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Hywind Scotland Pilot Park Project – Assessment of socio-economic indicators and Impacts

Enquiry No. 027063

Hywind (Scotland) Limited

Draft Report

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Confidential

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1. Introduction

This socio-economic impact assessment is being conducted by Optimat Limited for Hywind (Scotland) Limited. The assessment identifies the potential impacts associated with the construction, operation and maintenance and decommissioning of the five turbine floating offshore wind farm with a planned location approximately 25km east of Peterhead with a landfall location for the connector cable being in Peterhead itself.

The scope of this report covers the direct and supply chain economic potential impacts and the potential impacts on the local tourism and recreation activities. The purpose of this report is to prepare the necessary information required for the socio-economic impact assessment section of the Environmental Statement to be submitted as part of the consenting process.

1.1 Scope of the assessment

The scope of this assessment is consistent with the Rochdale envelope used for other sections of the Environmental Statement and it considers both the maximum or worst case parameters for the Project.

The scale of the socio-economic impact is highly dependent on the location of the fabrication of the tower structures and hence the degree to which the Scottish supply chain will be involved. At this stage two scenarios are used to calculate the impact on the supply chain:

Scenario 1 - where all construction & installation, operations & maintenance, decommissioning the fabrication takes place in Scotland, except for turbine and heavy lift vessels.

Scenario 2 – All construction and installation work is completed outside Scotland, with only operation & maintenance and decommissioning carried out locally within Scotland.

The potential supply chain is described and analysed at two levels: Scotland-wide and 50 radius from Peterhead.

The study area for the tourism and recreation impact assessment covers a 30km radius around the proposed offshore development site. This area does not map directly onto local authority or postcode boundaries, so data on number of relevant business units, employment, gross value added, etc. The reporting of baseline and impact assessment therefore uses best fit datasets base on local authority boundaries, regional tourism areas and postcode districts.

1.2 Methodology

The approach to this impact assessment commenced with a review of relevant economic and social policy and strategy documents at Scottish and regional levels. The baseline socio-economic situation was developed by identifying the latest indicator datasets available on employment, gross value added, population and degree of economic activity. The analysis focused on: the general economy (Aberdeen City and Aberdeenshire performance relative to Scotland); the offshore supply chain (at a range of geographical levels) and; tourism and recreation activities (again at a range of different geographical levels). The data sources used are described in sections 1.2.1 and 1.2.2. The economic impact assessment has been undertaken by Optimat Limited, based on the market review. The analysis has been

undertaken in accordance with Scottish Enterprise's (SE) economic impact assessment and additionality guidance[1], the HM Treasury Green Book guidance[2] and the Scottish Government Annual Statistics[3]. The assumptions for used for pilot park impact assessments are summarised below and described in the following section.

Sources of Impact

The outcomes and impacts calculated are measures of economic impact and are expressed as:

- Employment as net job years; and
- Gross Value Added (GVA).

The sources of economic impact considered in this report include:

- Impacts associated with the development, construction, installation, operation and final decommissioning
- Impacts on the existing indigenous supply chain active in the offshore wind sector and businesses that have the potential to supply the offshore wind sector
- Impacts from inward investment attracted by the opportunity to supply a pilot wind farm
- Long term capital and operational spend on the Scottish economy over the lifetime of the Hywind Scotland project

Additionality

The purpose of this economic impact assessment is to assess the additional benefits from the proposed Project. The additionality is the net change that takes place as a result of the development taking place over what would take place anyway.

Additionality can be calculated through finding the benefits of the intervention option minus the benefits that would have happened anyway if the intervention did not take place (reference case or deadweight), which gives the net additionality of the intervention. The SE guidance sets out five levels of deadweight, which can be applied to the gross impact of the intervention:

- none – all benefits are result of intervention (0%);
- low – the majority of benefits are result of intervention (25%);
- medium – half of the benefits are result of intervention (50%);
- high – high level of benefits are not as a result of intervention (75%); and
- total deadweight – none of the benefits are as a result of intervention (100%).

For the Project the deadweight has been assumed to be zero because all the resulting benefits will be a direct result of project. The additionality and reference case impacts also have to be adjusted through making assumptions regarding how much of the benefits actually occur, in

[1] www.scottish-enterprise.com/sedotcom_home/about-us/research-publications/evaluations-impact.htm
[2] www.hm-treasury.gov.uk/data_greenbook_supguidance.htm
[3] http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/IOAllFiles2007

the area where the project is targeted (in this case, the Scottish economy). This is done by taking account of leakage, displacement, substitution and multipliers.

Leakage accounts for the proportion of outputs, which benefit those outside of Scotland. SE guidance outlines six levels of leakage:

- none – all the benefits go to the target area (0%);
- low – the majority of benefits go to the target area (10%);
- medium – a reasonably high level of benefits are retained in the target area (25%);
- high – many of the benefits go out-with the target area (50%);
- very high – a substantial number of those benefiting will be outside the target area (75%); and
- total leakage – all the benefits accrue outside the target area (100%).

For the Project leakage will vary considerably from medium to total leakage for a number of areas where there is no supplier capability in Scotland eg bedplates, turbine blades, generators etc. The assessment considered two leakage scenarios including:

Scenario 1 – Zero leakage eg 100% construction & installation, operation & maintenance and decommissioning activity carried out in Scotland, excluding turbines and heavy lift vessels over a 20 year project timescale

Scenario 2 – 60% leakage eg all construction & installation work provided from outside Scotland, with operation & maintenance and decommissioning activity provided by Scottish based businesses

Displacement considers the proportion of benefits accounted for by reduced benefits elsewhere (which would have occurred if the intervention had not taken place) in the Scottish economy. This arises where the intervention takes market share (product market displacement) or labour, land or capital (factor market displacement) from other existing firms within Scotland. SE guidance outlines five possible levels of displacement:

- none – no other firm / demand effected (0%);
- low – limited displacement effects (25%);
- medium – roughly half of the activity would be displaced (50%);
- high – a high level of displacement would arise (75%); and
- total displacement – all of the activity generated would be displaced (100%).

