CHAPTER 19: SOCIO ECONOMICS, TOURISM AND RECREATION

Technical Summary

Given the scale of the Seagreen Project, there are expected to be significant beneficial impacts upon the Scottish economy during construction, including direct impacts upon employment, with a large number of full time jobs created in construction and subsequent operation. These gains are likely to occur from the installation of manufacturing or pre-assembly facilities, as well as research and support facilities, by turbine manufacturers and installers supplying the Seagreen Project as well as other wind farm developments in the wider Forth and Tay region.

Given the uncertainties over manufacturing, supply chains etc. it is not possible at this stage to be definitive, particularly with regard to locations for any of these facilities. In addition, port, transport and other support facilities will be required during the construction period. Beneficial impacts are expected to continue during the operation period of the Seagreen Project, with support and port facilities needed by operators to support maintenance and related activities.

Impacts on Tourism and Recreation are expected due to the visibility of the wind farm from the shoreline but these are not assessed as significant. Overall, no adverse impacts were assessed to be significant in EIA terms and no cumulative adverse impacts were anticipated with other projects.

INTRODUCTION

19.1. This chapter of the Environmental Statement (ES) describes the impacts of the Seagreen Project on socio-economic, tourism & recreational receptors.

19.2. The chapter include the following elements:

- consultation;
- assessment methodology including study area and definition of the worst case scenario;
- existing environment which describes the baseline against which the assessment has been made;
- assessment of impacts during construction, operation and decommissioning phases;
- mitigation measures;
- residual impacts; and
- cumulative and in-combination impacts.

19.3. The Seagreen Project will require substantial investment to deliver the project and will need to be supported by a large supply chain. The investment in the Seagreen Project therefore has the potential to affect the socio-economic receptors on a local, regional and national scale such as employment gain through investment into the supply chain industries.

19.4. At this stage of the Seagreen Project development, many factors relating to the expenditure and procurement process are yet to be determined. The potential supply chain benefits of the offshore wind industry in the UK have been documented extensively and are discussed further in Economy – Supply Chain Opportunities (paragraphs 19.77 to 19.81) of this chapter. Quantifying these impacts will depend on supply chain decisions which are yet to be determined and the location of organisations who are able to provide and secure the contracts. As such this chapter presents a high level assessment of the potential socio-economic impacts.

19.5. The Seagreen Project will have the potential to affect receptors associated with tourism and recreational activities. This chapter identifies the key tourism and recreational receptors and provides an assessment of the potential beneficial or adverse impacts associated with the Seagreen Project. The potential impacts of the Seagreen Project on recreational sailing are considered in Chapter 15: Shipping and Navigation which confirms that there will be no heightened risk of collision with recreational vessels and no significant impacts.

19.6. Socio-economic impacts on other commercial sectors, such as commercial fishing, are covered within relevant topic specific chapters in this ES as stated in the Scoping Report (Seagreen, 2010). This chapter has been drafted by Arcus Renewable Energy Consulting Ltd and incorporates results and advice from Seagreen. Technical reports utilised in this assessment are referenced throughout, a full reference list is presented in at the end of this chapter.

CONSULTATION

19.7. A Scoping Report relating to the Seagreen Project was issued to Marine Scotland in July 2010 (Seagreen, 2010), and is provided in Appendix B1 of ES Volume III. This was also issued to numerous consultee organisations as summarised in Chapter 6: EIA Process of this ES and as set out in the Consultation Report that accompanies this application for consent. A summary of responses received in response to the Scoping Report are provided in Appendices B2 and B3 of ES Volume III and summarised in Table 19.1.

19.8. As stated in Chapter 6: EIA Process of this ES and in the Consultation Report that accompanies this application for consent, public consultation events have been held through the consent application process. These events also related to the Onshore Phase 1 Transmission Project which will be assessed in a stand-alone ES. Details on the concerns of the public in relation to the onshore project have been assessed in that separate document.

Table 19.1 Summary of Consultation

Consultee	Comment	Response in ES
Marine Scotland	The concept of economic benefit as a material consideration is explicitly confirmed in the consolidated SPP. This fits with the priority of the Scottish Government to grow the Scottish economy and, more particularly, with our published policy statement Securing a Renewable Future: Scotland's Renewable Energy, and the subsequent reports from the Forum for Renewables Development Scotland (FREDS), all of which highlight the manufacturing potential of the renewables sector. The application should include relevant economic information connected with the project, including the potential number of jobs, and economic activity associated with the procurement, construction operation and decommissioning of the development.	Economic benefit has been assessed utilising industry guidance throughout this chapter.
RYA	Stipulated navigation safety for recreational vessels should be considered. Including information from the UK Coastal Atlas of Recreational Boating. RYA noted the proposals for the operational phase are unlikely to affect recreational routes due to the clearance of 22m and noted they did not believe operational safety zones were required. Noted concerns associated with: • Navigational Safety • Location including visual intrusion and noise; • End of Life [Assumed decommissioning].	Recreational vessel safety is assessed in Chapter 15: Shipping and Navigation. In this ES. The need for and extent of operational safety zones is presented in Chapter 15: Shipping and Navigation. Navigational Safety is covered in Chapter 15: Shipping and Navigation. Chapter 16: SLVIA considers the impacts on visual receptors including sea based receptors. The Seagreen Project has an anticipated operational lifespan of 50 years. At this point a decision will be taken as to whether the site will continue to operate, be repowered or decommissioned. Decommissioning is assessed in Chapter 5 Project Description of this ES. Chapter 15: Shipping and Navigation states the baseline recreational activity for both the Project Alpha and Project Bravo site (paragraphs 15.50-15.53 and 15.76 to 15.78 respectively). For both sites the activity was low. Recreational vessels are moving through the area and as such as temporary receptors with regard to noise. As such a quantitative assessment of airborne noise has been scoped out from this ES.
East Lothian Council	Noted that the landfall in its current location does not affect East Lothian, however this could occur if it was relocated. Noted due to the location of the Phase 1 sites (Project Alpha and Project Bravo) being some 60km from the East Lothian coast no significant visual effects are expected.	The landfall position is near to Carnoustie in Angus and hence the opinion of East Lothian Council remains as stated.
Fife Council	Noted the presence of leisure sailing ports such as Anstruther and Tayport harbour. Mention of the Port of Methil and Burntisland should be referred to with regard to construction and maintenance.	Recreational sailing is assessed in Chapter 15: Shipping and Navigation of this ES. This chapter identifies potential support bases for construction, maintenance and supply chain activities however no commitment to facilities can be made at this stage of the development and procurement process.

POLICY AND GUIDANCE: SOCIO-ECONOMICS

19.9. Detail on policy relating to the Seagreen Project is contained in Chapter 4: Legislation Policy and Guidance of this ES. In the case of socio-economic impacts it is relevant to highlight any specific guidance and policy that is directly relevant to the scope and assessment of the socio-economic impacts.

19.10. There is no specific statutory guidance for the assessment of socio-economic impacts within the EIA Regulations, however the following non statutory documents and guidance have been considered in undertaking this assessment:

- Guidelines for Environmental Impact Assessment (IEMA, 2004); and
- A Handbook for Environmental Impact Assessment (SNH, 2009).

19.11. The relevant policies and action plans from the UK and Scottish Government highlighting the important of offshore industry and key considerations have been identified in the following documents:

UK Policy

The UK Renewables Energy Strategy (HM Government, 2009)

19.12. The UK Renewable Energy Strategy (UKRES) strategy sets out the UK Government's mechanism for delivering large-scale renewable energy targets. The primary target is for 15% of the UK's energy to be sourced from renewable energy by 2020. In comparison the Scottish Government has set an 80% target for the same date. The UKRES acknowledges the massive resource potential from offshore wind generation as one of the largest in Europe as well as detailing how best it can be exploited.

19.13. The UKRES acknowledges the requirement for the UK to significantly increase its use of renewable energy. The key drivers for this are:

- the necessity to combat climate change by way of a radical reduction of greenhouse gas emissions; and to reduce dependence on foreign energy which have occurred as a result of our declining national oil and gas assets.

Scottish Policy

A Low Carbon Economic Strategy for Scotland – A Low Carbon Society (Scottish Government, 2010)

19.14. The Low Carbon Economic Strategy was created in order to institute the policy direction for Scotland's "*key low carbon economic opportunities and strengthen business confidence in exploiting low carbon opportunities*". To enable this transition the document set out the following general approaches to deliver these objectives:

- the global economic opportunities that will arise in making the transition to a low carbon economy;
- the drivers and barriers to the development of these opportunities and growth of the low carbon economy; and
- the role of government, and wider public sector in supporting business to overcome the barriers.

19.15. The Low Carbon Economic Strategy for Scotland identified offshore wind developments as an opportunity to build on the existing skills base in Scotland to develop low carbon skilled workers building on engineering experience in offshore projects.

National Planning Framework for Scotland 2 (NPF2) (Scottish Government, 2009)

19.16. The NPF2 acknowledges that the Scottish Government is "*committed to realising the power generating potential of all renewable sources of energy*." While recognising that the development of onshore wind farms has been moving forward quickly, the longer-term potential for large scale renewable energy schemes are likely to move towards new technologies such as wave and tidal power, biomass and offshore wind.

19.17. The Framework clearly states that the "*Government is committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term*." In addition it the NPF2 highlights that the Government is supportive of a wide assortment of renewable energy technologies, with growing involvements from offshore wind, wave, and tidal energy, along with greater use of biomass. The objective of the NPF2 is to advance Scotland's renewable energy potential whilst protecting the environment and local communities. The NPF2 recognises the Firths of Tay and Forth as locations with potential for the development of offshore wind farms.

Scottish Planning Policy (SPP): A Statement of the Scottish Government's Policy on Nationally Important Land Use Planning Matters (Scottish Government, 2010a)

19.18. The SPP is a statement of the Scottish Government's policy on land use planning including, amongst other things, purpose of planning, core principles and objectives of the system, sustainable development and planning policies on the implications for development planning and development management.

19.19. It is recognised within the SPP in Section 92 that offshore renewable energy generation has the capacity to contribute significantly to the Government's renewable energy targets. The SPP states that while the terrestrial planning system does not regulate off-shore wind energy development, it is still important to take into account the various infrastructure and grid connection prerequisites required for off shore wind energy development. In addition the SPP acknowledges that development plans need to identify suitable locations for services associated with the manufacture, installation, operation and maintenance of offshore wind farms. Comment on this is made in paragraphs 19.25 to 19.24 below relating to Local Policy.

Scotland's Offshore Wind Route Map: Developing Scotland's Offshore Wind Industry to 2020 (Scottish Government, 2011)

19.20. 2020 Routemap for Renewable Energy in Scotland reflects the challenge of the Scottish Government's new target to meet an equivalent 100% demand for electricity from renewable energy by 2020, as well as the target of 11% renewable heat. It presents actions which are focused on targets within the current development of UK regulatory support.

