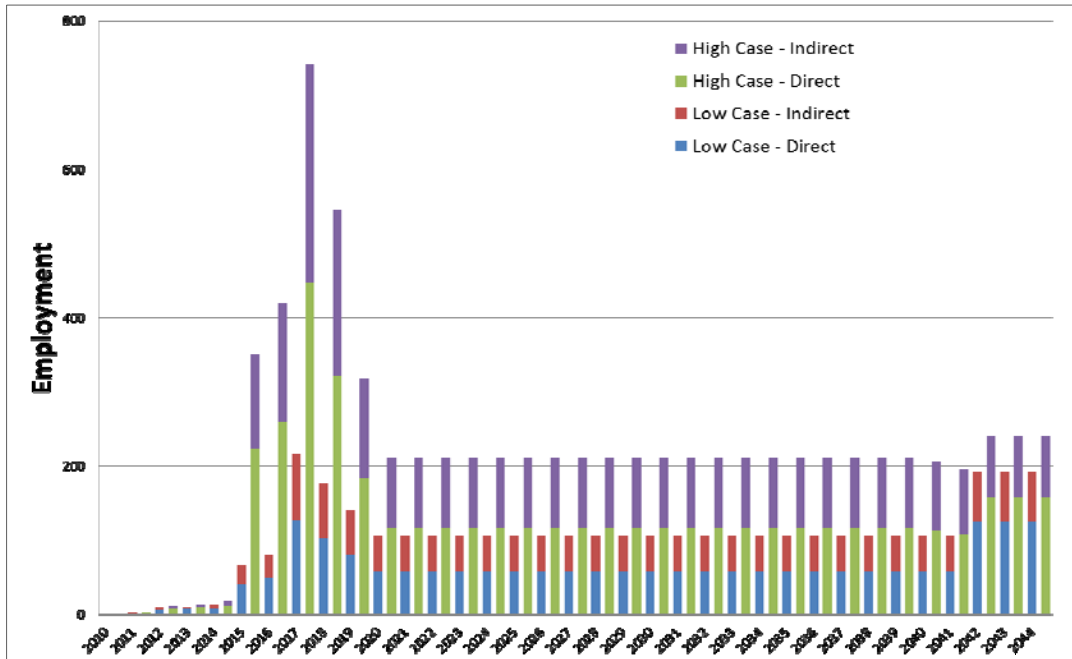
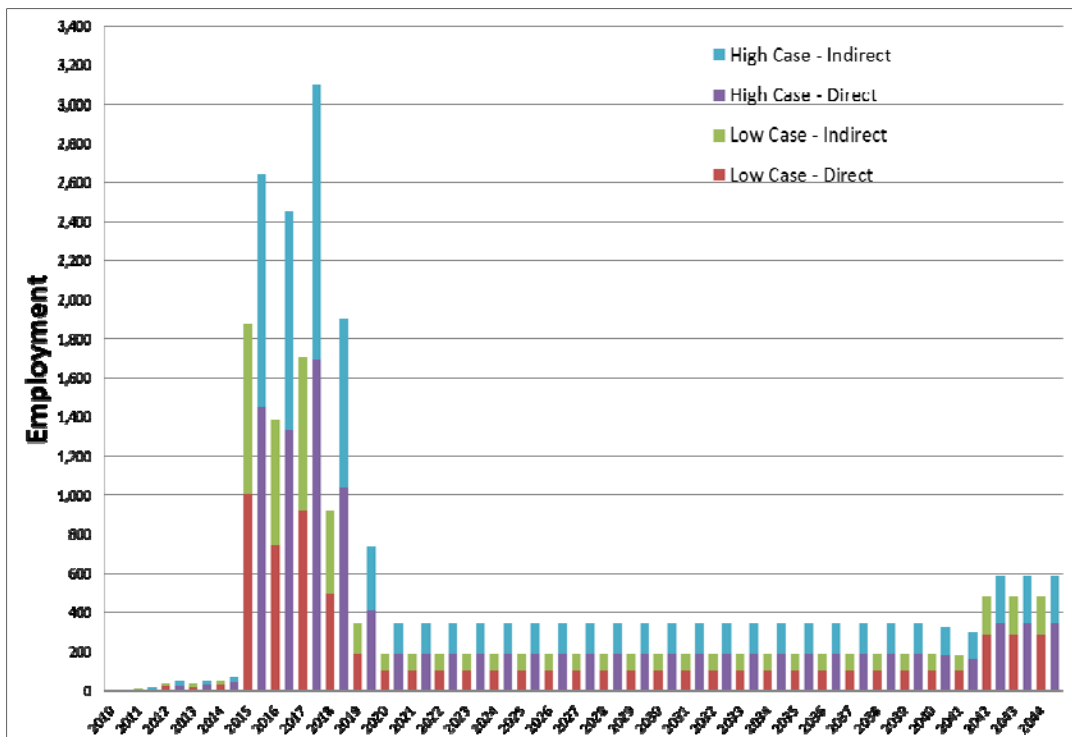


Plate 20.7 Scotland Area Employment by Year - Low Case and High Case



20.4.2.2 *Employment Effect Summary*

165. Within the Study Area the employment effect summary is as follows.

- Low case: during the construction phase, the Wind Farm would support 220 jobs in the peak year and, during the operations phase, this would fall to 110 jobs, including multiplier effects;
- High case: during the construction phase, the Wind Farm would support a peak of just over 740 jobs, including multiplier effects. During the operations phase this would be just over 210 jobs, including multipliers.