Activity in the Scottish offshore wind sector is currently low, with most companies for waiting for orders to be placed by the developers for Round 3 and Scottish Territorial Waters. Many companies are taking on work for other sectors and we therefore assumed no negligible impact (0%) for the Project.

Multiplier effects - the economic benefits of an intervention are multiplied because of knock-on effects within the economy. SE guidance identifies two types of multiplier:

- a supply linkage multiplier (sometimes referred to as an indirect multiplier) due to purchases made as a result of the intervention and further purchases associated with linked firms along the supply chain; and
- an income multiplier (also referred to as a consumption or induced multiplier) associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the intervention.

We believe there will be both indirect and induced multipliers as a result of the Hywind project these have taken into account during the analysis.

1.2.1 Direct and supply chain economic baseline and potential impacts

The baseline situation for the overall economic performance and the offshore wind supply chain was developed using sources listed in the table below.

Data Source Title	Description of relevant information/ data	Publisher	Date
Pentland Firth and Orkney Waters Enabling Actions Report – A Socio-Economic Methodology and Baseline for Pentland Firth and Orkney Waters Wave and Tidal Developments	Appendix C, Table 3 –'Linking Supply Chain Activities to SIC Codes'. Although the report is for wave and tidal developments it does provide a useful basis upon which to identify potential offshore wind supply chain companies via SIC codes	The Crown Estate	2012
MINT UK Database	Business information database that uses 11 specialist sources allowing access to over 5 million UK companies (including unincorporated businesses)	Bureau Van Dijk	Accessed February 2014
D&B UK Trading File	Business database containing over 4 million business records in the UK	Dun & Bradstreet (via Marketingfile.com	Accessed April 2014
Energy North Members Directory	Industry support organisation database of more than 100 mainly North of Scotland based companies active in the offshore energy sectors. This included information on business activity, services/ equipment and helped to identify relevant companies in the supply chain and potential new entrants.	Energy North www.energynorth.co.uk	Accessed April 2014
Renewables Scotland	Industry support organisation database of over 300 members across Scotland that are either active or interested in supplying the renewable energy sector, including offshore wind.		Accessed Feb to April 2014

Table 1 - Sources of data to develop the economic and offshore wind supply chain baseline

A supply chain database was developed covering three geographical areas eg Scotland wide, 100 miles and 50 miles radius from Peterhead. More than 3,400 companies were initially identified across Scotland from relevant SIC codes using MINT and D&B databases, including employment and turnover figures. These were reviewed Optimat analysts and narrowed down in terms of their fit with the offshore wind sector to provide a supply chain profile of around 700 Scottish based companies that have the potential to supply goods and services at each stage of the Project.

An economic impact assessment of 'the Project' was undertaken to identify the potential impacts and potential significance of these impacts on direct employment/GVA, supply chain impacts and potential for inward investment. This included an online survey, using the QuestionPro' online package (Appendix 1), to inform the assessment of the potential impact upon local and Scotland wide businesses and the economy. Results of the survey indicate the level of interest in the Project, available absorption capacity of the Scottish supply and the potential benefits to the business community. From a total of 100 invited companies covering construction, installation, operation & maintenance and decommissioning activities, 72 companies or ~10% of the profiled supply chain viewed the survey and 26 of these completed the survey (26% response rate). Respondents to the survey provided a quantified view of the potential impacts on their businesses in terms of new jobs created, safeguarding existing jobs and increased turnover.

In-depth telephone interviews were undertaken with a sample of key suppliers that could potentially provide a range of products and services such raw material (steel), tower fabrication, substructure fabrication, turbine manufacture, cable installation, engineering design and onshore substation installation. This provided a qualified view of the potential impacts and the level of company interest in the project, including a list of potential suppliers that expressed interest in supplying various goods and services.

The methodology used to analyse the baseline and impact assessment data, gathered from desk-based research and stakeholder consultations, included economic and demographic profiling of the local areas compared to Scottish data. The local, regional and Scotland wide supply chains were analysed, by segmenting capabilities using the following offshore wind sector categorisation system.

Business Activity			Primary UK SIC
Construction & Installation	Development & Planning	Engineering design	Engineering design activities and related technical consultancy (71.1)
		Environmental impact assessments	Other professional, scientific and technical activities nec (74.9)
		Met Stations	Other professional, scientific and technical activities nec (74.9)
		Geophysical/Geotechnical surveys	Other professional, scientific and technical activities nec (74.9)
	Wind Turbine	Manufacture of other fabricated metal products	Manufacture of metal structures (25.9)
		Nacelle	Manufacture of metal structures (25.1)
		Blades	Manufacture of composite structures (23.1)
		Bedplate	Manufacture of castings (24.52)
		Gearbox and drivetrain	Installation of industrial machinery (32.9)
		Generator/rotor system	Manufacture of electrical equipment (28.11)
		Tower manufacture	Manufacture of other fabricated metal products n.e.c. (25.99)
	Balance of Plant	Fabricated metal structures/part structures	Manufacture of metal structures (25.1)
		Substructure/foundation fabrication	Manufacture of other fabricated metal products n.e.c. (25.99)
		Mooring system fabrication	Manufacture of other fabricated metal products n.e.c. (25.99)
		Onshore/offshore substations	Electrical installation (43.21)
		Export cable manufacture	Manufacture of other electric wires and cables (27.32)
		Electronic components and control systems	Electrical installation (26.1, 26.5)
	Installation	Turbine installation	Installation of industrial machinery (32.9)
		Foundation installation	Specialised construction activities (43)
		Tow out and lifting vessels	Service activities incidental to water transport (52.22)
		Subsea cable laying/installation	Electrical installation (43.2)
		Offshore substation installation	Construction of port transmission lines (42.22)
		Inshore construction/assembly ports	Provision of port services (52.22)
Operation & Maintenance		Maintenance and repair services	Repair of fabricated metal products, machinery and equipment (33.19)
		Replacement equipment	Repair of fabricated metal products, machinery and equipment (33.19)
		Onshore repair/spares ports	Service activities incidental to water transport (52.22)
		Accommodation	Service activities incidental to water transport (52.22)
		Personnel transfer vessels	Sea and coastal freight water transport (50.20, 52.22)
		Installation / repair vessels	Sea and coastal freight water transport (50.20, 52.22)
Decommission		Design and engineering services	Engineering design activities and related technical consultancy (71.1)
		Marine lifting / crane vessels	Sea and coastal freight water transport (50.20, 52.22)
		Support vessels	Sea and coastal freight water transport (50.20, 52.22)
		Port facilities	Sea and coastal freight water transport (50.20, 52.22)
		Diving/ROV services	Other professional, scientific and technical activities (not including environmental consultancy or quantity surveying) n.e.c. (74.90)
		Environmental impact assessments	Other professional and technical activities nec (74.9)