19.21. The routemap recognises that offshore wind energy developments have huge scope for sustainable economic growth in Scotland. It recognises that there must be support for innovation in order to reduce the costs of offshore wind development.

National Renewables Infrastructure Plan (N-RIP) Stage 2 (Scottish Enterprise/Highland and Islands Enterprise, 2009)

19.22. 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'.

19.23. 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 Forth/ Tay and Moray areas. 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.

Local Policy

19.24. This application relates to the consenting off the Seagreen Project which contains the offshore wind farms Project Alpha and Project Bravo, and the associated offshore transmission works. As such local planning policy is of limited applicability to this application and will be covered extensively in the application for the Onshore Phase I Transmission Project to be submitted under the Town and Country Planning regime.

19.25. Local policy and development plans can assist a local authority in developing the infrastructure to support the supply chain for offshore wind developments. As identified in the introduction to this chapter, decisions on the procurement and sourcing of construction and maintenance support for the Seagreen Project are yet to be made and hence no solid conclusions can be drawn on the specific contributions of the Seagreen project against these development plans.

Assessment Methodology

19.26. This section provides an overview of the study areas used for the socio-economic and the tourism and recreation assessment and confirms the sources of data used for collection of data for each assessment. It then sets out the terms used and provides a definition for each assessment.

Study Area: Socio- Economic Assessment

19.27. With regard to the economic assessment of expenditure and supply chain associated with the Seagreen Project, the potential impacts may influence a wide area. As stated in the Scoping Report (Seagreen, 2010) a proportion of the expenditure may add to local, regional and UK-wide income during the construction phase. Expenditure on key elements of the wind farms, such as wind turbines, will result in further expenditure throughout the supply chain for component parts (e.g., lubricants, paints) and other services (e.g., hotel facilities, catering, security). As such, direct expenditure will be re-circulated as (indirect) expenditure to other companies; this is commonly referred to as the multiplier effect.

19.28. The Study Area considers the potential impacts on the local, regional and UK-wide economy. Specific consideration is given to the Local Authority areas in the vicinity of the Seagreen Project namely Fife, Angus, Dundee and East Lothian (Seagreen, 2010). While it is considered that there will be some procurement of goods and services from overseas which will also result in beneficial impacts at the international level these are not within the scope of this assessment in accordance with the approach agreed with Marine Scotland.

Study Area: Tourism and Recreation

19.29. The impact on land based tourism and recreational receptors from the Seagreen project is associated with the visual impact or disturbance during construction, primarily associated with the landfall location.

19.30. This chapter utilises the findings of the SLVIA in the assessment and hence the Study Area with regard to the visual impacts on tourism and recreation is the same as the SLVIA. Chapter 16: Seascape, Landscape and Visual Impact Assessment (SLVIA) of this ES, defines an initial Study Area of 50km for the assessment of impacts. Outside of this Study Area it was determined significant seascape, landscape and visual impacts were unlikely to occur. Within this Study Area the SLVIA identified receptors which have been assessed with regard to Project Alpha and Bravo. The assessment included consideration of tourist attractions. With regard to the landfall location, the potential for impacts on tourism and recreational receptors is associated with temporary disruption during construction. As such the Study Area has been defined as being within the red line which extends up to MHWS. The construction impacts and all aspects of the project above MLWS will be considered as part of a separate application and ES which will be submitted to Angus Council.

Data Collection and Survey

19.31. In order to assess the potential impacts on socio-economic and tourism and recreational receptors data has been sourced from the following organisations:

Socio-Economics:

- Angus Council;
- Dundee City;
- Fife Council;
- East Lothian Council;
- The Crown Estate;
- Industry publications as referenced throughout this chapter;
- National Statistics Online (www.statistics.gov.uk);
- NOMIS Labour Market Statistics (www.nomisweb.co.uk); and
- Statistics from the Annual Population Survey 2010 (Scottish Government, 2011).

Recreation and Tourism:

- Visit Scotland (www.VisitScotland.com);
- SNH (Tyldesely D. And Associates 2009);
- Glasgow Caledonian University (2008); and
- Ordnance Survey.

19.32. Desk based data obtained through this data collection process, along with guidance and documents used within the assessment are referenced throughout this chapter. A full list is provided in the reference section at the end of this chapter.

APPROACH TO ASSESSMENT: SOCIO-ECONOMICS

19.33. During the application preparation process, discussions were held with Marine Scotland to determine the assessment methodology with regard to socio-economic impacts. It was agreed between Marine Scotland and Seagreen that a matrix approach to defining magnitude, sensitivity and therefore significance would not be applied in relation to socio-economic impacts. As such the assessment method for socio-economic impacts differs to that presented in Chapter 6: EIA Process of this ES. The reason for this decision relates to the subjectivity of defining specific categories of sensitivity and magnitude to the likely socio-economic impacts of the Seagreen Project at this stage in the development process.

19.34. For the purposes of this assessment the definitions which are used for assessing the magnitude of impacts on socio-economic are set out in Table 19.2 below.

Table 19.2 Definition of terms relating to the magnitude of socio-economic impacts

Magnitude	Definition
Major	A fundamental change to a location, environment or sensitive receptor or in breach of recognised legislation, policy or standards.
Moderate	A material, but non-fundamental change to a location, environment or sensitive receptor.
Minor	A detectable but non-material change to a location, environment or sensitive receptor.
Negligible	Either no change or no detectable change to a location, environment or sensitive receptor.

19.35. For assessing significance, consideration is given to the national, regional and local baseline situation. The magnitude of the impact is determined in the proportion to the area of impact relevant to each receptor. For the purpose of the assessment, a moderate or major impact is deemed to be 'significant' (SNH, 2009).

19.36. As socio-economic impacts of the Seagreen Project are generally beneficial, the worst case in terms of socio-economic impacts would be that the Seagreen Project did not proceed; a scenario that is identical to the baseline. As such the worst case is not presented in this chapter, and instead a 'best estimate' approach has been used to assess a likely realistic scenario.

19.37. The socio-economic impacts of the Seagreen Project are assessed in the following sections utilising the anticipated expenditure based on published industry figures, and conclusions drawn in a qualitative manner. This is considered to be appropriate for a 'best estimate' approach to beneficial impacts given the uncertainty in project parameters at this stage.

19.38. Impacts are defined as:

- beneficial or adverse;
- short or long term; and
- direct or indirect.

19.39. For the purposes of the socio-economic assessment where the term Project Alpha and Project Bravo are used, this refers to the entire infrastructure associated with those projects as industry guidance does not provide a mechanism for assessing the wind farm elements and transmission project elements separately.

19.40. The assessment does not specifically include a definition of the confidence of the impact prediction. As stated above the socio-economic assessment is based on the anticipated expenditure of the project which has been estimated from industry guidance on the £/ MW relating to offshore wind as set out in paragraph 19.44 below. As the actual expenditure for the project is not known accurately at this stage, and the procurement decisions on where expenditure will be made have not yet been taken, confidence in the precision of the impact magnitude prediction is reduced. It can however be stated that for all socio-economic impacts the likelihood of all impact occurring is high, in the event the project receives consent and is developed as outlined in Chapter 5: Project Description of this ES.

19.41. In summary, all socio-economic impacts have a high likelihood of occurring in the event that the project gains consent and is developed; however, the confidence in predictions of the magnitude of the impacts is low as this is based on estimated expenditure from industry publications.

19.42. The socio-economic impact assessment assess the following impacts as introduced in the Scoping Report (Seagreen, 2010, Appendix B1 in ES Volume III) and as suggested as appropriate by the policy and guidance outlined in this chapter:

- capital expenditure and supply chain; and
- employment: direct and indirect employment.

Defining the Assessment

19.43. The extent of the project expenditure is not yet known accurately, and hence this has been estimated based on published sources applicable to the offshore wind industry. The capital expenditure costs of developing and constructing an offshore wind farm are estimated to be around £3m per MW (BVG Associates, 2011). The report predicts variation in the capital expenditure going forward ultimately leading to a reduction in the capital expenditure for projects developed in 2019-2020 associated with economies of scale. This assessment has been based on £3m per MW for the capital expenditure.

19.44. Project Alpha and Bravo each have a maximum output of 525 MW. As such the predicted expenditure is £1,575m per project. This would correspond to an expenditure of £3,150m for the Seagreen Project. To ensure the assessment is based on a realistic estimate, rather than an optimistic basis, it has been assumed that the total capital expenditure will be 75% of this value per project i.e. £1181m, and 50% of the total capital expenditure i.e. £1575 for the Seagreen Project. The difference in percentages is because in reality should both Project Alpha and Project Bravo progress the expenditure will be less as there will be shared costs associated with the export cable and grid connection infrastructure. It is not possible at this stage to accurately assess the level of expenditure for this scenario hence the assumption of 50% expenditure. If actual expenditure is higher than this, socio-economic impacts will be more beneficial than as assessed within this chapter.

19.45. With regard to the likely number of construction employees, this assessment utilises information from the Office of National Statistics: Construction Statistics Annual 2011 (ONS, 2011).

19.46. Operating expenditure is estimated to be £98,000 per MW per annum (BVG Associates, 2011) in 2011-2014, decreasing with time to £75,000 per MW per annum in 2019-2020. The Seagreen Project is expected to be operational from 2019 and hence the £75,000 per MW per annum figure is relevant. The anticipated operational lifespan of the project is 25 years.

19.47. The number of employees required for the construction and operation and maintenance (O&M) phases cannot be accurately quantified at this stage of the development process.

19.48. However there are Industry reports (Oxford Economics, 2010) which provide an estimate of the likely O&M employees per MW for offshore wind. This report predicts a likely scenario of 0.19 direct O&M jobs created per MW for offshore wind in the UK. This translates to approximately 100 O&M jobs for both Project Alpha and Project Bravo, and therefore approximately 200 O&M jobs for the combined Seagreen Project.

19.49. Information on the likely number of O&M employees is stated in Chapter 5: Project Description of this ES which presents a range of between 95 and 140 O&M employees for each OWF project. In addition to above there will be core operations staff based at an onshore O&M base to manage and support all aspects of wind farm operation. They are expected to number approximately 40 personnel in total, this gives a range of 135 to 180 operational personnel for each OWF project. These estimated employment numbers are above the predicted industry guidance (Oxford Economics, 2010). As there is uncertainty in the employment numbers for O&M, the industry standard numbers calculated above have been used in this assessment.

19.50. The location of expenditure and employment cannot be accurately determined at this stage as this will depend on the location of contractors able to supply the project which will in turn be linked to other offshore developments progressing at the time.

APPROACH TO ASSESSMENT: TOURISM AND RECREATION

19.51. There are no guidelines for assessing the potential effect of offshore wind farm projects on tourism and recreation. 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.

19.52. The assessment method for recreation and tourism impacts is based on that defined in Chapter 6: EIA Process of this ES. Sensitivity and magnitude are defined and combined to provide a level of significance. A definition of sensitivity and magnitude are provided in Tables 19.3 and 19.4 below.