166. In Scotland (including the Study Area) the employment effect summary is as follows (see also Table 20.13):

- Low case: during the construction phase, the Wind Farm would support almost 1,710 jobs at its peak, including multiplier effects. During the operations phase this would fall to 190 jobs;
- High case: during the construction phase, the Wind Farm would support almost 3,100 jobs in the peak year, including multiplier effects. During the operations phase this would be around 340 jobs.

Table 20.13 Employment Effect Summary

| | Construction phase (peak employment) | | | Operations phase | | |
|-----------------------------|--------------------------------------|--------------------|-------|------------------|--------------------|-------|
| | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total |
| Low Case | | | | | | |
| Study Area | 130 | 90 | 220 | 60 | 50 | 110 |
| Scotland (incl. Study Area) | 920 | 790 | 1,710 | 110 | 80 | 190 |
| High Case | | | | | | |
| Study Area | 450 | 300 | 740 | 120 | 90 | 210 |
| Scotland (incl. Study Area) | 1,690 | 1,410 | 3,100 | 190 | 150 | 340 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: Construction figures are for the peak year of employment (2017), operations figures are the steady employment over the 25 year life of the Wind Farm

Note: numbers may not add owing to rounding

20.4.2.3 *Conclusions on significance*

The assessment of significance is based on the expenditure associated with the full 1,000 MW proposal and on the results produced under the low case scenario.

Sensitivity

167. Employment is a core measure of economic activity, reflected in the importance attached to rates of employment and unemployment. Levels of unemployment and the availability of employment opportunities are very important for the economic

health of communities, the Study Area and Scotland. Changes in employment are therefore considered to be of high sensitivity.

Magnitude

168. Within the Study Area, the assessment suggests that employment associated with the Wind Farm would peak at between 220 and 740 jobs depending on which scenario emerges, during the construction phase, falling back to between 110 and 210 jobs, including multipliers, during operations. There is a slight increase in employment again associated with decommissioning.
169. In Scotland, the employment associated with the Wind Farm would peak at between 1,700 and 3,100 jobs in 2017, during the construction phase. During operations this would be between approximately 190 and 340, including multiplier effects (see Table 20.13). There is an increase in employment associated with decommissioning.
170. At both the level of the Study Area and in Scotland, these levels of employment are considered to be of high magnitude for the low case.

Significance

171. Combining the sensitivity and magnitude assessments, the employment effect associated with the development, construction, operation and decommissioning of the Wind Farm is a major positive effect and is therefore considered to be significant in terms of the EIA Regulations.

Table 20.14 Employment significance

| | Sensitivity | Magnitude | Significance | Significant (Y/N) |
|-------------------------------|-------------|-----------|--------------|-------------------|
| Development and Construction | High | High | Major (+) | Y |
| Operation and Decommissioning | High | High | Major (+) | Y |

20.4.3 TOURISM EFFECTS

172. The tourism element of the analysis considers the effect of the Wind Farm on the volume and value of tourists visiting the Study Area. The analysis distinguishes between two types of effect:

- Direct effects on local tourism assets; e.g. physical changes to public rights of way, paths, scenic areas and so on, which the Wind Farm may cause at different phases; construction, operation, maintenance and decommissioning. Direct effects could also include factors such as closure or diversion of access to tourism assets or the removal of those assets; and
- Indirect effects on local tourism assets. In this case, indirect effects mainly relate to changes in amenity through the permanent or temporary modification of land and seascapes and the visual effect of the Wind Farm. There could also be effects as a result of any disturbance or injury to coastal or marine wildlife interests (e.g. for wildlife watching) during construction, operation or decommissioning of the Wind Farm.

20.4.3.1 *Direct Effects*

173. Because the physical construction of the components will take place on commercial premises and the installation and decommissioning will be offshore, there is not considered to be a direct effect on tourism from the Wind Farm itself. However, there is the potential for the offshore installation work to have some effect in relation to sailing. This is assessed in Section 18: Shipping and Navigation.

20.4.3.2 *Indirect Effect*

Leisure Tourism

174. The indirect effects are based on the visual effects of the Wind Farm and how tourists are likely to respond to this and on any potential change to the presence of marine wild life, particularly the bottle nose dolphins and minke whale tours. The scale of tourism and the scale of any effect is a key factor in determining the significance of this effect.
175. The SLVIA identifies the areas where visibility is greatest and therefore where the Wind Farm is most likely to have an effect. The ZTV used illustrates the theoretical worst case scenario of the Wind Farm in terms of the extent of visual exposure.
176. It concludes that key tourist destinations such as John O' Groats and Duncansby Head will not be significantly affected. However, it finds moderate or major magnitude effects at six of the 16 viewpoint sites; Wick Bay, Sarclet, Hill O'Many Stanes, Lybster, Dunbeath (nr Heritage Centre) and Whaligoe Steps. In relation to these points, Wick has the greatest visitor accommodation capacity and is home to many of the attractions in the area, Hill O'Many Stanes, the Dunbeath Heritage Centre and Whaligoe Steps are local visitor attractions.
177. Overall, the Wind Farm will be visible, with a moderate or major magnitude, to visitors at a number of places on the coast that are of interest to tourists. Coupled with the visibility from the A9 and A99, most visitors within the 40 km zone will view the Wind Farm during their trip (subject to weather).
178. Any impact on marine wildlife tourism is closely related to the opportunities for tourists to see marine mammals. The Aberdeen Centre for Environmental Sustainability (ACES) study estimated that there were 63,000 people staying overnight on a trip that included dolphin watching.
179. The Marine Mammals Assessment (Section 12) concludes that the noise generated by piling during the construction phase of the Wind Farm would be the biggest potential source of impact. The noise level has the potential to change the behaviour of marine mammals, which could in turn reduce the attractiveness of the area for tourists.
180. The Marine Mammals Assessment (Section 12) maps the presence of bottlenose dolphins in the Moray Firth and shows that they tend to stay relatively close to the shore, where the noise during construction would be below the threshold that would cause a strong behavioral avoidance (90 dBht) (Section 12.2.7.5). However, there may be some short-term, temporary disturbance for a small number of the

population which could lead to some displacement. This could be closer to the shore or possibly, in a small number of cases, outside the Moray Firth.