Table 2 - Supply Chain Categorisation

The direct and supply chain impacts were measured quantitatively by calculating Gross Value Added (GVA) and full time equivalent jobs, using turnover to GVA ratios obtained from the ONS (Office of National Statistics) guidance notes[4] that are specific to the sector where the impact is derived from. This approach provided gross impacts, primarily based on analysis of indigenous supply chain capability/capacity to meet demand for goods and services. The impact analysis involved the calculation of net additional impact using best practice such as the Scottish Enterprise Evaluation Guidance Note[5] and the HM Treasury Green Book guidance[6]. It included outputs from both the desk research, online and telephone interview surveys of potential beneficiaries to assess net impact from gross impact, based on the impact of the following issues:

- *displacement* – does the Pilot Park project lead to a reduction of economic impact elsewhere in the economy eg will it develop at the expense of other offshore wind projects in Scotland
- *leakage* – this is covered by asking where supplies will be purchased and the residence of employees
- *multipliers* – the first round of multiplier impact i.e. the increase in turnover of supplier companies to the projects

The impact assessment covered the potential impact and potential likelihood of those impacts occurring on a range of receptors including direct impact on the local economy (through additional GVA and employment) and through the supply chain (including inward investment opportunities) activities. The analysis assesses the impacts on these receptors at construction & installation, operation & maintenance and decommissioning stages of the pilot project. Professional judgement, desk-based evidence and stakeholder views were used to assess the magnitude of each potential impact.

Two scenarios were considered to assess the economic impact of the project on the Scottish supply chain, including:

- Scenario 1 - 100% construction & installation, operation & maintenance and decommissioning activity carried out in Scotland over a 25 year project timescale
- Scenario 2 – all construction & installation work provided from outside Scotland, with operation & maintenance and decommissioning activity provided by Scottish based businesses

The analysis will also conclude on the sensitivity of tourism and recreation receptors, which is described in the following section.

1.2.2 Tourism and recreation baseline and potential impacts

The baseline situation for tourism and recreation activities was developed using the data sources listed in the following table.

[4] Measuring the economic impact of an intervention or investment, Dec 2010, ONS UK Government
[5] A summary guide to evaluating economic development projects or programmes, Scottish Enterprise
[6] The Green Book: appraisal and evaluation in central government

Data source title	Description of relevant information/ data	Publisher	Date
Economic Assessment of Short Term Options for Offshore Wind Energy in Scottish Territorial Waters: Costs and Benefits to Other Marine Users and Interests	Chapters three and four contain useful guidance and information for the development of the baseline of tourism and recreation and also the areas of potential impact to be assessed	Marine Scotland	2011
MINT UK Database	Business information database that uses 11 specialist sources allowing access to over 5 million UK companies (including unincorporated businesses)	Bureau Van Dijk	Accessed February 2014
Tourism in Scotland's Regions 2012	Comparison of key regional tourism statistics in Scotland	Visit Scotland	2013
D&B UK Trading File	Business database containing over 4 million business records in the UK	Dun & Bradstreet (via Marketing File)	Accessed April 2014
Scottish Annual Business Statistics 2011	A range of key economic data for businesses in Scotland. Segmented by 2007 SIC code divisions and by Local Authority areas	Scottish Government	2013 (covering 2011 data)
Scottish Neighbourhood Statistics	Collection of statistical data on various socio-economic factors across a range of geographical levels	The Scottish Government	2011 data – accessed March 2014
Labour Market Intelligence across Scotland	Various labour market statistics at local authority and national level	Skills Development Scotland	2014 data
Visit Scotland website	National and regional information on tourism and recreation activities	Visit Scotland	Accessed February to April 2014

Table 3 - Sources of data to develop the tourism and recreation baseline

The geographical boundaries used to create the baseline information followed that used by relevant data sources. This included:

- National (Scottish) and local authority (Aberdeen City and Aberdeenshire) level data for the socio-economic overview and comparison: population, employment activity, gross value added by sector. Data sources included Scottish Neighbourhood Statistics, Scottish Annual Business Survey and Labour Market Intelligence
- National (Scottish) and regional (Aberdeen and Grampian or Aberdeen City and Shire, depending on data source) level analysis of tourism and recreational activity. Data sources included Visit Scotland and Marine Scotland publication
- Postcode based selection of business classified as 'sustainable tourism' (including recreation) for the AB and AB42 areas (AB approximating Aberdeen City and Shire and AB42 approximating Peterhead and the surrounding area). Data sources included the MINT business database

- The 30km study radius for the tourism and recreation baseline used information from the Visit Scotland website and the MINT UK database

In addition to the desk based research a number of regional and local tourism and recreation organisations were approached to provide feedback on potential impacts. A total of six organisations were approached.

1.2.3 Assessment criteria

Assessment of the significance of impacts consists of a combination of the sensitivity of the receptor and magnitude of impact. The frameworks for sensitivity and magnitude are shown in the tables below.