Table 19.3 Definition of terms relating to the sensitivity different tourist attractions

Value / Sensitivity	Value	Sensitivity
High	Nationally important / rare with limited potential for offsetting / compensation. Recognised nationally important popular tourism or recreational destination.	Feature / receptor has no or very limited capacity to accommodate the proposed form of change.
Medium	Regionally important / rare with limited potential for offsetting / compensation. Sites identified as important for future tourism. Other attractions, e.g. parks and garden and historic sites, highly valued recreational resources.	Feature / receptor has limited capacity to accommodate the proposed form of change.
Low	Locally important / rare. Sites of relevance to tourism and recreation but not an attraction in their own right.	Feature / receptor has some tolerance to accommodate the proposed change.
Negligible	Not considered to be particularly important / rare. Sites with limited or no tourism or recreation attraction	Feature / receptor is generally tolerant and can accommodate the proposed change.

Table 19.4 Definition of terms relating to the magnitude of impact for different tourist attractions

Magnitude	Definition
High	Fundamental, permanent / irreversible changes, over the whole feature / asset, and/ or fundamental alteration to key characteristics or features of the asset's character or distinctiveness.
Medium	Considerable, permanent / irreversible changes, over the majority of the feature / asset, and/ or discernible alteration to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Low	Discernible, temporary (throughout project duration) change, over a minority of the feature / asset, and/ or limited but discernible alteration to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Negligible	Discernible, temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area of the feature or asset, and/ or slight alteration to key characteristics or features of the particular environmental aspect's character or distinctiveness.
No change	No loss of extent or alteration to characteristics, features, or elements.

19.53. The sensitivity and magnitude are combined to produce a level of significance as shown in Table 19.5.

Table 19.5 Significance matrix

Value / Sensitivity	Magnitude			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

19.54. Impacts of moderate or major significance are defined as significant in terms of the EIA Regulations.

Defining the Assessment

19.55. With regard to impacts on recreation and tourism, the Seagreen project impacts can either be:

- Direct: Physical disruption to recreational activities (note this excludes recreational sailing as this has been assessed in Chapter 15: Shipping and Navigation) such as prohibiting access to footpaths, rights of way, beaches etc.; or
- Indirect: Visual impacts from key tourist and recreational destinations – note these may be positive or negative based on the perception of the visitor.

19.56. Physical disruption to recreational activities may include exclusions zones in place during construction or operational phases. The effects on recreational sailing have been assessed in Chapter 15: Shipping and Navigation of this ES and hence the assessment in this chapter considers the construction phase impacts associated with the Export Cable Route (ECR) corridor at the landfall. The works on the Transmission Asset Project within the ECR corridor would occur at one time period, irrespective of whether Project Alpha and Project

Bravo progress separately or concurrently and hence the assessment is made only for the Seagreen Project. Direct impacts associated with the onshore transmission works project are assessed in the separate ES. In the event decommissioning activities involve the removal of the export cable at the landfall point this would take less time than that of the construction process and hence any impact would be less. As such no separate assessment of decommissioning has been presented here.

19.57. With regard to indirect i.e. visual impacts, Chapter 16: SLVIA of this ES does not identify any significant impacts during the construction phase of Project Alpha and Project Bravo (excluding the Transmission Asset Project) and hence the impact on recreation and tourism receptors as a result of these activities has been scoped out of this assessment. The construction phase for the Transmission Asset Project was found to have potentially significant impacts on a temporary basis however these activities are greatly limited in spatial extent compared to Project Alpha and Bravo. As such the focus of this assessment is on the operational phase indirect impacts on tourism and recreational resources.

EXISTING ENVIRONMENT: SOCIO-ECONOMICS

19.58. The scope of the socio-economic assessment relates to potential impacts which may occur on a local, regional and UK wide scale. The assessment will give regard to potential impacts associated with the expenditure and employment. As it has been reiterated throughout this chapter, the details on the expenditure, location of supply chain activities and contract decisions are yet to be made. As stated in the Scoping Report (Seagreen, 2010), specific consideration will be given to the local populations in the vicinity of the Seagreen Project i.e. Fife, Dundee, Angus and East Lothian.

19.59. This section therefore presents an overview of the socio-economic status of these local areas. Data on Scotland is also provided to provide a basis for assessment of impacts over a larger geographical study area.

19.60. The socio-economic baseline for this assessment focus on the following aspects:

- employment and education;
- expenditure; and
- supply chain opportunities.

Employment Characteristics

19.61. This section provides information on the employment characteristics of the local areas in the vicinity of the Seagreen project, Dundee, Fife, East Lothian and for the larger Study Area of Scotland.

19.62. Table 19.6 identifies the population figures including the population of working age for the key areas of study.

19.63. As shown by Table 19.6 the four local areas show little variation in the percentage of the population which comprises working age groups, that closely follows the pattern for Scotland as a whole.

19.64. The population of Fife is substantially greater than that of the three other local administrative areas.

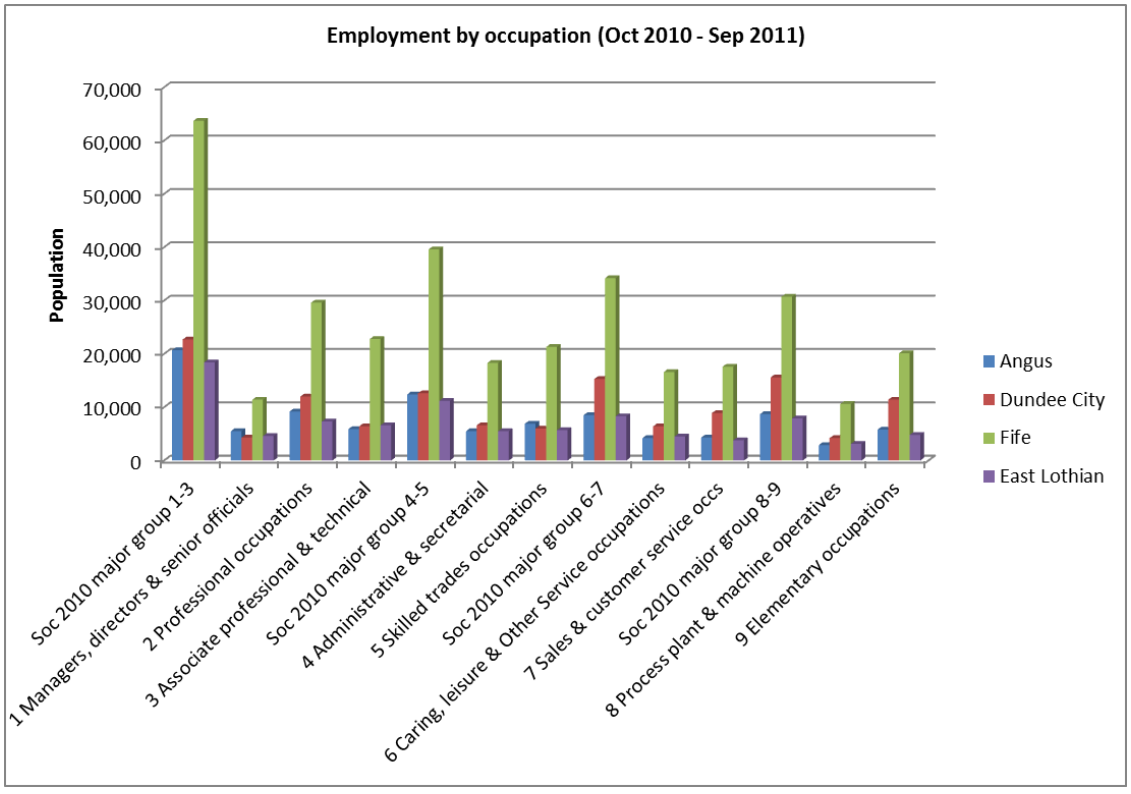
Table 19.6 Population figures (2011)

	Angus	% of total pop.	Dundee	% of total pop.	East Lothian	% of total pop.	Fife	% of total pop.	Scotland	% of total pop.
Total Population	110630	100	145570	100	98170	100	367370	100	5254800	100
Males (all ages)	53684	49	69453	48	47149	48	177347	48	2548200	48
Females (all ages)	56946	51	76117	52	51021	52	190023	52	2706600	52
Children 0 to 15	19470	18	24086	17	18868	19	65003	18	913317	17
Working age 16 to 64 (male)	33048	30	46231	32	29760	30	115591	31	1697878	32
Working age 16 to 64 (female)	34738	31	49661	34	31660	32	118334	32	1751218	33

Source: General Register Office for Scotland: Mid – 2011 Population Estimates Scotland (31 May 2012)

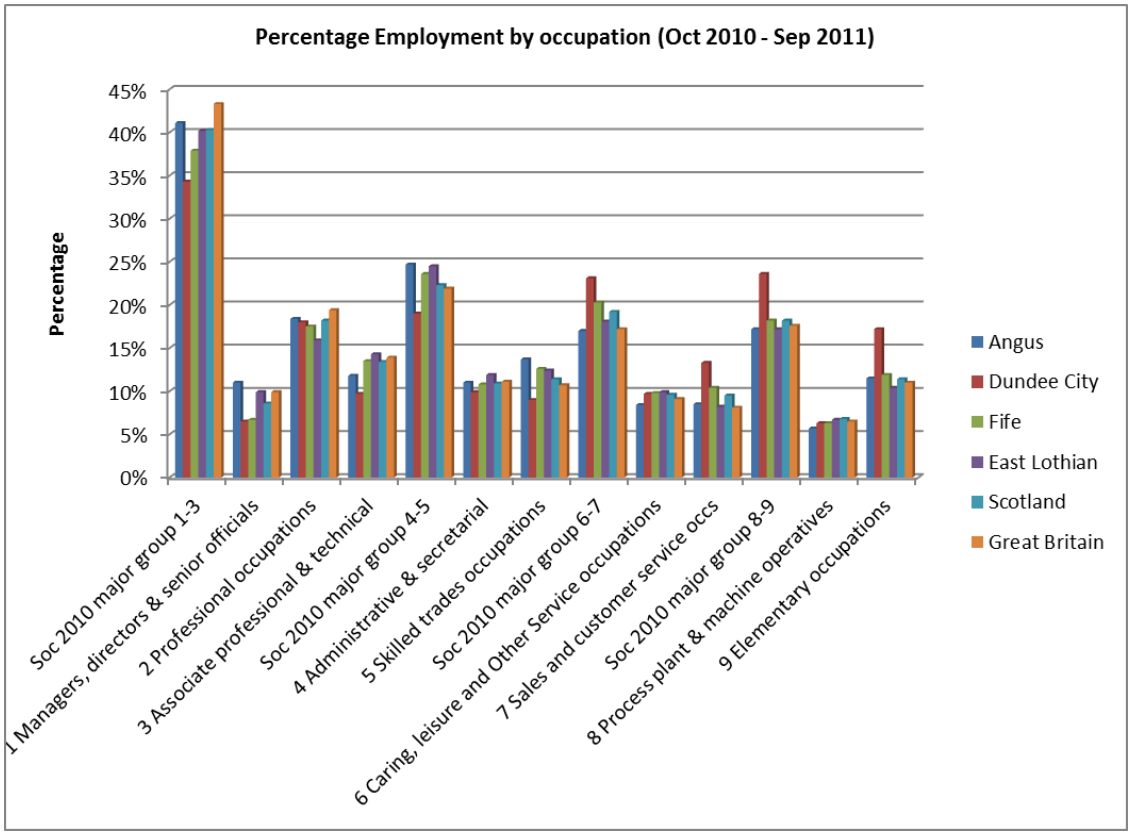
19.65. A review of the Official Labour Market Statistics (www.nomis.co.uk) was undertaken to identify key employment characteristics of the four local areas compared with Scotland and Great Britain. Appendix M1 contains the raw data table from the data search which is summarised and discussed below. Plots 19.1 and 19.2 illustrate the employment split within the four local authority areas, Scotland and Great Britain.