181. The impact for the seal population would be greater because they are more widely distributed in the Moray Firth. This is more likely to cause displacement and the impact would be significant in the short term for harbour seal, however no significant effect is predicted for grey seals. In the longer term, even under the worst case scenario, the population would recover and the impact would be minor for all seal species.

Sensitivity

182. In relation to the sensitivity of tourism activity to the presence of wind farms. The most detailed study available for Scotland was produced by Glasgow Caledonian University (2008) for the Scottish Government. The key results are discussed in Section 20.3.4 earlier.

183. While the study concluded that a significant minority (20% to 30%) of tourists preferred landscapes without wind farms, only a very small group changed their intentions about revisiting an area or Scotland. Under the worst case, visitors, on average, indicated that they would be 2.5% less likely to return. The survey findings were supported by a literature review that concluded that overall there is no evidence to suggest a serious negative economic effect of wind farms on tourists.

184. There are some contextual elements in considering the findings in relation to this proposal. Firstly, the findings are based on wind farms in general and not offshore ones and there may be differences in how visitors react to changes in seascapes rather than landscapes. Secondly, the distances to offshore wind farms may make them less intrusive than has been assumed in these surveys for onshore wind farms, although the offshore turbines are larger.

185. This review did not find any robust evidence to suggest a serious negative visual effect of wind farms on tourism. As such the sensitivity of tourism in the Study Area to the visual effect of the Wind Farm is considered to be low.

186. The second source of effect is the sensitivity of visitors attracted to watch the marine wildlife to the Wind Farm. This sensitivity depends on the extent to which the Wind Farm impacts on the marine wild life and particularly dolphins. The Marine Mammals Assessment concludes that there may be some short term disturbance, but that the majority of the dolphins are found outside the noise range that would cause behavioural effects (75dB and above). Tourists visiting because of the marine wildlife are therefore considered to some extent, to be sensitive to the presence of the Wind Farm. The sensitivity of visitors to the Wind Farm is assessed as medium.

Magnitude of Effect

187. The magnitude of the effect depends on both the scale of tourism activity that would be subject to any effect and the size and duration of the effect itself. The number of visitors staying within the immediate area of the Wind Farm and those on day trips represent those that are most likely to be influenced by the visual

effect. As described in the baseline, within 40 km of the Wind Farm Site there are 57 establishments, with 294 rooms and capacity for 600 sleepers. Much of this capacity is in and around Wick. Using estimates of bed occupancy (40%) this would indicate that there would be around 88,000 visitor nights a year. The average length of stay of visitors to the Highlands is 4.7 nights and on this basis there would be around 19,000 staying visitors within 40 km of the Wind Farm.

188. In addition there will be some recreational day trips to the area to visit the coast and others driving through the immediate area. There are no estimates of day visits although distances from major centres of population will limit the number.
189. The figures here are intended as a broad estimate to provide an indication of the scale of tourist activity within the immediate area. The estimate of 19,000 compares with VisitScotland's estimate of 2.1 million staying visitors in Highland, in 2010, and 1.4 million to Aberdeen and Grampian. Relative to the Study Area the number of visitors that would be exposed to the Wind Farm is likely to be small and therefore the magnitude of the effect on tourism is considered to be low.
190. In relation to marine tourism, the magnitude of the effect is determined by its scale, duration and the number of people it affects. As described in relation to sensitivity, the Marine Mammals Assessment (Section 12) indicates that there could be some minor disturbance and displacement of dolphins and seals, in the short term. It is not likely that the number of dolphins displaced would be as large as to impact on the tourists' opportunities to see them. The effect on tourism is therefore considered to be low.

Significance

191. Significance is assessed by combining the assessment of sensitivity with magnitude. For the visual impact the sensitivity of tourists and magnitude of effect are both considered to be low, while for marine tourism the sensitivity is medium and the magnitude low. Both elements are assessed as having a minor negative effect which is not significant under the EIA Regulations.

Business Tourism Effects

192. Tourism Resource Consultants (TRC) carried out an analysis of the business tourism market for Caithness in Sutherland in 2010. In relation to the energy sector it comments that *"the renewables sector potentially presents a massive opportunity for the C&NS area however the amount of accommodation demand that it will generate is completely unknown and research that we have carried out cannot confirm the level of accommodation demand or even if the sector will need accommodation on an on-going basis."*
193. The analysis goes on to make some broad estimates, based on the experience of Dounreay, where there are around 8 - 16 bed nights generated for each direct job. In other words, for every 100 direct jobs created there would be demand for 800 to 1,600 serviced accommodation bed nights. This is very uncertain and depends on the extent to which the area benefits from additional economic activity and the nature of these jobs, but points to some increase in business tourism.

Significance

194. The sensitivity of business tourism within the Study Area will vary across the geography with some service providers' activities strongly affected and others much less so. Overall the potential increase in demand generated by the Wind Farm development is considered to be medium.
195. The magnitude of the effect is likely to be positive, but fairly modest, depending on the use of local facilities at each phase of the Wind Farm. It is not possible to quantify but an estimate of low magnitude has been made, relative to overall tourism activity in the Study Area.
196. Combining the sensitivity and magnitude assessments gives a minor, positive effect and business tourism is therefore not significant under the EIA Regulations.