Sensitivity of receptor	Definition		
	Economic	Tourism	Recreation
Very high	N/A	International status or very high visitor numbers	International status or very high participant numbers
High	N/A	National status or high visitor numbers	National status or high participant numbers
Medium	N/A	Regional status or high visitor numbers	Regional status or medium participant numbers
Low	N/A	Local status or few visitor numbers	Local status or few participant numbers
Negligible	N/A	Local status or very few visitor numbers	Local status or very few participant numbers

Table 4 - Framework for assessing sensitivity of receptor

Magnitude of impact	Definition			
	Economic	Supply chain	Tourism	Recreation
Severe	N/A	N/A	N/A	N/A
Major	Greater than local scale or which exceeds accepted performance. Impact likely to occur.	>15% turnover change or substantial new job numbers. Impact likely to occur.	>15% turnover change. Impact likely to occur.	Major visual impact and/or physical interruption. Impact likely to occur
Moderate	Noticeable and viewed as important at a local scale. Impacts will possibly occur.	10-15% turnover change or numerous new job numbers. Impact will possibly occur.	10-15% turnover change. Impact will possibly occur.	Moderate visual impact and/or physical interruption. Impact will possibly occur.
Minor	Limited or very local impact. Impact unlikely to occur	5-10% turnover change or some new job numbers. Impact unlikely to occur.	5-10% turnover change. Impact unlikely to occur.	Minor visual impact and/or physical interruption. Impact unlikely to occur.
Negligible	Practically no local scale or wider impact. Impact highly unlikely to occur	<5% turnover change or very few new job numbers. Impact highly unlikely to occur.	<5% turnover change. Impact highly unlikely to occur.	Negligible visual impact and/or physical interruption. Impact highly unlikely to occur.
Positive	Direct benefit or enhancement to economic or perceived societal value of capital and natural resources			

Table 4 - Framework for assessing the magnitude of impact

The magnitude of impact includes a four-point scale of negatives ranging from negligible to Major (the 'Severe' category is not relevant to socio-economic impacts). A positive impact is also a potential conclusion.

The sensitivity of the receptor and magnitude of impact are combined to determine the consequences of the impact. There is no standard way prescribed by EIA regulations to assess the significance criteria in the above sensitivity and magnitude tables. The definition of overall significance based on these criteria is based on the professional judgement of the authors of the socio-economic impact assessment.

Potential impacts are assessed at three stages: construction and installation; operation and maintenance and; decommissioning.

1.3 Summary of relevant consultations and activities

A summary of the relevant consultations and activities is provided in the table below.

Date	Stakeholder	Consultation undertaken
Month, 2013	Royal Yachting Association (RYA)	Pre-scoping response raising issues about marking and lighting strategy to reduce collision risk. Referred to RYA Position Paper on Offshore Energy Developments
Month, 2014	Royal Yachting Association (RYA)	Position Paper on Offshore Energy Developments included in Scoping Opinion. Referred to pre-scoping comments
Month, 2014	Scottish Canoe Association (SCA)	SCA Renewable Energy Policy included in Scoping Opinion
Month, 2014	Marine Scotland	Scoping Opinion requested presentation of net socio-economic effects, especially with regards to GVA and employment. Will require clear consideration and use of the concepts of additionality, displacement, leakage and economic multipliers
Month, 2014	Historic Scotland	Scoping Opinion response stating that *"we do not consider that either the offshore or the onshore elements of the proposal are likely to have a significant impact on heritage assets within our remit"*
April to July, 2014	Offshore wind supply chain	Telephone survey targeting a cross-section of companies in the supply chain to identify capability, capacity and potential interest to supply the project
October, 2014	Local tourism and recreation organisations	Telephone and email contact with local organisations representing a range of tourism and recreation activities to seek views on potential impacts

1.4 Policy and strategic context

The Scottish Government's Low Carbon Economic Strategy[7] has an updated strategic objective to generate the equivalent of 100% of Scotland's own electricity demand from renewable resources by 2020 and increase the value of Scotland's low carbon goods and services sector to more than 10% of the Scottish economy by 2015 and in so doing create 60,000 green jobs.

The recently approved Aberdeen City and Shire Strategic Development Plan[8] includes an objective *'to be a city region which takes the lead in reducing the amount of carbon dioxide released into the air, adapts to the effects of climate change and limits the amount of non-renewable resources it uses'*. The strategy to achieve this objective includes *'increasing the supply of energy from renewable sources and reducing emissions of climate-change gases from existing power stations. As well as some extra capacity for offshore wind there is still considerable potential in offshore wind.'*

The plan has four strategic growth areas, including Aberdeen to Peterhead. This strategic growth area is already the focus of the Energetica project[9] of the Aberdeen City and Shire Economic Future partnership (ACSEF)[10]. The Energetica project includes key infrastructure developments such as the 55 acre Energetica Industry Park in Peterhead and the Peterhead to Tyneside subsea cable connection.

[7] http://www.scotland.gov.uk/Publications/2010/11/15085756/0
[8] http://www.aberdeencityandshire-sdpa.gov.uk
[9] http://www.energetica.uk.com/
[10] http://www.acsef.co.uk/

2. Socio-economic baseline

This section provides details of the baseline demographic and economic data to provide a context to the impact assessment. Key infrastructure in the area is described followed by a detailed analysis of the offshore wind supply chain present in Aberdeenshire and at a Scottish level. This section also contains baseline data for tourism and recreation in the Aberdeenshire area and specifically in the 30km radius area used for the impact assessment.

2.1 Socio-economic baseline

2.1.1 Comparison of key indicators

The availability of baseline data to compare key indicators at a local and Scottish level uses a combination of local authority level and national data. The local authorities of most relevance to the Peterhead area are Aberdeenshire and Aberdeen City, the boundaries of which are shown below.