Plot 19.1 Angus, Dundee, Fife & East Lothian - Employment by Occupation



Source: ONS NOMIS annual population survey (www.nomis.co.uk)

Plot 19.2 Angus, Dundee, Fife, East Lothian, Scotland and Great Britain - Employment by Occupation



Source: ONS NOMIS annual population survey (www.nomis.co.uk)

19.66. The key points from Plots 19.1 and 19.2 are:

- Angus: The largest proportion of employees in Angus is employed in socio economic groups 1-3 (Managerial and Professional); this percentage is higher than the other three local administrative areas and the Scotland average. It is slightly below that of Great Britain;
- Dundee: The largest proportion of the employees in Dundee are employed in socio economic groups 1-3 (Managerial and Professional) however of the four local administrative areas considered this represents the lowest percentage in this group and it is below the Scotland and Great Britain percentage for this group;
- Fife: Fife has the largest population of the four local administrative areas and the highest number of employees in all categories. Fife does not have the highest percentage of employees in any socio-economic group compared against the other local administrative areas. Within Fife the highest percentage of employees are employed groups 1-3 (Managerial and Professional); and
- East Lothian: The East Lothian employment distribution is similar to that of Scotland and Great Britain in terms of percentages across socio-economic groups. The highest percentage of employees within East Lothian is employed in socio-economic group 1-3 (Managerial and Professional).

19.67. Data on employment and unemployment in the local administrative areas, Scotland and Great Britain is shown in Plot 19.2 (Appendix M1). Of the four local administrative areas Fife has the largest population and workforce; however, as shown in Plot 19.2, East Lothian has the highest percentage of the population in employment. Angus, Fife and East Lothian all have a higher percentage than the Scotland and Great Britain wide percentage in employment.

19.68. The Regional Labour Market Statistics (ONS, June 2012) state within Scotland the total in employment in February to April 2012 was 2,463,000, representing 57.97% of the population. Of these 169,000 were employed in the construction industry and 19,000 in electricity, gas, steam & air conditioning supply.

Education

19.69. Appendix M1 contains baseline data and illustrations (see Plots 3 and 4 in Appendix M1) on educations status including consideration of population with no or low qualification, NVQ or degree level qualifications.

19.70. East Lothian has the highest percentage of the population with no or low qualifications and this is similar to the Scotland wide percentage. Angus, Dundee and Fife all have percentages below that for Scotland. In all the local administrative areas the percentage of the population with no or low qualifications is decreasing, this is also the case for the Scotland wide dataset.

19.71. Angus has the highest percentage of both NVQ 4 or above, and degree qualified persons of the four local administrative areas. This is also higher than the percentage NVQ 4 and above for Scotland and Great Britain, and the percentage of degree qualifications for the population of Scotland. Of the four local administrative areas Fife has the lowest percentage of the population with degree qualifications however it has the highest percentage of NVQ 1 or above qualifications.

Expenditure

19.72. The Gross Value Added (GVA) is a key indicator used to measure economic performance. GVA for the UK was £1,255 billion in 2009 (Office of National Statistics, 2010) and £102 billion for Scotland (Office of National Statistics, 2010).

19.73. All of the four local administrative areas have seen a decline in growth from approximately the year 2006 in terms of GVA. A breakdown of the data for each area is provided in Plots 5-7 of Appendix M1.

19.74. In general this is due to a drop in sectors such as construction, real estate, transport, accommodation & food markets, with sectors such as public administration, education & health, finance & insurance activities accounting for growth.

19.75. The earning by resident in term of GVA per head in the four local administrative areas is all below the UK and Scottish averages as shown in Plot 8 of Appendix M1. Angus & Dundee have the highest GVA level with Clackmannanshire & Fife next followed by East Lothian & Midlothian. The growth in earnings have all slowed since 2007 and started to fall in 2008 a pattern that is repeated across the country.

Economy – Supply Chain Opportunities

19.76. Within the four local administrative areas there are several locations which have been identified as key locations for the future in terms of supporting the offshore renewable supply chain. It is beyond the scope of this ES to identify and assess impacts down the supply chain for the offshore renewable sector, however, it is considered relevant to the explanation of the existing environment to provide a brief introduction.

19.77. An announcement was made in January 2012 that Dundee and Leith Ports were awarded enterprise area status by the Scottish Government under the new Renewable Energy Enterprise East Area umbrella. As such, the ports will be able to offer incentives to companies that agree to invest here. Prior to this in December 2011 there was an announcement that "*a memorandum of understanding is signed between Perth based Scottish and Southern Electricity (SSE), Dundee City Council, Forth Ports and Scottish Enterprise to work together to attract offshore wind suppliers to the city*" (www.scottish-enterprise.presscentre.com).

19.78. The March 2012 economic profile bulletin for Fife highlighted the following development opportunities. Rosyth – Development of the Rosyth Waterfront, including the expansion to freight capacity and upgrades to road and rail links, will enhance the area's ability to attract new companies and investment. Construction of the HMS Queen Elizabeth and HMS Prince of Wales aircraft carriers at Rosyth will continue to provide employment opportunities in the next few years. Forth Bridgehead – construction of the replacement Forth Crossing commenced in late 2011, creating significant opportunities for local firms and contractors. Second phase £16 million investment for the Fife Energy Park has been approved, including new quayside facilities. Development of the Methil Low Carbon Investment Park, a satellite site for the energy park, will also commence in 2012. Funding towards the development of a Low Carbon Investment Park in Levenmouth, which will complement the Fife Energy Park has also been secured.

19.79. The policy section of this chapter outlined a key conclusion from the N-RIP (Scottish Enterprise, 2009) which states that "*Based on offshore Project developer feedback and SDI's enquires; most interest is being shown in sites in the Forth/Tay and Moray*" (Scottish Enterprise, 2009). As such, investment into infrastructure to support the offshore supply chain is likely to be focussed in the region.

19.80. The Firth of Forth and surrounding areas have a range of existing infrastructure which could be adapted to support the offshore renewable sector. Of note include facilities such as the Port of Methil and Burntisland. This region is already linked to offshore renewable supply chain through the operations of Bi-Fab, a jacket substructure manufacture and are likely to a be a focus of further opportunities to support Scotland, UK and European offshore projects.

EXISTING ENVIRONMENT: TOURISM AND RECREATION

19.81. For both direct and indirect impacts the Study Area falls predominantly within the areas of Angus and Dundee. For indirect impacts there is also potential for limited impacts in Aberdeen City and Shire and The Kingdom of Fife however these are further from the Seagreen Project and hence the potential for indirect impacts is less.

19.82. Table 19.7 below shows a comparison of the visitor numbers for these regions within the study area again that for the rest of Scotland.

Table 19.7 Annual visitor figures (2010)

Region	Total Tourists from UK (million)	% of Visitors to Scotland	Total Tourist from Overseas	% of Visitors to Scotland
Scotland	12.37	100	2.35	100
Angus and Dundee	0.51	4.12	0.07	2.98
Abderdeen City and Shire	1.12	9.06	0.17	7.23
Kingdom of Fife	0.57	4.61	0.12	5.12

Source: Visit Scotland

19.83. Scottish Natural Heritage (SNH) commissioned LUC to undertake a survey to develop a better understanding of current and future recreational activity in the marine and coastal environment in Scotland (SNH/ LUC, 2007), and to identify any marine and coastal areas of particular importance for recreation. The survey found that almost the entire coastline and most of the waters around Scotland were of importance for some form of recreation.

19.84. The survey identified that 87% of all reported visits to the coast were day trips with the location of choice dependent on the quality of the coastal environment. The Firth of Tay is the most relevant area identified in the SNH/ LUC (2007) report with regard to the study area for direct impacts from the Seagreen Project. This area was not identified as in the most important regions in Scotland for informal recreation, specialist recreation or specialist recreational activities. The Firth of Tay was ranked 11 out of the 16 areas surveyed for informal recorded recreational sites, 16 out of 16 for specialist recreational promoted sites, and 8 out of 16 for specialist recorded recreational sites.

19.85. With regard to indirect impacts the majority of the Study Area also falls within the Firth of Tay, however the Study Area also includes the Firth of Forth and East Grampian Coast as identified in the SNH/ LUC (2007) report. The Firth of Forth was ranked 4 out of 16 areas for informal recorded recreational sites and specialist recreational promoted sites, and 6 out of 16 for specialist recreational recorded sites. The East Grampian Coast was ranked 5 out of 16 for informal recorded recreational sites, specialist recreational promoted sites and specialist recreational recorded sites

Existing Environment: Direct Impacts

19.86. As stated in Study Area - Socio Economic Assessment above (paragraphs 19.33 to 19.34), the study area with regard to the direct impacts of the Seagreen Project is that within, or immediately adjacent to the ECR corridor. The ECR corridor landfall point is located at Barry Sands, south of Carnoustie Bay, Angus. The Angus coastline is known for its beaches and golf courses (VisitScotland.com). The golf courses such as Carnoustie attract visitors on an international scale.

19.87. There a various beaches which are both visitor and recreational attractions within the region of the ECR corridor including:

- Barry Sands (within the ECR corridor); Carnoustie Bay (adjacent to the ECR corridor);
- Monifeith;
- Lunan Bay;
- Montrose Bay;
- Arbroath Beach; and
- Tentsmuir.

19.88. Lunan Bay is a renowned regional coastal attraction with one of the largest expanses of sand in the Angus region. The beach is popular with visitors for day trips and from a recreational perspective is used by surfers (VisitScotland.com). Tentsmuir and Monifieth are valued wildlife resources supporting large populations of birds and, in the case of Tentsmuir, seals. The beaches also represent valued recreational and tourism resources for day visitors.