Table 20.15 *Tourism Effect Summary*

| | Sensitivity | Magnitude | Significance | Significant (Y/N) |
|------------------|-------------|-----------|--------------|-------------------|
| Leisure tourism | Low | Low | Minor | N |
| Business tourism | Medium | Low | Minor | N |

20.4.4 OTHER RECREATION

20.4.4.1 Surfing and Sea Kayaking

197. Other recreational receptors discussed in the baseline include surfers, sea kayakers and walkers. An effect on surfing would occur if the Wind Farm affected the quality of the waves or the visual effect reduced the number of surfers. The surfing wave quality is critical to the attraction of a location. A study of Scroby Sands (reported in MS (2011)) found that the turbines 1.75 km offshore had a negligible effect on wave quality at the shoreline. The sensitivity to the Wind Farm which is at many times this distance from the shore is therefore low.
198. The magnitude of the effect is determined by the scale of the effect and the number of people participating. Both of these are considered to be low. The significance of effect is therefore considered to be minor and therefore not significant in terms of the EIA Regulations.
199. The Wind Farm is unlikely to have any effect on sea conditions for kayaking. Sensitivity is low given that the main attraction of the location is access to the sea rather than the view of the seascape. The magnitude of the effect and the number of people is also considered to be low and therefore the significance of effect overall is considered to be minor and therefore not significant in terms of the EIA Regulations.

20.4.4.2 Walking

200. It is worth noting that the Glasgow Caledonian University report (2008) on tourism effects found that, of those engaged in various tourist activities, walkers were less opposed to wind farms than the average in the survey.

201. In relation to the magnitude of the effects, the coastal path at Duncansby Head would be a considerable distance from the Wind Farm which will be noticeable but not a prominent part of the view. The SLVIA (Section 14) concludes that the magnitude of effect on users of the coastal paths near Duncansby Head is low.
202. The coastal path at Lybster provides an elevated view which looks towards the Wind Farm and the SLVIA concludes that this will become a characteristic of the view from the coast. The magnitude of the visual effect was judged as high to medium. For other short heritage paths along the coast which focus on historic industry and fishing stations rather than sea views, the SLVIA concludes that the presence of the Wind Farm will not significantly alter the character to users of the public paths.
203. The sensitivity of recreational walking to the presence of the Wind Farm is considered to be low (few people would be expected not to walk because of the visual effect) and the magnitude of the effect based on the limited visual effect on the main paths is judged to be low. The overall significance of effect is considered to be minor and therefore not significant in terms of the EIA Regulations.

Table 20.16 Other Recreational Effects Summary

| | Sensitivity | Magnitude | Significance | Significant (Y/N) |
|--------------------------|-------------|-----------|--------------|-------------------|
| Surfing and sea kayaking | Low | Low | Minor | N |
| Walking | Low | Low | Minor | N |

20.4.5 OTHER SOCIO-ECONOMIC EFFECTS

204. Most of the social effects are derived from the economic and environmental conditions and are difficult to assess directly, although some elements can be inferred from other aspects of the analysis.
205. Some of the effects are the result of changes in the demand for labour and services and have the potential to bring positive social changes, through generating income for the area. Income will also be generated indirectly through the supply of some services to contractors and also through the spending of wages and salaries within the local economy. This in turn helps maintain shops, bars, restaurants and other local services within the Study Area, contributing to quality of life.
206. There is uncertainty around how much activity will be generated as a result of the Wind Farm and where it will take place. Decisions have yet to be taken on the use of any port(s) in the Study Area, or the locations for assembly, construction and operation and maintenance activity. With regard to social effects, it will be of considerable importance to specific communities where these activities are undertaken.
207. The baseline estimates suggest that the population within the Study Area has increased and is expected to increase further to 2032, with the fastest growth in Aberdeenshire. The Wind Farm development is likely to contribute to this by providing employment and encouraging some residents to stay and bringing others

to the area. This would also help maintain the proportion of working age residents in the population which was expected to fall slightly.

208. In the past many new residents have moved to the area to work at the airbases and Dounreay, as well as the fabrication yards, so the towns in the Study Area are accustomed to accommodating new workers. Whether or not the number is significant enough to effect on the lives of these communities, or on the provision of public services, will depend on where activity takes place. However, for some areas, the employment opportunities and additional income would be a major benefit for sustaining their communities and ensuring other local businesses and services remain viable.
209. With the decommissioning of Dounreay and the changing status of RAF Kinloss, there are likely to be engineers that could be employed. In addition HIE understand that there are other past residents, with appropriate skills, that are keen to come back to the area to work. Some of the technical employment will be met by people moving into the area, perhaps initially working with the turbine manufacturer or other contractors.
210. Income will also be generated indirectly through the supply of some services to contractors and also through the spending of wages and salaries within the local economy. This in turn helps maintain shops, bars, restaurants and other local services within the Study Area, contributing to quality of life.

20.5 EFFECTS MITIGATION AND ENHANCEMENT

20.5.1 EFFECT MITIGATION MEASURES

211. For the purposes of the assessment of socio-economic effects, only negative effects of moderate significance or above are deemed significant under the terms of the EIA Regulations. From the assessment above there are no effects of moderate or greater significance and therefore no mitigation is required.

20.5.2 RESIDUAL EFFECTS

212. As there are no likely significant negative effects identified in the assessment, there are no mitigation measures and the residual effects are as per the assessment conclusions.