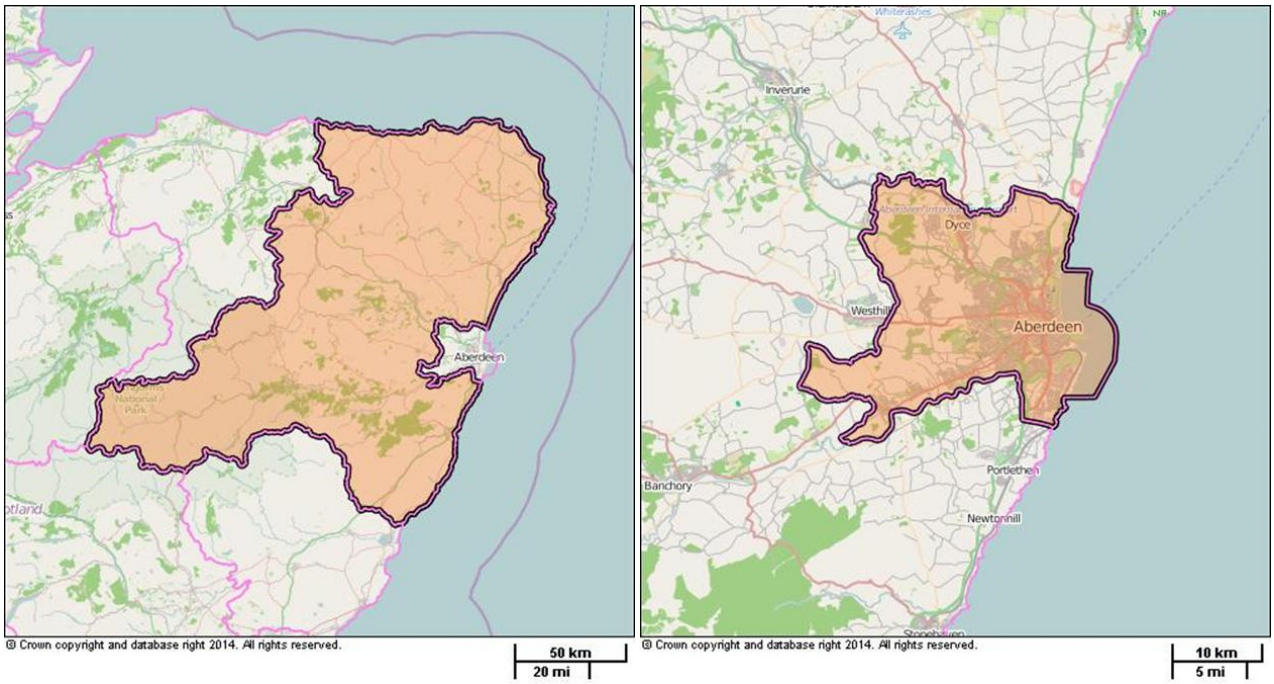

Figure 1 - Local authority boundaries relevant to the Peterhead and surrounding area[11]

Key population and other demographic data comparing Aberdeen shire, Aberdeen City and Scotland is shown in the figure below.

[11] Source: Scottish Neighbourhood Statistics – licensed under the Open Government Licence V2.0 - http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2/

Socio-economic baseline profile	Aberdeen City	Aberdeenshire	Scotland
Population			
Total Population: 2011	220,420	247,600	5,254,800
Total Population - Children (%): 2011	15.8%	18.9%	17.38%
Total Population - Working Age (%): 2011	67.1%	61.5%	62.79%
Total Population - Pensionable Age (%): 2011	17.1%	19.6%	19.80%
Economic Activity			
Percentage of total population who are income deprived: 2011	9.0%	7.0%	13.0%
Percentage of working age population who are employment deprived: 2011	9.0%	6.0%	13.0%

Table 5 - Comparison of key baseline demographic data (2011)[12]

Aberdeen City and Shire is home to a population of just under 470,000, representing 8.9% of the total population of Scotland. The urban Aberdeen City's working population is higher than the Scottish average with the more rural Aberdeenshire area having a slightly lower percentage of working population compared to the Scottish average. Both Aberdeenshire and Aberdeen City have significantly lower percentages of the population who are income deprived compared with the Scottish average. Likewise, the percentage of working age population who are employment derived are also significantly lower than the Scottish average.

This apparent difference in the socio-economic performance of Aberdeenshire and Aberdeen City relative to Scotland as a whole is consistent with the picture of business activity in these areas.

The figure below summarises the number of economic units (companies, businesses, etc.), employment numbers and gross value added of different business sectors.

[12] Scottish Neighbourhood Statistics – www.sns.gov.uk

Business Activity	Abdn City + Shire			Scotland			Abdn City + Shire as % of Scotland		
	No. of units	Total Emp (Th's)	GVA (£m)	No. of units	Total Emp (Th's)	GVA (£m)	No. of units	Total Emp (Th's)	GVA (£m)
Primary Industries	1,020	29.8	22,441.6	4,800	70.1	27,126.7	21.3%	42.5%	82.7%
Manufacturing	1,194	24.6	1,607.7	8,702	183.8	12,730.1	13.7%	13.4%	12.6%
Construction	2,128	13.7	900.3	18,713	127	6,111.4	11.4%	10.8%	14.7%
Wholesale, retail and repair	3,271	35.6	2,005.9	36,066	358.5	12,583.6	9.1%	9.9%	15.9%
Transport and storage	747	11.1	971.6	6,089	91.4	5,065.8	12.3%	12.1%	19.2%
Accomodation and food service	1,268	17.8	592.7	14,742	172	3,034.6	8.6%	10.3%	19.5%
Information and communication	753	4.2	333.5	8,232	54.6	3,043.6	9.1%	7.7%	11.0%
Insurance, reinsurance, professional, scientific and technical activities	6,243	35.5	2,850.6	26,526	164.4	14,916.6	23.5%	21.6%	19.1%
Real estate activities	500	3.1	137.4	5,444	32.2	1,380.0	9.2%	9.6%	10.0%
Administrative and support service activities	1,750	18	1,687.9	11,596	162.4	5,687.7	15.1%	11.1%	29.7%
Education, human health and social work activities	877	19.6	248.7	9,082	202.8	2,054.2	9.7%	9.7%	12.1%
Arts, entertainment and recreation	391	5	229.7	5,345	61	1,658.7	7.3%	8.2%	13.8%
Other service activities	840	3.5	165.6	8,277	36.4	881.7	10.1%	9.6%	18.8%
Total	**20,982**	**221.5**	**34,173.2**	**163,614**	**1716.6**	**96,274.7**	**12.8%**	**12.9%**	**35.5%**