19.89. The ECR corridor landfall point is at Barry Sands south of Carnoustie Bay. Barry Sands and the southern extent of Carnoustie Bay have the potential to be directly impacts by the construction phase of the Seagreen Project. The southern area of the Barry Sands has restricted access due to the Ministry of Defence (MOD) rifle range located in the area. Carnoustie Bay to the north of the ECR corridor is identified as an area for suitable for "*swimming, sailing, windsurfing and fishing*" (VisitScotland). The bay is also used sea kayaking and surfing.

19.90. The direct impact associated with the Carnoustie golf course is assessed in the ES for the Onshore Phase I Transmission Project and hence is not considered further here with regard to direct impacts.

Existing Environment: Indirect Impacts

19.91. Chapter 15: SLVIA of this ES identifies and assesses recreational and tourism receptors with the potential to be impacted by the Seagreen Project. The receptors are within the 50km study area of visual impacts. The SLVIA did not identify significant visual impacts beyond 35km of the Project Alpha and Project Bravo boundaries.

19.92. A review of the Zone of Theoretical Visibility (ZTV) was undertaken to identify the likelihood of receptors being within 35mk of Project Alpha or Bravo. The ZTV clearly marks the distance of 30km from the red line boundaries and shows for Project Alpha, only a small area of land is within 30km of the Project, and for Project Bravo, there are no land based receptors within 30km of the boundary. This is a large distance between the receptors and the Seagreen Project. The SLVIA has been undertaken under good weather conditions, it should be noted that under more challenging meteorological conditions the intervisibility of the receptors on land and the Seagreen Project will be much reduced.

19.93. Within the study area the SLVIA identified the following receptors of relevance to recreation and tourism:

- National Cycle Network 1 (NCN1), which extends along the Angus and Aberdeenshire coastline to Aberdeen;
- Fife Coastal Path which runs throughout the Fife coastline from Largo Bay to Tayport;
- several golf courses including Stonehaven Golf Club in Aberdeenshire, Montrose Golf Links, Arbroath Golf Links and Carnoustie Golf Links, in Angus, and the Crail Golfing Society in Fife;
- beaches including St Cyrus, Arbroath, Lunan Bay, Elliot, East Haven, Carnoustie, Barry Sands North, Buddon Sands, Cambo and Balcomie;
- settlements with hotels, cafes, bars and tourist shops as well as specialist attractions such as museums and visitor centres;
- Wairds Park Caravan Site and East Bowstrips Caravan Park to the north of Montrose, and Seaton Estate Holiday Village in Arbroath; and
- elevated vantage points along the coastline which offer views out to the sea.

Public Attitudes towards Wind Farms

North Hoyle Offshore Wind Farm—2nd Public Attitude Survey

19.94. 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.

19.95. A similar survey had been carried out by RBA in March 2003, before the wind farm was constructed, and this provided a baseline.

19.96. 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. 5% of 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.

19.97. 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).

19.98. The sea view is as important to residents now as it was before the wind farm was in position; 34% of residents say it is a main reason for them living in the area (52% of visitors say it is a main reason for them visiting the area).

19.99. These studies highlight the varying opinions of visitors and residents regarding wind energy development; however they suggest in all cases, that the majority of those surveyed do not have a negative attitude towards wind farms.

Receptor Sensitivity

19.100. The sensitivity of the receptors identified above to direct and indirect impacts is identified in Table 19.8 below. This has been determined from a balance of the value and sensitivity to change as outlined in Table 19.5. The value of the receptor maybe high in terms of the site being a nationally important tourism resource such as a golf club, however, the sensitivity to change maybe low as the surveys have shown there to be no evidence to suggest a view of an offshore wind farm has a detrimental impact on visitors. This would give an overall sensitivity of medium for that receptor.

Table 19.8 Sensitivity of Recreational and Tourism Receptors

Receptor	Comments	Sensitivity
Direct Impacts		
Barry Sands	Value: Low Beach of local importance. Site is used for some tourism and recreation but is not noted as one of the most important beaches in the region. Access is limited due to MoD. Alternative beaches of higher value are located nearby. Sensitivity: High Limited capacity to deal with the change.	Medium
Carnoustie Bay	Value: Low Beach of local importance. Site is used for some tourism and recreation but is not noted as one of the most important beaches in the region. Alternative beaches of higher value are located nearby. Sensitivity: High Limited capacity to deal with the change.	Medium
Indirect Impacts		
National Cycle Network 1	Value: High Nationally important cycle route. Represents destination in its own right for specialist visitors. Sensitivity: Low Users have a high capacity to tolerate change.	Medium
Fife Coastal Path	Value: Medium Regionally important recreational route. Sensitivity: Low Users have a high capacity to tolerate change.	Low/ Medium

Receptor	Comments	Sensitivity
Golf Clubs and Links	Value: High/ Medium Facilities of local, regional and national significance as recreational destinations. Larger, renowned facilities generate visitor in their own right. Sensitivity: Low Users have a high capacity to tolerate change.	Medium
Beaches	Value: Low/ Medium Recreational and tourism facilities primarily for day visitors of regional or local importance. Sensitivity: Low Users have a high capacity to tolerate change.	Low
Settlements with tourist facilities	Value: Low/ Medium Local and regional destinations. Sensitivity: Low Users have a high capacity to tolerate change.	Low
Caravan parks	Value: Medium Regionally significant destinations Sensitivity: Low Users have a high capacity to tolerate change.	Low/ Medium
Seaview vantage points	Value: Low/ Medium Locally and regionally important. Sensitivity: Low Users have a high capacity to tolerate change.	Low

IMPACT ASSESSMENT: SOCIO-ECONOMIC IMPACTS

19.101. The following section assesses the potential impacts of the Seagreen Project on the key socio-economic receptors:

- capital expenditure and supply chain;
- employment: direct and indirect employment.

19.102. The assessment assesses Project Alpha and Project Bravo as individual projects. The projects are then assessed as a whole as the Seagreen Project. Assessment of the Seagreen Project with other developments is presented in the section Impact Assessment: Cumulative and In-Combinations Impacts of this chapter (paragraphs 19.153 to 19.164).

Capital Expenditure (CAPEX): Construction

19.103. As stated in paragraph 19.43 of this chapter, the expenditure of Seagreen Project elements has been calculated based on industry standard guidance and publications. Table 19.9 below summarises the expenditure which has been assumed for the purposes of this assessment.

Table 19.9 Estimated Expenditure for Project Alpha, Project Bravo and Seagreen Project

	MW	£m /MW	Estimated expenditure (£m)	% of estimated expenditure for assessment purposes*	Expenditure for assessment (£m)
Project Alpha	525	3	1575	75	1181
Project Bravo	525	3	1575	75	1181
Seagreen Project	1,050	3	3150	50	1575

*values have been reduced to provide an assessment of a reduced expenditure than is predicted based on industry guidance, and the value saving should Project Alpha and Project Bravo progress concurrently.

19.104. This CAPEX is associated with the various pre-operational costs of an offshore wind farm which include:

- Project: includes all the development and consenting actions up to the point of placing an order for the wind farm construction. This is includes project management and other technical services such as legal advice and engineering. The majority of this spend is related to the supply of highly skilled professionals from across Scotland and the UK, with some spend in overseas markets for specific expertise;
- Turbine: this is a supply cost associated with the purchase of the turbine up to the point of connection to the array cables. This does not include the transportation or installation of the turbines. This portion of the CAPEX will be allocated directly to the turbine manufacturer. No turbine manufacturers are currently based in the UK however plans are in place for manufacturing and pre-assembly facilities in Scotland and the rest of the UK prior to the construction and supply of the Seagreen Project;
- Foundation: the cost relates to the supply costs of the manufacture of the foundation and does not include transportation and installation. Dependent on the foundation type decided upon in the final design, there is potential for the foundations to be manufactured in Scotland, or the UK; Electrical: this includes supply costs of the OSPs and substations foundations, array cable, off and onshore export cables and onshore electrical infrastructure; and
- Construction: this includes the transportation of the wind farm components to a port, onshore preparatory works and offshore installation costs. This element of the CAPEX includes construction vessels and employee costs and hence accounts for the primary portion of the CAPEX for which there is the highest potential for direct benefit to local and regional economies (BVG Associates, 2011).

19.105. The BVG Associates report, Offshore Wind: Forecasts of Future Costs and Benefits (2011) provides an estimate of the breakdown of the total capital expenditure. This breakdown is summarised in Table 19.10 below which relates this to the anticipated spend for Project Alpha, Project Bravo and the Seagreen Project as presented in Table 19.9 above.

Table 19.10 Estimated Breakdown of Expenditure for Project Alpha, Project Bravo and Seagreen Project

	CAPEX (£m)	Project		Turbine		Foundation		Electrical		Installation	
		%	£m	%	£m	%	£m	%	£m	%	£m
Project Alpha	1181	4	47	40	472	19	224	14	165	23	272
Project Bravo	1181	4	47	40	472	19	224	14	165	23	272
Seagreen Project	1575	4	63	40	630	19	299	14	221	23	362

Percentages are based on those provided in BVG Associates (2011).

19.106. The distribution of the CAPEX resulting from Project Alpha, Bravo and the Seagreen Project will depend on a number of factors including:

19.107. The ability of local, Scottish and UK based companies to secure construction contracts including the development of specific industry skills; and

19.108. The establishment of supply chain facilities in local areas, Scotland or the UK. This would allow for the CAPEX associated with supply elements i.e. turbines, foundations and electrical infrastructure, to filter out into the relevant economies.

19.109. Procurement decisions relating to the Seagreen Project are yet to be made and hence the value of this CAPEX to the local administrative areas, Scotland and the UK can not be conclusively determined at this stage. Industry publications do however provide estimates of the possible retention of this CAPEX from offshore wind projects in Scotland and the UK under various scenarios associated with the development of the supply chain. To enable an assessment to be made these industry publications have been utilised below.

19.110. A report by IPA and Scottish Renewables (2010) identified four scenarios which presented a high and low case in terms of development of the supply chain to support offshore renewable projects in Scotland and Great Britain. Scenario A, being the high case and scenario D, being the lowest.

19.111. Scenario D has not been considered in this assessment as this scenario states developers do not take forward sites in deeper waters and rougher sea conditions in Scotland. Under this scenario the Seagreen Project would not proceed and hence there would be no change from the existing environment. As such the assessment has been based on a high case of Scenario A and a low case of Scenario C. These scenarios are outlined below:

- High Case: Scenario A – The full 10.6GW of available offshore wind sites in Scotland will be developed. This exploits all the opportunities has to offer including a turbine manufacturer setting up a base in Scotland, development if skills and port infrastructure. A significant supply chain market is developed.
- Low Case: Scenario C – Offshore wind sites are brought online at a similar rate to scenario A but the supply chain and wider industrial base does not develop. The majority of goods and services are imported.

19.112. The report provides estimated retention factors under each scenario regarding how much CAPEX would be retained within Scotland, or the Rest of Great Britain. These retention factors are presented in Table 19.11 below for the various expenditure categories.