Table 20.17 Socio-economic, Tourism and Recreation Effects Summary

| | Assessed significance | EIA Significant Y/N | Mitigation | Residual effect |
|---|-----------------------|---------------------|------------|-----------------|
| GVA | Major (+) | Y | - | Major (+) |
| Employment | Major (+) | Y | - | Major (+) |
| Leisure tourism | Minor (-) | N | - | Minor (-) |
| Business tourism | Minor (+) | N | - | Minor (+) |
| Other recreation (surfing, walking, sea kayaking) | Minor (-) | N | - | Minor (-) |

20.5.3 EFFECT ENHANCEMENTS

213. Maximising positive effects or minimising “not significant” negative ones is termed enhancement.
214. The main measure identified would be to maximise local employment opportunities, as far as possible, through liaison with HIE, SE and SDI, and through other activities that raise awareness of the opportunities that the Wind Farm provides. This would help to move the potential GVA and employment outcomes from the “low” case toward the levels estimated from the “high” case.
215. This would have a positive effect on the estimates of retained income and employment within the Study Area and Scotland. These effects will have a direct effect on other social and economic conditions in the Study Area. Greater employment opportunity will generate more income locally and, in turn help to support population, local businesses and the provision of services in some communities.
216. Tourism-related enhancement could be used to further reduce the minor negative effect on leisure tourism. This would include working with tourism organisations to encourage activities to present and promote the Wind Farm and by supporting visitor interpretation and awareness.

20.6 SUMMARY OF EFFECTS

217. The following Table 20.18 brings together the results of the assessment, across a number of variables.

Table 20.18 Effects Summary

| | Sensitivity | Magnitude | Assessed significance | EIA Significant Y/N |
|---|--------------------|------------------|------------------------------|----------------------------|
| GVA Development and Construction | <i>High</i> | <i>High</i> | <i>Major (+)</i> | <i>Y</i> |
| GVA Operation and Decommissioning | <i>High</i> | <i>High</i> | <i>Major (+)</i> | <i>Y</i> |
| Employment Development and Construction | <i>High</i> | <i>High</i> | <i>Major (+)</i> | <i>Y</i> |
| Employment Operation and Decommissioning | <i>High</i> | <i>High</i> | <i>Major (+)</i> | <i>Y</i> |
| Leisure tourism | <i>Low</i> | <i>Low</i> | <i>Minor (-)</i> | <i>N</i> |
| Business tourism | <i>Medium</i> | <i>Low</i> | <i>Minor (+)</i> | <i>N</i> |
| Other recreation surfing and sea kayaking | <i>Low</i> | <i>Low</i> | <i>Minor (-)</i> | <i>N</i> |
| Other recreation walking | <i>Low</i> | <i>Low</i> | <i>Minor (-)</i> | <i>N</i> |

20.7 ASSESSMENT OF CUMULATIVE EFFECTS

20.7.1 INTRODUCTION

218. Given below is the assessment of cumulative socio-economic effects arising from the Project including both the Wind Farm and OfTW in conjunction with other existing or foreseeable planned Project/development activities.

219. A CIADD (MFOWDG, 2011) was produced which set out the developments to be considered and the assessment method for each technical assessment and is the basis of this assessment. The CIADD is presented in Annex 5B.

20.7.2 SCOPE OF ASSESSMENT

220. At the time of drafting the CIADD (MFOWDG, 2011) the socio-economic consultant had not been appointed and hence no scope or method was presented.

221. The assessment of significance of cumulative effects has used the same criteria to determine significance as presented in Section 20.2.

222. The assessment of cumulative effect has been made against the existing baseline conditions as presented in Section 20.3 for the Wind Farm component and 29.3 for the offshore transmission works.

223. The cumulative effects are difficult to define in relation to socio-economic variables, as they are not necessarily defined by geography. The cumulative effect assessment for socio-economic effects has been considered in the following manner:

- In relation to the employment and GVA effects anticipated from the Project investment, the cumulative effect depends on the extent to which the supply chain has the capacity to meet demand from a number of projects. In other words the cumulative effect brings into consideration the possibility that some of the employment benefits may not be realised because of competing projects. In this sense, the cumulative effect may not be limited to wind farms, but also to other major projects over the same time frame, including oil and gas investment;
- In relation to tourism and recreation, cumulative effects are interpreted as the combined effects of the proposal with other existing and proposed wind farms within 60 km of the Wind Farm Site. This is related to the cumulative visual effect and the conclusions linked to the SLVIA (Section 14); and
- Other social measures, seen in relation to cumulative effects, are a result of the combination of these two elements.

20.7.3 CONSULTATION

224. The CIADD (MFOWDG, 2011) was presented to MS for review in April 2011 for comment. The scope and method were not presented in this document for the assessment of socio-economic and tourism effects.

225. The scope and methodology for the assessment of cumulative effects was agreed through consultation with the key stakeholders and consultees as detailed in Table 20.1.

20.7.4 GEOGRAPHICAL SCOPE

226. The geographical scope for the assessment of GVA and employment is the same for cumulative effects as for the assessment. The geographical scope is therefore presented in Section 20.2.1.
227. The geographical scope for the assessment of the cumulative effects on tourism is defined as 60 km from the Wind Farm Site. The SLVIA has scoped out the visual effects of the OfTW from its assessment in agreement with consultees. As the effect on tourism is related to the visual effect of the development and its intervisibility with tourism attractions the OfTW is not considered in terms of cumulative effects on tourism. With regard to the Wind Farm Site the SLVIA defined the relevant Study Area for the assessment of cumulative effects as 60 km from the Wind Farm Site. This is also the geographical extent for the consideration of cumulative effects on tourism.