Table 6 - Comparison of key sector indicators for Aberdeenshire, Aberdeen City and Scotland[13]

Even though Aberdeen City and Shire is home to 8.9% of the Scottish population it has a much higher proportion of businesses and employment (12.8% and 12.9%, respectively). In some sectors the importance to the Scottish economy of Aberdeen City and Shire (as measured by the proportion of gross value added (GVA) generated) is highly significant. Most notably, the two local authority areas account for 82.7% of Scottish GVA in primary industries. The most significant factor in this is obviously the North Sea oil and gas sector. Overall, Aberdeen City and Shire accounts for 35.5% of Scotland's GVA, again well in excess of its share of the population. This relatively high contribution to the national economy is also reflected in the relative percentage of the working age population claiming Job Seekers Allowance, as summarised in the table below.

[13] Scottish Annual Business Survey 2011, Scottish Government, 2013

Local Authority	January 2014	February 2014	% change
	Rate(%)	Rate(%)	
Aberdeen City	**1.5**	**1.5**	**0.0**
Aberdeenshire	0.9	0.9	0.0
Angus	2.2	2.2	0.0
Argyll & Bute	2.9	2.9	0.0
Clackmannanshire	4.5	4.5	0.0
Dumfries & Galloway	2.9	3.0	0.1
Dundee City	4.6	4.7	0.1
East Ayrshire	5.0	5.0	0.0
East Dunbartonshire	1.7	1.8	0.1
East Lothian	2.6	2.7	0.1
East Renfrewshire	1.7	1.7	0.0
Edinburgh, City of	2.7	2.7	0.0
Eilean Siar	2.9	2.9	0.0
Falkirk	3.8	3.8	0.0
Fife	3.6	3.7	0.1
Glasgow City	4.6	4.6	0.0
Highland	2.1	2.2	0.1
Inverclyde	4.0	4.1	0.1
Midlothian	3.2	3.1	-0.1
Moray	1.9	1.9	0.0
North Ayrshire	5.6	5.6	0.0
North Lanarkshire	4.3	4.3	0.0
Orkney Islands	1.1	1.2	0.1
Perth & Kinross	2.0	2.0	0.0
Renfrewshire	4.0	4.0	0.0
Scottish Borders	2.6	2.7	0.1
Shetland Islands	0.9	0.8	-0.1
South Ayrshire	3.9	3.8	-0.1
South Lanarkshire	3.6	3.6	0.0
Stirling	2.7	2.7	0.0
West Dunbartonshire	5.5	5.3	-0.2
West Lothian	3.0	3.1	0.1
Scotland	**3.3**	**3.3**	**0.0**

Source: Office for National Statistics

Table 7 - Job Seekers Allowance Claimant Count – Local Authority Comparison

The above data shows that Aberdeen City and Aberdeenshire local authorities have some of the lowest levels of the working age population claiming Job Seekers Allowance (1.5% and 0.9%). This is significantly below the Scottish average of 3.3% with only the Shetland Islands and Orkney Islands having lower or comparable rates.

2.1.2 Key infrastructure

As previously described in section 1.4, Peterhead is included in one of the four strategic growth areas outlined in the Aberdeen City and Shire Strategic Development Plan (Aberdeen to Peterhead area). Key infrastructure mentioned in this plan includes the existing Peterhead Port, with its deepwater facility, the planned development of the Energetica Industry Park and the installation of a subsea cable connection from Peterhead to Tyneside.

2.1.3 Baseline of the offshore wind supply chain

Nearly 800 companies have been identified in Scotland, an aggregation of businesses located within 50 miles, 100 miles and the rest of Scotland that are currently operating or have the

skills/capabilities to operate in the offshore wind supply chain. This was based on relevant SIC code definitions, employment and gross turnover data provided in the MINT UK database and a capability fit assessment with the offshore wind supply chain requirements carried out by Optimat Limited.

	50 Mile from Peterhead	100 Mile from Peterhead	Rest of Scotland	Total
No of Businesses	195	101	492	**788**
Turnover (£)	2,969,764	588,321	2,913,107	**£6,471,192**
Employment	9276	6436	38,286	**53,998**

Table 8 – Implement and Turnover of Scottish Offshore Wind Supply Chain

Most of the 788 companies identified would be new entrants into the Scottish offshore wind supply chain, where there is impact potential by the five turbine Hywind Scotland Pilot Park project. Around 25% of these are within 50 miles of Peterhead where there is already a strong oil & gas supply chain capability. Expanding the distance to 100 miles from Peterhead increases the supply chain capability and impact potential by an additional 101 companies or a further 13% of the total supply chain, including important port and harbour facilities such as Arbroath, Montrose, Dundee and Ardersier. The rest of Scotland accounts for about 62% of the Scottish supply chain that could potentially benefit from the project.