Table 19.11 Retention Factors (%) for Project Expenditure in Scotland and the Rest of Great Britain

Expenditure Category	Scenarion A High Case (Scotland)	Scenarion A High Case (Rest of Great Britain)	Scenarion C Low Case (Scotland)	Scenarion C Low Case (Rest of Great Britain)
Project	50	20	20	0
Turbine	30	15	0	0
Foundation	50	40	20	0
Electrical	18.34*	5.84*	5*	0
Installation	28.34**	18.34**	11.67**	0

Source: IPA/ Scottish Renewables (2010) Scottish Offshore Wind: Creating an Industry

*calculated as an average from the retention factors for cable, substation and SCADA supply

** calculated as an average from the retention factors for installation activities (foundations and meteorological masts, turbines, and cable lay)

19.113. Tables 19.12 and 19.13 below applies these retention factors to the predicted expenditure presented in Table 19.11 Retention Factors to give the estimated expenditure in Scotland and the Rest of Great Britain under a high and low case scenario for Project Alpha and Project Bravo individually, and the Seagreen Project.

Table 19.12 Estimated Expenditure for Project Alpha, Bravo and the Seagreen Project under a High and Low Case Scenario - Scotland

	CAPEX (£m)	Project			Turbine			Foundation			Electrical			Installation			Total
High Case Scenario																	
	-	£m	Retention %	Expenditure £m	£m	Retention%	Expenditure £m	£m	Retention%	Expenditure £m	£m	Retention %	Expenditure £m	£m	Retention %	Expenditure £m	Expenditure £m
Project Alpha	1181	47	50.00	23.5	472	30.00	141.6	224	50.00%	112	165	18.34	30.26	272	28.34	77.08	384.45
Project Bravo	1181	47	50.00	23.5	472	30.00	141.6	224	50.00%	112	165	18.34	30.26	272	28.34	77.08	384.45
Seagreen Project	1575	63	50.00	31.5	630	30.00	189	299	50.00%	149.5	221	18.34	40.53	362	28.34	102.6	513.12
Low Case Scenario																	
	-	£m	Retention %	Expenditure £m	£m	Retention%	Expenditure £m	£m	Retention%	Expenditure £m	£m	Retention %	Expenditure £m	£m	Retention %	Expenditure £m	Expenditure £m
Project Alpha	1181	47	20.00	9.4	472	0	0	224	20.00	44.8	165	5.00	8.25	272	11.67	31.74	94.19
Project Bravo	1181	47	20.00	9.4	472	0	0	224	20.00	44.8	165	5.00	8.25	272	11.67	31.74	94.19
Seagreen Project	1575	63	20.00	12.6	630	0	0	299	20.00	59.8	221	5.00	11.05	362	11.67	42.25	125.7

Table 19.13 Estimated Expenditure for Project Alpha, Bravo and the Seagreen Project under a High and Low Case Scenario – Rest of Great Britain

	CAPEX (£m)	Project			Turbine			Foundation			Electrical			Installation			Total
High Case Scenario																	
	-	£m	Retention %	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	Expenditure £m
Project Alpha	1181	47	20.00%	9.4	472	15.00%	70.8	224	40.00%	89.6	165	5.84%	9.64	272	18.34%	49.88	229.32
Project Bravo	1181	47	20.00%	9.4	472	15.00%	70.8	224	40.00%	89.6	165	5.84%	9.64	272	18.34%	49.88	229.32
Seagreen Project	1575	63	20.00%	12.6	630	15.00%	94.5	299	40.00%	119.6	221	5.84%	12.91	362	18.34%	66.39	306.00
Low Case Scenario																	
	-	£m	Retention %	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	£m	Retention	Expenditure £m	Expenditure £m
Project Alpha	1181	47	0	0	472	0	0	224	0	0	165	0	0	272	0	0	0
Project Bravo	1181	47	0	0	472	0	0	224	0	0	165	0	0	272	0	0	0
Seagreen Project	1575	63	0	0	630	0	0	299	0	0	221	0	0	362	0	0	0

19.114. The IPA/ Scottish Renewables (2010) report provides factors and multipliers specific to offshore wind developments for the calculation of direct and indirect/ induced GVA from CAPEX. These factors have been applied to produce the GVA for the construction phase, shown in Table 19.14. No information on the split of the expenditure over time has been provided and hence this represents the total GVA related to the CAPEX.

Table 19.14 GVA for Scotland and the Rest of Great Britain

	GVA Scotland (£m)			GVA Rest of Great Britain (£m)		
	Direct	**Indirect + Induced**	**Total**	**Direct**	**Indirect + Induced**	**Total**
High Case						
Project Alpha	156	85	241	93	51	144
Project Bravo	156	85	241	93	51	144
Seagreen Project	208	113	321	124	67	192
Low Case						
Project Alpha	39	21	60	0	0	0
Project Bravo	39	21	60	0	0	0
Seagreen Project	52	28	80	0	0	0

19.115. As individual projects Project Alpha and Project Bravo have the potential to contribute GVA between a high case of £241 million and a low case of £60 in Scotland, if either project went forward without the other. In both the high and low case this would represent a beneficial impact on the Scottish Economy. The CAPEX would be spent over the 4 year construction period and hence would be a direct, short term impact. In the high case this would have a moderate and **significant beneficial impact**. In the low case this investment would have a minor impact which is not significant in terms of the EIA Regulations.

19.116. The Seagreen Project would contribute between a high case of £321 million and a low case of £80 million GVA in Scotland. Both scenarios present a beneficial, short term, direct impact associated with the Seagreen Project. As with the individual Phase I Projects assessed above, this would present a positive, short term, direct impact. In the high case this would have a moderate and **significant beneficial impact**. In the low case this investment would be considered minor and not significant.

19.117. With regard to the contribution to the Rest of Great Britain, Project Alpha and Project Bravo have the potential to contribute between a high case of £144 million and a low case of £0 of GVA per project, if either project went forward without the other. This represents a beneficial, short term, direct impact. Under the high case this is judged to be a minor impact and significant under the EIA Regulations. On the low case there is £0 GVA and hence the impact presents no impact and is therefore not significant in terms of the EIA Regulations.

19.118. The Seagreen Project would contribute between a high case of £192 million and a low case of £0 of GVA in the Rest of Great Britain. This represents a beneficial, short term, direct impact. Under the high case this is judged to be a minor and not significant. On the low case there is £0 GVA and hence the impact presents no impact and is therefore not significant in terms of the EIA Regulations.

Operational Expenditure (OPEX): Operation

19.119. OPEX is estimated to be £75,000 per MW per annum figure (BVG Associates, 2011). The anticipated operational lifespan of the project is 25 years with operation commencing from 2019.

19.120. The IPA/ Scottish Renewables (2010) Report provides retention factors for Scenario A and Scenario C in relation to OPEX. These are presented in Table 19.15 below.

Table 19.15 Retention Factors for OPEX in Scotland and the Rest of Great Britain

	Scenario A High Case (Scotland)	Scenario A High Case (Rest of Great Britain)	Scenario C Low Case (Scotland)	Scenario C Low Case (Rest of Great Britain)
Operational	44.7%	11.3%	33.1%	0%

19.121. Tables 19.16 and 19.17 below use these retention factors to predict the potential spend associated with Project Alpha, Project Bravo and the Seagreen Project per annum for Scotland and the Rest of Great Britain respectively. These have been converted to GVA using the multipliers and factors for operations and maintenance for offshore renewable (IPA/ Scottish Renewables, 2010).

Table 19.16 Estimated OPEX and GVA per Annum in Scotland in a High and Low Case Scenario - Scotland

	MW	OPEX per annum (£000s)	Scenario A High Case	OPEX (High Case) (£000s)	Total GVA High Case (£000s)	Scenario C Low Case	OPEX (Low Case) (£000s)	Total GVA Low Case (£000s)
Project Alpha	525	39,375	44.7%	17,601	11,730	33.1%	13,033	8,686
Project Bravo	525	39,375	44.7%	17,601	11,730	33.1%	13,033	8,686
Seagreen Project	1050	78,750	44.7%	35,201	23,459	33.1%	26,066	17,371

Table 19.17 Estimated OPEX and GVA per Annum in Rest of Great Britain in a High and Low Case Scenario – Rest of Great Britain

	MW	OPEX per annum (£ 000s)	Scenario A High Case	OPEX (High Case) (£000s)	Total GVA High Case (£000s)	Scenario C Low Case	OPEX (Low Case) (£000s)	Total GVA Low Case (£000s)
Project Alpha	525	39,375	11.3%	4,449	2,965	0%	0	0
Project Bravo	525	39,375	11.3%	4,449	2,965	0%	0	0
Seagreen Project	1050	78,750	11.3%	8,898	5,930	0%	0	0

19.122. In the event Project Alpha or Project Bravo proceeded individually and the other did not proceed, this would represent an annual GVA of between a high case of £11,730,000 and a low case of £8,686,000 in Scotland. This would represent a beneficial, long term, direct impact. This is judged to be a moderate and **significant beneficial impact** in the high case and a minor impact in the low case which is not significant.

19.123. If the Seagreen Project were to progress as a whole this would generate an annual GVA of between a high case of £35,201,000 and a low case of £17,371,000 in Scotland. This would represent a beneficial, long term, direct impact. This is judged to be a moderate impact for the low case and a major impact for the high case. Both are considered to have **significant beneficial impacts**.

19.124. In the event Project Alpha or Project Bravo proceeded individually and the other did not proceed this would represent an annual GVA of between a high case of £2,965,000 and a low case of £0 in the Rest of Great Britain. The high case presents a beneficial, long term, direct impact which is judged to be negligible and not significant. The low case would result in no GVA in the Rest of Great Britain which is no change.

19.125. If the Seagreen Project were to progress as a whole this would generate an annual GVA of between a high case of £5,930,000 and a low case of £0 in the Rest of Great Britain. The high case would represent a beneficial, long term, direct impact which is judged to be a negligible impact which is not significant. The low case would result in no GVA in the Rest of Great Britain which is no change.

Decommissioning

19.126. The costs of decommissioning would be less than that of construction and are likely to be spent over a shorter time period. As such the potential impacts of decommissioning are less than those determined for the construction phase.

Employment Impacts: Construction Phase

19.127. The employment likely to arise from an offshore wind development can be calculated from the predicted GVA utilising factors and multipliers. Factors specific to offshore wind developments are presented in the IPA/ Scottish Renewables (2010) report.

19.128. Separate factors are provided for direct and indirect employment. The predicted employment associated in a high and low case for Project Alpha, Bravo and the Seagreen Project are presented in Table 19.18 below.

Table 19.18 Estimated Construction Employees and Full Time Equivalent Employees.