20.7.5 DEVELOPMENTS CONSIDERED IN ASSESSMENT

228. Section 4.13 of the CIADD (MFOWDG, 2011) (Appendix 5B) presented developments which should be considered in the assessment of cumulative effects with the BOWL Project with regard to socio-economics. These were:
- Other Offshore Wind Farms and Infrastructure:
 - individual sites within the Moray Firth Round 3 Zone Eastern Development area;
 - Moray Firth Round 3 Zone Western Development area;
 - Aberdeen Bay Offshore Wind Farm;
 - Neart na Gaoithe;
 - Firth of Forth Round 3 sites;
 - Beatrice Demonstrator Turbines;
 - Methil Offshore Wind farm; and
 - Proposed SHETL hub.
 - Shipping;
 - Civil and Military Aviation;
 - Port and Harbour Developments in the Moray Firth;
 - Oil and Gas Developments:
 - Beatrice and Jacky platforms and associated infrastructure;
 - The proposed Polly Well; and
 - The proposed Caithness and PA Resources infrastructure for existing leases.
229. As stated above the cumulative effect on GVA and employment depends on the extent to which the supply chain has the capacity to meet demand from a number of projects. The cumulative effect may not be limited to wind farms, but also to other major projects over the same time frame, including oil and gas developments, other offshore wind farms and other major developments such as port and harbour works.
230. The effects on shipping are considered in Section 18 Shipping and Navigation and are not discussed here. Aviation effects are assessed in Section 19: Aviation and are not presented here.

231. With regard to the assessment on tourism, offshore wind farms as noted in the CIADD were considered, as were onshore wind farms within a 60 km study area determined by the seascape, landscape and visual assessment with regard to cumulative effects. The offshore developments listed in the CIADD outwith this 60 km study area were not assessed for cumulative effects. The developments considered for cumulative visual effects were therefore onshore wind farms within 60km of the Wind Farm Site and the proposed Moray Firth Round 3 Zone development. A list of the applicable developments is provided in the cumulative assessment within the SLVIA (Section 14) of this ES.
232. Section 20 of this ES presents the assessment of the socioeconomic effects of the Wind Farm and Section 29 socioeconomic effects of the OfTW. As a part of the assessment of cumulative effects these components have been assessed cumulatively to present the socio-economic effects of the Project as a whole. This is presented below.
233. The OnTW will also present socio-economic effects. The OnTW is subject to a separate planning application under the Town and Country Planning regime and the findings of the assessment will be presented in that application. With regard to cumulative impacts the expenditure on the OnTW would be minimal compared to the Wind Farm and OfTW and hence whilst an increase in GVA and Employment effects are anticipated, this will not change the level of significance which has been found to be a major positive effect (see below). With regard to tourism the majority of the effects are related to the visual effect of the Wind Farm and OfTW on tourism receptors. The visual effects associated with the OnTW are solely related to the substation which is outwith the 60km study area for the assessment of cumulative visual effects. As such the cumulative effects of the Wind Farm and OnTW are not considered further.

20.7.6 PREDICTED EFFECTS: WIND FARM AND OfTW CUMULATIVE EFFECTS

234. The analysis in Section 20.4 assesses the Wind Farm excluding the supply and installation of the export cables (OfTW). As part of the cumulative assessment these have been added together to provide the overall range of values for both elements.
235. In Scotland the expenditure made by the proposed Wind Farm and OfTW would generate GVA of between £748m and £1,237m of GVA over its lifetime, including the multiplier effects (Table 20.19)

Table 20.19 GVA Impacts in £ Millions (2011 prices) Over Project (Wind Farm and OfTW) Lifetime

| | Study Area | | | Scotland | | | Rest of UK | | |
|------------------------------|------------|--------------------|-------|----------|-------------------|-------|------------|-------------------|-------|
| Low case | Direct | Indirect + induced | Total | Direct | Indirect+ induced | Total | Direct | Indirect+ induced | Total |
| Development/ construction | 18 | 9 | 27 | 179 | 141 | 320 | 301 | 316 | 617 |
| Operations & decommissioning | 137 | 63 | 200 | 263 | 165 | 428 | 141 | 122 | 263 |
| Low total | 155 | 72 | 227 | 442 | 306 | 748 | 442 | 438 | 880 |
| High case | Study Area | | | Scotland | | | Rest of UK | | |
| Development/ construction | 64 | 35 | 99 | 326 | 250 | 576 | 314 | 329 | 643 |
| Operations & decommissioning | 245 | 113 | 358 | 412 | 249 | 661 | 133 | 119 | 252 |
| High total | 309 | 148 | 457 | 738 | 499 | 1,237 | 447 | 448 | 895 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: GVA is the total relating to the expenditure of the full budget over the life of the Project

Note: numbers may not add owing to rounding

236. The sensitivity, magnitude and significance are based on the Low case estimates.

Sensitivity

237. As for the Wind Farm (Section 20.4.1.1), this is considered to be high

Magnitude

238. The magnitude of the GVA generated by the proposed Wind Farm and OfTW, both at the Study Area level and in Scotland, is judged to be high.

Significance

239. Combining the sensitivity and magnitude assessments, the GVA impact associated with the expenditure on the development, construction, operation and decommissioning of the Wind Farm and OfTW is considered to be of major significance, and therefore significant in terms of the EIA Regulations for both the construction and operating phase.

Employment Impacts

240. Table 20.20 summarises the projected employment impact of the Wind Farm and OfTW associated with the low and high case scenarios. For the Study Area, the total number of 'job years'⁴ is anticipated to range between approximately 3,600 and 7,800 across the whole lifetime of the Project. For Scotland as a whole this is between approximately 12,000 and 20,400 job years.