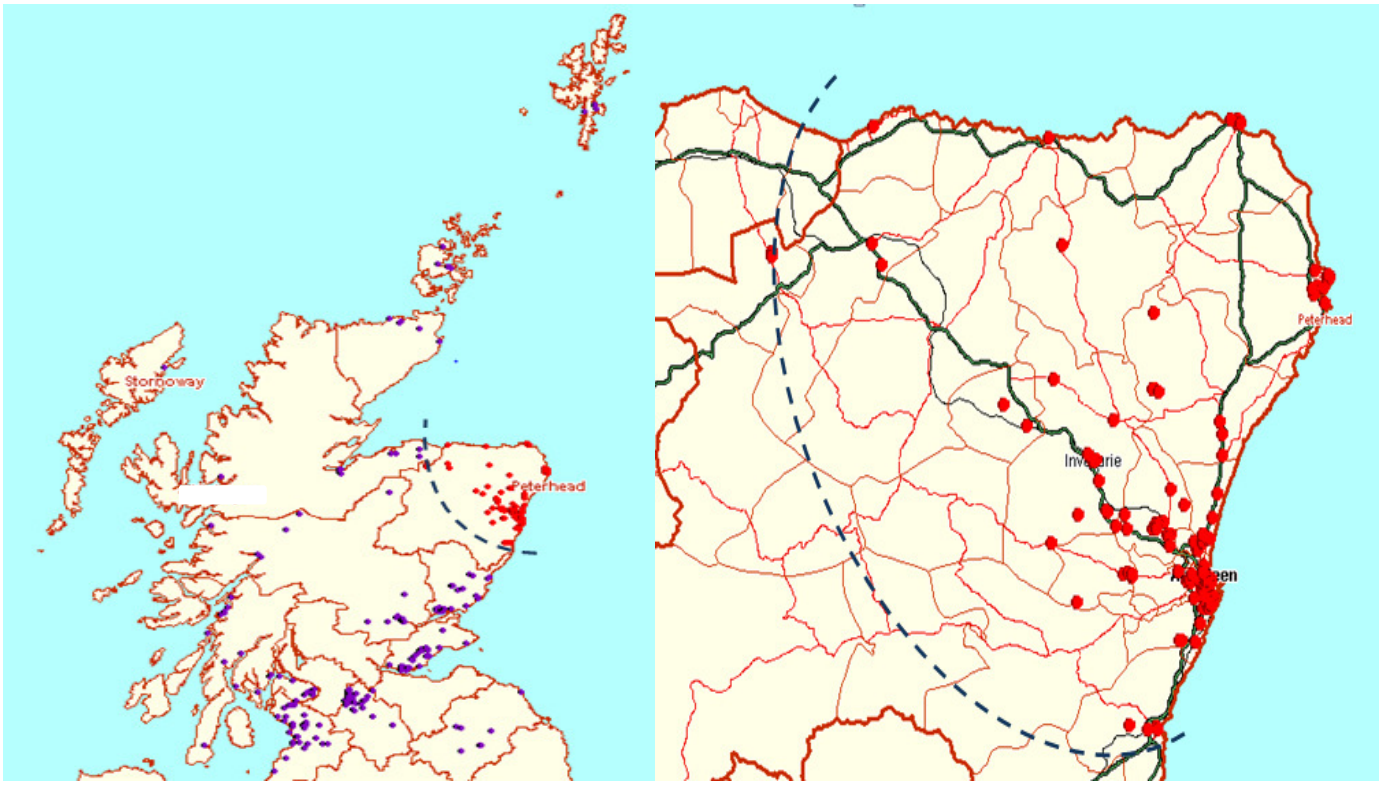

Figure 2 – Supply Chain Impact Potential (businesses within 50 mile and Scotland wide)

Business Activity			No of Businesses				
			50 Mile from Peterhead	100 Mile from Peterhead	Rest of Scotland	Total No Businesses	% of all Businesses
Construction & Installation	Development & Planning	Engineering design	15	4	31	50	6%
		Environmental impact assessments	11	4	25	40	5%
		Met Stations	1	1	1	3	<1%
		Geophysical/Geotechnical surveys	9	1	5	15	2%
	Wind Turbine	Manufacture of other fabricated metal products	0	0	4	4	<1%
		Nacelle	0	0	2	2	<1%
		Blades	0	0	0	0	0%
		Bedplate	0	0	0	0	0%
		Gearbox and drivetrain	0	0	0	0	0%
		Generator/rotor system	0	0	0	0	0%
		Tower manufacture	0	0	1	1	<1%
	Balance of Plant	Fabricated metal structures	45	25	226	296	38%
		Substructure/foundation fabrication	1	8	2	11	1%
		Mooring system fabrication	1	3	0	4	<1%
		Onshore/offshore substations	0	3	0	3	<1%
		Export cable manufacture	0	0	0	0	0%
		Electronic components and control systems	17	10	88	115	15%
	Installation	Turbine installation	2	0	0	2	<1%
		Foundation installation	2	0	0	2	<1%
		Tow out and lifting vessels	4	1	0	5	1%
		Subsea cable laying/installation	3	1	0	4	<1%
		Offshore substation installation	3	0	0	3	<1%
		Inshore construction/assembly ports	2	5	6	13	2%
Operation & Maintenance		Maintenance and repair services	18	6	20	44	6%
		Replacement equipment	5	2	8	15	2%
		Onshore repair/spares ports	3	7	10	20	3%
		Accommodation	3	2	24	29	4%
		Personnel transfer vessels	16	2	14	32	4%
		Installation / repair vessels	4	2	2	8	1%
Decommission		Design and engineering services	8	2	3	13	2%
		Marine lifting / crane vessels	0	1	4	5	1%
		Support vessels	4	1	8	13	2%
		Port facilities	2	5	6	13	2%
		Diving/ROV services	9	3	1	13	2%
		Environmental impact assessments	6	2	2	10	1%
		Total	25%	13%	62%	788	**100%**

Table 9 – Scottish Offshore Wind Supply Chain Capability

In terms of employment and gross turnover, which is mainly based on non-offshore wind business activity, companies in the Grampian area account for only 17% of the 54,000 employed across the Scottish supply chain, but disproportionally generate 46% of the gross turnover. This compares with 71% of employment in the rest of Scotland accounting for 45% of gross turnover, reflecting the greater proportion of higher value of oil & gas business carried out by companies in the Grampian area. Relevant skills, capability and capacity of companies for each phase eg construction & installation, operation & maintenance and eventual decommissioning of the Hywind Scotland Pilot project also varies across Scotland, shown in the following table.