	Employment - Scotland			Employment – Rest of UK		
	Direct	Indirect and Induced	Total Employment	Direct	Indirect and Induced	Total Employment
High Case						
Project Alpha	3392	2000	5392	2024	1194	3217
Project Bravo	3392	2000	5392	2024	1194	3217
Seagreen	4527	2669	7196	2700	1593	4293
Low Case						
Project Alpha	823	472	1295	0	0	0
Project Bravo	823	472	1295	0	0	0
Seagreen	1098	629	1728	0	0	0

Note figures may not add due to rounding.

19.129. If either Project Alpha or Project bravo proceeded on an individual basis this would have the potential to generate 5,392 jobs in a high case or 1,295 in a low case in Scotland. This would present a beneficial, short term impact. In the high case this would be judged to be a moderate / major impact, and moderate in the low case and both are considered to have **significant beneficial impacts**.

19.130. If the Seagreen Project progressed as a whole, this would have the potential to generate 7,196 jobs in a high case or 1,728 in a low case. Similarly this would represent a beneficial, short term impact. This would be judged to be a major impact in the high case and major / moderate in the low case which is therefore considered a **significant beneficial impact**.

19.131. In the rest of Great Britain Project Alpha and Bravo have the potential to generate a high case of 3,217 jobs and 0 jobs in the low case. This would present a beneficial, short term impact which is judged to be minor and **not significant** in the high case and no change in the low case.

19.132. The Seagreen Project has the potential to generate a high case of 4,293 jobs in the Rest of Great Britain, and 0 in a low case. This would present a beneficial, short term impact which is judged to be of minor in the high case and no change in the low case. The impact is **not significant** in either case.

19.133. As noted throughout this section the ES the decisions regarding the location of supply chain and therefore the location of these employment impacts has not yet been confirmed. As such it is not possible to draw conclusions regarding the assessment of the potential impacts of Project Alpha, Project Bravo, or the Seagreen Project on the four local administrative areas discussed in the existing environment. Below is an outline of the relevant employment characteristics identified in the baseline which may assist these local areas is securing employment benefits.

19.134. Of the four local administrative areas Fife has the largest population and number of skilled employees. In addition it has the highest percentage of the population with qualifications at NVQ 1 or above. Fife has strategic facilities and a commitment to invest in the supply chain for offshore wind through the provision of port facilities such as Rosyth and the Port of Methil, and the existence of established supply chain facilities such as Bi-Fab located at Methil. In addition Fife is undergoing inward investment in relation to the offshore wind supply chain through works at the Fife Energy Park, which is receiving investment from Scottish Enterprise.

19.135. Opportunities for the large ports, in particular Dundee, which has been identified as a zone of investment for the offshore industry, are significant. Supply chain impacts for the UK offshore wind industry have been extensively documented and existing infrastructure and port facilities present an opportunity to benefit from the industry.

19.136. Considering the employment characteristic of the four administrative areas, all areas have a percentage of the population with non or low education which is equal or less than that of the Scotland average. All the four areas have the highest percentage of employees in managerial and professional positions. The adaptation of skilled professionals and education facilities, have been highlighted across publications as an essential component of delivering offshore projects and supply chain. Whilst the impact on these administrative areas cannot be quantified and assessed at this stage, the skills diversification, training and associated employment opportunities provided by the offshore industry would result in a positive impact on the socio-economic indicators should these four administrative areas be able to maximise their input to the Seagreen Project.

Direct Operational Employment

19.137. Industry reports (Oxford Economics, 2010) estimate a likely scenario of 0.19 direct O&M jobs created per MW for offshore wind in the UK. This translates to approximately 100 O&M jobs for each of Project Alpha and Project Bravo, and therefore approximately 200 O&M jobs for the Seagreen Project.

19.138. The generation of these employment roles would present a beneficial, long term, direct, impact. The impact as a result of Project Alpha or Project Bravo would be moderate and significant in terms of the EIA Regulations. The impact from the Seagreen project would be moderate and **significant beneficial**.

Mitigation: Socio-Economics

19.139. No mitigation is proposed with regard to socio-economic impacts and none is thought necessary as all impacts are considered to be beneficial.

IMPACT ASSESSMENT: TOURISM AND RECREATION

Direct Impacts

19.140. The direct impacts associated with the Seagreen Project on tourism and recreation is limited to those associated with the construction phase of the Export Cable. Recreational sailing impacts have been assessed in Chapter 16: Navigation and Shipping of this ES and hence are not assessed here. The assessment of direct impacts is therefore limited to the construction phase at the landfall point.

19.141. Table 19.8 (paragraph 19.82) identified the tourism and recreation receptors for direct impacts to be Barry Sands and Carnoustie Bay. Both of these areas fall within the ECR corridor. For a temporary period within the construction phase, works to the coastal zone may prevent access to the beach and sea. Access would be prevented for safety reasons for a temporary period of up to 3 months.

19.142. This exclusion may affect users of the beach and sea such as families, walkers, kayakers, surfers, windsurfers and fishermen. The works would be limited to the area within the ECR corridor, illustrated in Figure 1.1 and would not preclude access to neighbouring beach areas such as the northern end of Carnoustie Bay. There are also numerous other beaches of equal or higher value for recreational and tourism activities in the area such as Lunan Bay, Montrose Bay and Tentsmuir, and hence the receiving environment is considered to have a high capacity to accommodate the anticipated impacts.

19.143. The magnitude of change with regard to the direct impacts is judged to be negligible as the change will be temporary, for a maximum of 3 months, and will not result in a permanent change to the receptor; once the work is complete access to the receptors will be as prior to the works. The export cable will be laid below the surface and hence will not result in any permanent change to the utilisation of the receptors as a tourism or recreation resource.

19.144. The sensitivity of both receptors for direct impacts was judged to be low, combined with a magnitude of change of negligible this produces an impact of negligible significance which is therefore **not significant** in terms of the EIA Regulations.

Indirect Impacts

19.145. Indirect impacts are associated with the view of the operational Seagreen Project from valued tourism and recreation receptors and the potential change of the value of that receptor as a result.

19.146. Paragraphs 19.95 to 19.100 provided a review of the recent published survey results with regard to the perception of wind farms by visitors and tourists in the UK. From a review of the survey findings there is no evidence to suggest that a view of a wind farm has a detrimental impact on visitors. These surveys relate to onshore wind farms, and the North Hoyle Wind Farm which is located approximately 8km off the coast of Wales. The Seagreen Project is located substantially further in distance from land based tourism and recreation receptors and hence it is judged less likely that a view of the Seagreen Project would affect the attraction of visitors to the receptors.

19.147. This has been considered in assigning the sensitivity of the receptors which are all judged to have a low sensitivity to the Seagreen Project, which has been combined with the value of the receptor to give the overall sensitivity.

19.148. The magnitude of impacts is a function of the degree of visibility of the Seagreen Project which has been determined using the findings of Chapter 15: SLVIA of this ES. It should be noted the SLVIA did not identify the potential for significant visual impacts on receptors beyond 35km from the operational turbines. Table 19.19 below summarises the magnitude of indirect impacts for the relevant receptors.

Table 19.19 Magnitude of Impact on Indirect Tourism and Recreation Receptors

Receptor	Comments	Magnitude
National Cycle Network 1	The Seagreen Project will be visible from defined points along the coastal path at a minimum distance of 27.5km. A small section of the route between Montrose and north of Inverbervie will experience uninterrupted views of the operational turbines. This represents a very small proportion of the route.	Low
Fife Coastal Path	Only blade tips of the turbines will be visible and will be negligible to the user of the footpath. This represents a small alteration to the characteristics of the receptor.	Negligible
Golf Clubs and Links	All the golf clubs are located over 35km from the operational turbines.	Negligible
Beaches	Some important beaches for tourism and recreation such as Lunan Bay and Montrose Bay are located within 35km of the operational turbines and may experience direct views.	Medium
Settlements with tourist facilities	Settlements within 35km of the operational turbines will experience views where the tourism or recreational facility in question has an uninterrupted view of the sea in the direction of the Seagreen Project. This will apply to limited receptors within these settlements.	Low
Caravan parks	All the identified receptors are located more than 35km from the operational turbines and hence will experience limited visibility.	Negligible
Seaview vantage points	Vantage points within 35km would be able to view the Seagreen Project on the distant horizon. As visitors to vantage points are likely to pause to take in the view the potential magnitude of impact is higher.	Medium

19.149. Combining the sensitivity of the receptor with the magnitude of impact utilising the matrix in Table 19.5 of this chapter provides the level of significance of the indirect impacts on tourism and recreational receptors. Table 19.20 presents the results of this assessment.

Table 19.20 Summary of Indirect Impacts on Tourism and Recreation Receptors

	Sensitivity	Magnitude	Significance
National Cycle Network 1	Medium	Low	Minor **(not significant)**
Fife Coastal Path	Low/ Medium	Negligible	Negligible **(not significant)**
Golf Clubs and Links	Medium	Negligible	Negligible **(not significant)**
Beaches	Low	Medium	Minor **(not significant)**
Settlements with tourist facilities	Low	Low	Negligible **(not significant)**
Caravan parks	Low/ Medium	Negligible	Negligible **(not significant)**
Seaview vantage points	Low	Medium	Minor **(not significant)**

19.150. The indirect impacts on all receptors have been found to have a significance of minor or negligible and hence are **not significant** in terms of the EIA Regulations.

Mitigation: Tourism and Recreation

19.151. No significant impacts have been identified in relation to tourism and recreation. As such no mitigation is proposed.