⁴Job years represent the equivalent of employment for one year and do not represent the number of people employed by the Project

Table 20.20 Employment Impacts in Job Years

| | Study Area | | | Scotland | | | Rest of UK | | |
|------------------------------|------------|----------------------|-------|----------|----------------------|--------|------------|----------------------|--------|
| Low case | Direct | Indirect+ induced | Total | Direct | Indirect+ induced | Total | Direct | Indirect+ induced | Total |
| Development & construction | 300 | 100 | 400 | 3,200 | 2,700 | 5,900 | 5,900 | 5,100 | 10,900 |
| Operations & decommissioning | 1,800 | 1,400 | 3,200 | 3,500 | 2,700 | 6,100 | 2,400 | 1,200 | 3,600 |
| Low total | 2,100 | 1,500 | 3,600 | 6,700 | 5,400 | 12,000 | 8,300 | 6,300 | 14,500 |
| High case | Study Area | | | Scotland | | | Rest of UK | | |
| Development & construction | 1,100 | 700 | 1,800 | 5,600 | 4,600 | 10,200 | 6,300 | 5,200 | 11,500 |
| Operations & decommissioning | 3,400 | 2,600 | 6,000 | 5,700 | 4,500 | 10,200 | 2,500 | 2,000 | 4,500 |
| High total | 4,500 | 3,300 | 7,800 | 11,300 | 9,100 | 20,400 | 8,800 | 7,200 | 16,000 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: numbers may not add owing to rounding

241. Within the Study Area the profile of the employment is broadly the same as for the Wind Farm on its own. Under the low case, the OfTW jobs add a further 60 jobs in Scotland, and under the high case, 150. This does not change the peak employment which remains as for the Wind Farm itself:
- Low case: during the construction phase, the Project (Wind Farm and OfTW) would support 220 jobs in the peak year and, during the operations phase, this would fall to 110 jobs, including multiplier effects;
 - High case: during the construction phase, the Project would support a peak of just over 740 jobs, including multiplier effects. During the operations phase this would be just over 210 jobs, including multipliers.
242. In Scotland (including the Study Area) the employment impact summary is as follows (see also Table 20.21):
- Low case: during the construction phase, the Project would support almost 1,710 jobs at its peak, including multiplier effects. During the operations phase this would fall to 190 jobs.
 - High case: during the construction phase, the Project would support almost 3,100 jobs in the peak year, including multiplier effects. During the operations phase this would be around 340 jobs.

Table 20.21 Employment Impact Summary

| | | Construction phase (peak employment) | | | Operations phase | | |
|-----------------------------|-----------|--------------------------------------|--------------------|-------|------------------|--------------------|-------|
| | | Direct | Indirect + induced | Total | Direct | Indirect + induced | Total |
| Study area | Low case | 130 | 90 | 220 | 60 | 50 | 110 |
| | High case | 450 | 300 | 750 | 120 | 90 | 210 |
| Scotland (incl. Study Area) | Low case | 920 | 790 | 1,710 | 110 | 80 | 190 |
| | High case | 1,690 | 1,410 | 3,100 | 190 | 150 | 340 |

Note: the indirect multiplier employment includes both indirect and induced multiplier effects

Note: Construction figures are for the peak year of employment (2017), operations figures are the steady employment over the 25 year life of the Wind Farm

Note: numbers may not add owing to rounding

Sensitivity

243. As for the Wind Farm (Section 20.4.2.3), changes in employment are considered to be of high sensitivity.

Magnitude

244. Within the Study Area, the assessment suggests that employment associated with the Project (Wind Farm and OfTW) would peak at between 220 and 740 jobs depending on which scenario emerges, during the construction phase, falling back to between 110 and 210 jobs, including multipliers, during operations. There is a slight increase in employment again associated with decommissioning.
245. In Scotland, the employment associated with the Project would peak at between 1,700 and 3,100 jobs, during the construction phase. During operations this would be between approximately 190 and 340, including multiplier effects (see Table 20.21).
246. At both the level of the Study Area and in Scotland, these levels of employment are considered to be of high magnitude.

Significance

247. Combining the sensitivity and magnitude assessments, the employment impact associated with the development, construction, operation and decommissioning of the Wind Farm and OfTW is a major positive effect and is therefore considered to be significant in terms of the EIA Regulations.

20.7.7 PREDICTED EFFECTS: WIDER CUMULATIVE

Employment and GVA effects

248. The cumulative effects of the Project combined with other wind developments in the Moray Firth i.e. the Moray Firth Round 3 Zone Project will increase the overall effect on GVA and employment within the cumulative study area.
249. However, the estimates of the economic activity associated with the investment in the Wind Farm and OfTW are based on the capacity of the supply chain to meet the

demand for goods and services. When considered, cumulatively, alongside other major construction projects, there may be constraints on the capacity of the supply chain if they successfully secure contracts with other developments. The scale of these supply constraints depends on levels of investment and availability of skills over the next few years.

250. In this sense the cumulative effect depends on the timing of other projects and their competing demand. This increase in demand may reduce the capacity of the Scottish supply chain to successfully secure contracts, which may lead to more procurement from outside Scotland. This would lead to a reduction in the number of jobs and amount of GVA supported by the Wind Farm and OfTW.
251. The Alliance Agreement, with its partners, should ensure that the capacity is in place to meet its demand and there is less chance that BOWL will have to consider sourcing from elsewhere in order to meet the timescale.
252. A potential further cumulative effect could occur if the Wind Farm and OfTW were to share any elements of the operations and maintenance support with another operator. This could provide economies of scale, but would in effect reduce the expenditure and therefore employment and GVA in the local economy.
253. The sensitivity of the economy to the employment and GVA that the Wind Farm expenditure would support will remain high. Any supply chain constraints and the related displacement of activity outside Scotland would reduce these effects, but the scale of activity would still be expected to be high. As such the cumulative effects on GVA and employment are considered to be of the same level of significance as was concluded in the assessment of the Wind Farm and OfTW in Section 20.7.6.