Residual Impacts

19.152. Table 19.21 below provides a summary of the impacts identified throughout this chapter.

Table 19.21 Summary of Impacts

Impact	Project	Nature of Impact	Significance	Significant in terms of EIA Regulations	Mitigation	Residual Impact
Socio-Economic Impacts						
CAPEX: Construction Phase **Impacts in Scotland**	Project Alpha	Beneficial, short term, direct	Low – Minor High - Moderate	Low – No High – Yes	None proposed	Low – Minor High – Moderate **(significant beneficial)**
	Project Bravo	Beneficial, short term, direct	Low – Minor High - Moderate	Low – No High – Yes	None proposed	Low – Moderate High – Major **(significant beneficial)**
	Seagreen Project	Beneficial, short term, direct	Low – Minor High - Moderate	Low – No High – Yes	None proposed	Low – Minor High – Moderate **(significant beneficial)**
CAPEX: Construction Phase **Impacts in Rest of Great Britain**	Project Alpha	Beneficial, short term, direct	Low – No Change High - Minor	Low – No High – No	None proposed	Low – No Change High – Minor
	Project Bravo	Beneficial, short term, direct	Low – No Change High - Minor	Low – No High – No	None proposed	Low – No Change High – Minor
	Seagreen Project	Beneficial, short term, direct	Low – No Change High - Minor	Low – No High – No	None proposed	Low – No Change High – Minor
OPEX: Operational Phase Impacts in Scotland	Project Alpha	Beneficial, long term, direct	Low – Minor High – Moderate	Low – No High – Yes	None proposed	Low – Minor High – Moderate **(significant beneficial)**
	Project Bravo	Beneficial, long term, direct	Low – Minor High – Moderate	Low – No High – Yes	None proposed	Low – Minor High – Moderate **(significant beneficial)**
	Seagreen Project	Beneficial, long term, direct	Low – Moderate High - Moderate	Low – Yes High – Yes	None proposed	Low – Moderate High – Moderate **(significant beneficial)**

Impact	Project	Nature of Impact	Significance	Significant in terms of EIA Regulations	Mitigation	Residual Impact
OPEX: Operational Phase Impacts in Rest of Great Britain	Project Alpha	Beneficial, long term, direct	Low – No change High – Negligible	Low – No High - No	None proposed	Low – No change High – Negligible
	Project Bravo	Beneficial, long term, direct	Low – No change High – Negligible	Low – No High – No	None proposed	Low – No change High – Negligible
	Seagreen Project	Beneficial, long term, direct	Low – No change High – Negligible	Low – No High – No	None proposed	Low – No change High – Negligible
Employment: Construction Impacts in Scotland	Project Alpha	Beneficial, short term, direct	Low – Moderate High - Moderate/ Major	Low – Yes High – Yes	None proposed	Low – Moderate High – Moderate/ Major **(significant beneficial)**
	Project Bravo	Beneficial, short term, direct	Low – Moderate High - Moderate/ Major	Low – Yes High – Yes	None proposed	Low – Moderate High – Moderate/ Major **(significant beneficial)**
	Seagreen Project	Beneficial, short term, direct	Low – Moderate/ Major High - Major	Low – Yes High – Yes	None proposed	Low – Moderate/ Major High – Major **(significant beneficial)**
Employment: Construction Impacts in Rest of Great Britain	Project Alpha	Beneficial, short term, direct	Low – No change High - Minor	Low – No High – No	None proposed	Low – No change High – Minor
	Project Bravo	Beneficial, short term, direct	Low – No change High - Minor	Low – No High – No	None proposed	Low – No change High – Minor
	Seagreen Project	Beneficial, short term, direct	Low – No change High - Minor	Low – No High – No	None proposed	Low – No change High – Minor

Impact	Project	Nature of Impact	Significance	Significant in terms of EIA Regulations	Mitigation	Residual Impact
Employment: Direct Operational	Project Alpha	Beneficial, long term, direct	Moderate	Yes	None proposed	Moderate **(significant beneficial)**
	Project Bravo	Beneficial, long term, direct	Moderate	Yes	None proposed	Moderate **(significant beneficial)**
	Seagreen Project	Beneficial, long term, direct	Moderate	Yes	None proposed	Moderate **(significant beneficial)**
Tourism and Recreation: Direct Impacts	Seagreen Project	Adverse, short term, direct, temporary	Negligible	No	None proposed	Negligible
Tourism and Recreation: Indirect Impacts	Seagreen Project	Adverse, long term, indirect, permanent	Negligible to Minor	No	None proposed	Negligible to Minor

IMPACT ASSESSMENT: CUMULATIVE AND IN-COMBINATION IMPACTS

Socio-Economic Impacts

19.153. The following section presents an assessment of the cumulative and in-combination impacts of the Seagreen Project with other developments. The main assessment presented in the chapter above, provided an assessment for either Project Alpha or Bravo proceeding as an individual project, without the other; and an assessment of the Seagreen Project (including both Project Alpha and Bravo) proceeding.

19.154. The purpose of this section is to assess the cumulative impacts of the Seagreen Project, with other developments which may present a cumulative impact.

19.155. A discussion document relating to Cumulative Effects entitled Scottish Territorial Waters Offshore Wind Farm – East Coast: Discussion Document – Cumulative Effects (Royal Haskoning, 2009) was produced on behalf of the developers associated with these projects. The developers have formed the Forth and Tay Offshore Wind Developers Group (FTOWDG), to produce this document and liaise over potential cumulative impacts associated with the projects in this area.

19.156. The discussion document identified 4 Scottish Territorial Waters (STW) offshore wind sites which may have the potential to result in cumulative impacts alongside the Seagreen Project. These are:

- Inch Cape;
- Neart na Gaoithe;
- Bell Rock; and
- Forth Array.

19.157. Since the development of the document only Neart na Gaoithe and Inch Cape have been progressed by the developers. Available data from these projects is therefore presented in this assessment. The discussion document stated that the socio-economic effects would consider expenditure and employment. It is stated that, "*it is likely that assessment of effects will be undertaken on a site-specific basis, and based on a review of available literature relating to the socioeconomic effects of offshore wind farm development, with developers subsequently sharing information to enable an informed assessment of cumulative effects within their EIAs*". This approach has been followed here in the following sections.

19.158. The cumulative expenditure and employment effects associated with the Seageen Project with other offshore wind farms will be substantially influenced by the programmes for each project. Where projects occur concurrently this may lead to an overall increased expenditure and associated employment generation, but as illustrated by the assessment presented in paragraph 19.110 of this chapter, the retention of this expenditure in the geographical location i.e. Scotland or the UK, is a significantly determining factor in assessing the impact.

19.159. Where projects create an increase in demand the Scottish and UK supply chain may not have the capacity to provide the required level of service, and hence the impacts may not increase as expected in line with the increased expenditure. There is potential this could result in reducing the positive impacts summarised in Table 19.21 of this chapter.

19.160. Further cumulative impacts could occur if the Seagreen Project were to share operations and maintenance support with another development operator. This could provide economies of scale, but would in effect reduce the overall project expenditure and therefore expenditure and employment in the local economy. As such the level of positive impact associated with socio-economic impacts is reliant on the capacity of the supply chain and resources in the local area, Scotland and the UK.

19.161. Significant work is being undertaken from a strategic level to attract investment to and facilitate the development of a supply chain in Scotland and the UK. This includes recent announcements from turbine manufacturers such as Siemens, Mitsubishi and Samsung Heavy Industries, to invest in pre-assembly, research and development and manufacturing facilities in the UK. The development of the supply chain through these developments and investment in the skilled supply chain will facilitate maximising the potential opportunities to retain the expenditure and employment beneficial impact of offshore wind, including the Seagreen Project, in Scotland and the UK.

19.162. In conclusion the risk associated with the supply chain not being developed, and hence the positive impacts being reduced, is currently balanced with the policy drive and developing supply chain. As such the cumulative effects remain as predicted in Table 19.21.

19.163. Phase 2 and 3 of the Seagreen Project would involve further development of the Zone. This would occur in a different time period to the development of Phase 1 and therefore would not result in a challenge for supply chain resources. As such this would contribute further expenditure and employment for direct, indirect and induced effects. As there is currently no information about the timescales or extent of these phases, and it is likely more information on the supply chain and retention will be available in future, no quantitative assessment of the impacts has been made. It can however be concluded that is the highly likely that the development of future phases would lead to an increase in terms of expenditure and employment which would further increase the level of positive impacts.

Tourism and Recreation

19.164. The Scottish Territorial Waters Offshore Wind Farm – East Coast: Discussion Document – Cumulative Effects (Royal Haskoning, 2009) scoped out the need for a cumulative assessment of impacts on Tourism and Recreational receptors. It was stated that the impacts on tourism and recreational activities will primarily result from temporary disruption caused by construction activities. Given the minimal nature of impacts offshore and the localised nature of effects at the coast, it is expected that any impacts would be assessed on an individual site basis as part of project EIA. This approach was agreed with the regulator and agencies during the consultation process on the discussion document and as such no assessment is presented here.

REFERENCES

DECC (2011). *National Policy Statement for Renewable Energy Infrastructure* (EN-3). The Stationery Office (TSO), UK

General Register Office for Scotland (2012). *Mid – 2011 Population Estimates* Scotland http:/ / www.gro-scotland.gov.uk/

Glasgow Caledonian University (2008). *The Economic Impacts of Wind Farms on Scottish Tourism:* A Report for the Scottish Government http:/ / www.scotland.gov.uk/ Resource/ Doc/ 214910/ 0057316.pdf

HM Government (2009.*) The UK Renewables Energy Strategy* http:/ / www.scotland.gov.uk/ Publications/ 2011/ 08/ 04110353/ 0

Fuller, K. et al (2004). *Guidelines for Environmental Impact Assessment*, IEMA, Lincoln

IPA/ Scottish Renewables (2010). *Scottish Offshore Wind: Creating an Industry* IPA Energy + Water Economics, Edinburgh.

Land Use Consultants (2007). *A Review of Marine and Coastal Recreation*. Scottish Natural Heritage Commissioned Report No.247 (ROAME No. F05AA608).

Office of National Statistics (2011). *Regional, sub regional and local Gross Value Added 2010.* ONS, UK

Office of National Statistics (2011). *Construction Statistics – Annual Report No 12.* ONS, UK

Office of National Statistics (2012). *Regional Labour Market Statistics.* ONS, UK

Oxford Economics (2010). *Analysis of the Employment Effects of the Operation and Maintenance of Offshore Wind Parks in the UK. A Report for Vestas Offshore.* Oxford Economics, UK

RBA Research, (2008). *Written Evidence to the Select Committee on Innovation, Universities, Science and Skills*: North Hoyle Offshore Wind Farm—2nd Public Attitude Survey.
Innovation, Universities, Science and Skills Committee Publications. House of Commons, UK.
(http:/ / www.publications.parliament.uk/ pa/ cm200708/ cmselect/ cmdius/ 216/ 216we96.htm

Willow C, Valpy B (BVG Associates) (2011). *Offshore Wind Forecasts of future costs and benefits Renewable UK*, UK

Scottish Enterprise/ Highland and Islands Enterprise (2009). *National Renewables Infrastructure Plan (N-RIP) Stage 2.* Scottish Government, Edinburgh.

Scottish Government (2009). *National Planning Framework for Scotland 2.* Available at: http:/ / www.scotland.gov.uk/ Resource/ Doc/ 278232/ 0083591.pdf

Scottish Government (2010). *A Low Carbon Economic Strategy for Scotland – A Low Carbon Society*. Scottish Government Edinburgh.

Scottish Government (2010a). *Scottish Planning Policy (SPP): A Statement of the Scottish Government's Policy on Nationally Important Land Use Planning Matters.* Scottish Government, Edinburgh.

Scottish Government (2011.*) 2020 Routemap for Renewable Energy in Scotland.* Scottish Government, Edinburgh. Available at: http:/ / www.scotland.gov.uk/ Publications/ 2009/ 07/ 06095830/ 2020Routemap

Scottish Government (2011a). *Statistics from the Annual Population Survey 2010* Scottish Government, Edinburgh.

Seagreen (2010). *Seagreen Phase 1 Scoping Report*. Document No. A6SW/ SEAG-Z-DEV230-SWR-020-A3. Seagreen, Glasgow.

Tyldesley D and Associates (2009). *A Handbook for Environmental Impact Assessment*, Scottish Natural Heritage, Edinburgh