20.7.7.1 *Tourism and Recreation*

254. The SLVIA (Section 14) considers the significance of the cumulative visual effects of the Wind Farm with other proposed off and onshore wind farm developments. There is limited evidence of the effects of the visual effects of wind farm developments on tourism, and even less on the cumulative effects. There is therefore a degree of uncertainty in the assessment.
255. For tourism and recreation the primary cumulative effect would occur with the Moray Firth Round 3 Zone. The cumulative effect extends the visual effect to the South and East, and alters views at a number of points. This is caused by both a wider spread and an increased density of turbines, although the Moray Firth Round 3 Zone turbines are further from land.
256. One of the conclusions of the Glasgow Caledonian University (2008) research was that there was a diminishing marginal loss of value associated with increasing the size of wind farms. Once there has been an intrusion into the scenery, the effect on the value of the landscape of expanding the size of the Wind Farm is relatively small.
257. The sensitivity of tourists to the extended cumulative visual effect of the Wind Farm and the Moray Firth Round 3 Zone development would be higher than for the Wind Farm alone. While the sensitivity would remain low, based on the research

described above, the magnitude of the effect would increase marginally as a result of changes to the visual effect. The number of tourists exposed would remain the same as would the duration of the effect. On this basis the magnitude would increase from low to medium. The significance of effect would remain as minor, and under the EIA Regulations would continue to be considered as not significant.

258. Whilst the cumulative visual effect of the two offshore wind farms will be greater than one on its own, there is likely to be a diminishing marginal effect. Any the impact “per turbine” is therefore lower for the combined Beatrice Offshore Wind Farm / Moray Offshore Round 3 Zone site than for one or the other individually.

259. For the tourism associated with marine wildlife, the noise contours for the BOWL and Moray Firth Round 3 Development Zone overlap each other and therefore the area of potential effects on marine mammals is very similar. The duration of the effect on marine mammals is extended when the two developments are considered cumulatively, however due to the nature of the life cycles of marine mammals the effect on marine mammals from the cumulative developments is similar. As such the effect on tourism associated with the cumulative assessment related to marine mammals is as for the Wind Farm assessment presented in Section 20.4.3.

20.7.7.2 *Other Cumulative Effects*

260. The cumulative effect with Moray Offshore Round 3 Zone will also mean that there is a more significant increase in employment opportunities within the local area. This in turn will have greater effects on levels of income, potentially house prices and population. The combined effect of the two projects proceeding would increase the chances of attracting further related investment and employment in support services. In other words, providing a critical mass or cluster of activities that also has the potential to also win work elsewhere. Together these projects make up a large proportion of the UK’s offshore wind capacity and the area around them will have the opportunity to attract investment and build experience that not only creates direct employment but could sell services elsewhere in the world.

20.7.7.3 *Mitigation Measures*

261. Only negative effects of moderate significance or above are deemed significant under the terms of the EIA Regulations. From the assessment above there are no effects of moderate or greater significance and therefore no mitigation is required.

20.7.8 RESIDUAL EFFECTS (POST CUMULATIVE ASSESSMENT)

262. The cumulative effect of the Wind Farm and the OfTW produces a slight increase in the GVA and Employment effects. This remains a major significant effect which is also significant in terms of the EIA Regulations.

263. The cumulative effects of the Project combined with other wind developments in the Moray Firth i.e. the Moray Firth Round 3 Development project, will further increase the cumulative effect on GVA and Employment within the cumulative study area.

264. The consortium arrangement should mean that there is a lower chance of supply constraints reducing the potential employment and GVA effects generated by the

Wind Farm's expenditure (although it might be argued that if the supply chain did not support this Project it could service another). The cumulative effect continues to be of major positive significance for the economy.

265. The cumulative effect of both projects being serviced from the same area may also provide a more attractive base for attracting investment and for the development of the sector. Increased employment opportunities and attracting new people and skills, would be expected to have positive significant effects on levels of employment, population and income.
266. For tourism, the cumulative effect of the Project combined with the Moray Firth Round 3 Development will increase the visual effect, although the impact on tourism remains of minor significance.
267. For marine wildlife tourism, the combined noise contours for the BOWL and Moray Firth Round 3 Development Zone overlap each other and therefore the potential effects on marine mammals are very similar to the assessment for BOWL individually. The effect on tourism related to marine mammals therefore remains minor negative effect, which is not significant under the EIA Regulations.

20.8 STATEMENT OF SIGNIFICANCE

268. Under the terms of the EIA Regulations the number of jobs and level of GVA that would be supported by the anticipated expenditure on the development, construction, operation and decommissioning of the Wind Farm, are considered to be significant positive effects in both the Study Area and Scotland. Under the terms of the EIA Regulations, the effect on tourism and other recreation, covered in this Section, is not considered to be significant.
269. An assessment of the Project (Wind Farm and OfTW) for cumulative effects considered both the cumulative effect of the Wind Farm and OfTW combined, and the cumulative effect of the Project with other developments. The cumulative effects of the Wind Farm and OfTW will increase the positive effects on GVA and Employment slightly and this will remain as a positive significant effect under the EIA Regulations.
270. When assessed cumulatively with other wind farm projects the combined effect will be greater, although issues around timing and capacity constraints could act to limit the extent of the employment and GVA effects. Under the terms of the EIA Regulations the impacts remain as positive significant. For tourism, including marine tourism, and recreation, the cumulative effects are not considered to be significant.
271. No further cumulative significant effects were noted from the assessment.

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