2.1.4 Baseline of the tourism sector and recreational activities

Data regarding the baseline tourism sector in and around Peterhead are reported, by the national tourism organisation, VisitScotland and via business sector statistics presented at local authority level. The VisitScotland data is typically aggregated to the level of 'Aberdeen and Grampian' and the business sector analysis focuses on the Aberdeenshire and Aberdeen City local authorities. A breakdown of businesses involved in tourism and recreation was accessed from a combination of the MINT UK database[14] and the Dun & Bradstreet UK Trading File (accessed via Marketing File[15]). This is analysed locally around Peterhead using postal sector AB42, which provides the closest approximation of the 30km radius around the development site (although it covers a larger land area).

Additional information on recreational activities in the local area was identified by review of the VisitScotland website and general web searching. Finally, particular focus was given to the tourism and recreational facilities around the potential cable landfall and trenching route to the onshore switchgear yard (due to the specific potential impacts during the construction and installation phase).

2.1.4.1 Baseline of the regional tourism and recreation sector

Sustainable tourism[16] data for 2010[17] is shown in the figure below.

	Aberdeen City LA	Aberdeen City LA as % of Scotland	Aberdeenshire LA	Aberdeenshire LA as % of Scotland	Scotland
Total Employment (Th's)	10.1	5.6%	6.4	3.6%	180
Gross Value Added (£m)	339.3	11.0%	217.7	7.0%	3,091

Table 10 - Employment and GVA in the tourism sector in Aberdeen City and Aberdeenshire

Sustainable tourism employment in Aberdeen City and Aberdeenshire accounts for 16,900 jobs (10,300 in Aberdeen City and 6,600 in Aberdeenshire). This represents 9.2% of the total Scottish sustainable tourism employment (of 183,400). The GVA generated by these businesses accounts for 18% of the total Scottish sustainable tourism GVA figure. The average contribution of all businesses in Aberdeen City and Aberdeenshire local authority areas to Scottish GVA is 18.8% (see Table 11). This suggests that, like other areas of economic activity in this geographic area, sustainable tourism is a significant contributor to overall Scottish performance (particularly in the context that the population of Aberdeen City and Aberdeenshire represents 8.9% of the Scottish total).

A breakdown of tourism and recreation businesses for the AB postcode area[18] is shown in the figure below.

[14] http://www.bvdinfo.com/en-gb/products/company-information/national/mint-uk

[15] http://www.marketingfile.com/

[16] 'Sustainable tourism' represents the SIC 2007 industry classifications for tourism used within the Scottish Government's growth sector definitions

[17] As reported in 'Tourism in Scotland's Regions 2012' p.4, VisitScotland, September 2013

[18] Note that the majority of AB postcodes are within the boundaries of the Aberdeen City and Aberdeenshire local authorities

Tourism and recreation sub-sectors	SIC Code (2007)	Number in AB
Hotels and similar accomodation	55.1	322
Holiday and other short stay accomodation (incl. camping grounds etc.)	55.2 and 55.3	141
Restaurants and mobile food service activities	56.1	885
Beverage serving activities	56.3	78
Tour operator activities and other reservation service and related activities	79.12 and 79.9	14
Museum activities	91.02	15
Operation of historical sites and buildings and similar visitor attractions	91.03	42
Botanical and zoological gardens and nature resserve activities	91.04	1
Operation of sports facilities	93.11	57
Other sports activities (not incl. racehorse owners) nec	93.199	77
Activities of amusement parks and theme parks	93.21	10
Other amusement and recreation activities	93.29	165
	Total	**1807**

Table 11 - Number of businesses in the AB postcode area classified as sustainable tourism

As can be seen from the above figure, almost half of the businesses are restaurants and mobile food service activities, with hotels and similar accommodation being the next largest group (by number of units).

More details on key tourism attractions and recreational activities in the area are provided later in this section.

The baseline level of accommodation occupancy in Aberdeen and Grampian is summarised in the figure below[19].

[19] 'Tourism in Scotland's Regions 2012, VisitScotland, September 2013

Month	Accommodation Occupancy for Aberdeen and Grampian				
	Hotels	Guest Houses and B&Bs	Self Catering	Hostels	Caravan & Camping
January	58%	17%	21%	17%	
February	65%	40%	31%	33%	
March	65%	36%	25%	29%	
April	70%	36%	33%	41%	15%
May	75%	57%	47%	43%	23%
June	76%	59%	59%	44%	33%
July	77%	65%	68%	44%	37%
August	79%	66%	68%	56%	36%
September	81%	64%	66%	52%	24%
October	77%	48%	57%	43%	12%
November	70%	36%	32%	34%	
December	54%	26%	27%	27%	
Average	**71%**	**47%**	**44%**	**39%**	**33%**

Table 12 - Monthly occupancy rates for various accommodation types in Aberdeen and Grampian

The above figure demonstrates the availability of spare capacity (across Aberdeen and Grampian) throughout the year. Obviously there will be ranges of available capacity depending on the exact location. For example, occupancy rates in Aberdeen City may be higher due to the concentration of business tourism in this area[20].

Key tourism attractions and recreation activities in the study area

The tourism and recreation study area used in the impact assessment is based on a 30km radius from the proposed offshore development site. This radius intersects the coastline south of Cruden Bay and north of Rattray Head (east of the Loch of Strathbeg). It extends inland to cross the A950 approximately 5km west of Peterhead. The data on tourism and recreation activity described earlier are only available at local authority (Aberdeen City and Aberdeenshire) and regional (Aberdeen and Grampian) levels. Data on number of tourism and recreation businesses active in the area has been sources based on postcode boundaries. The figure below shows how the proxy postcode of AB42 compares with the 30km radius study area.

[20] http://www.bbc.co.uk/news/uk-scotland-scotland-business-18369280

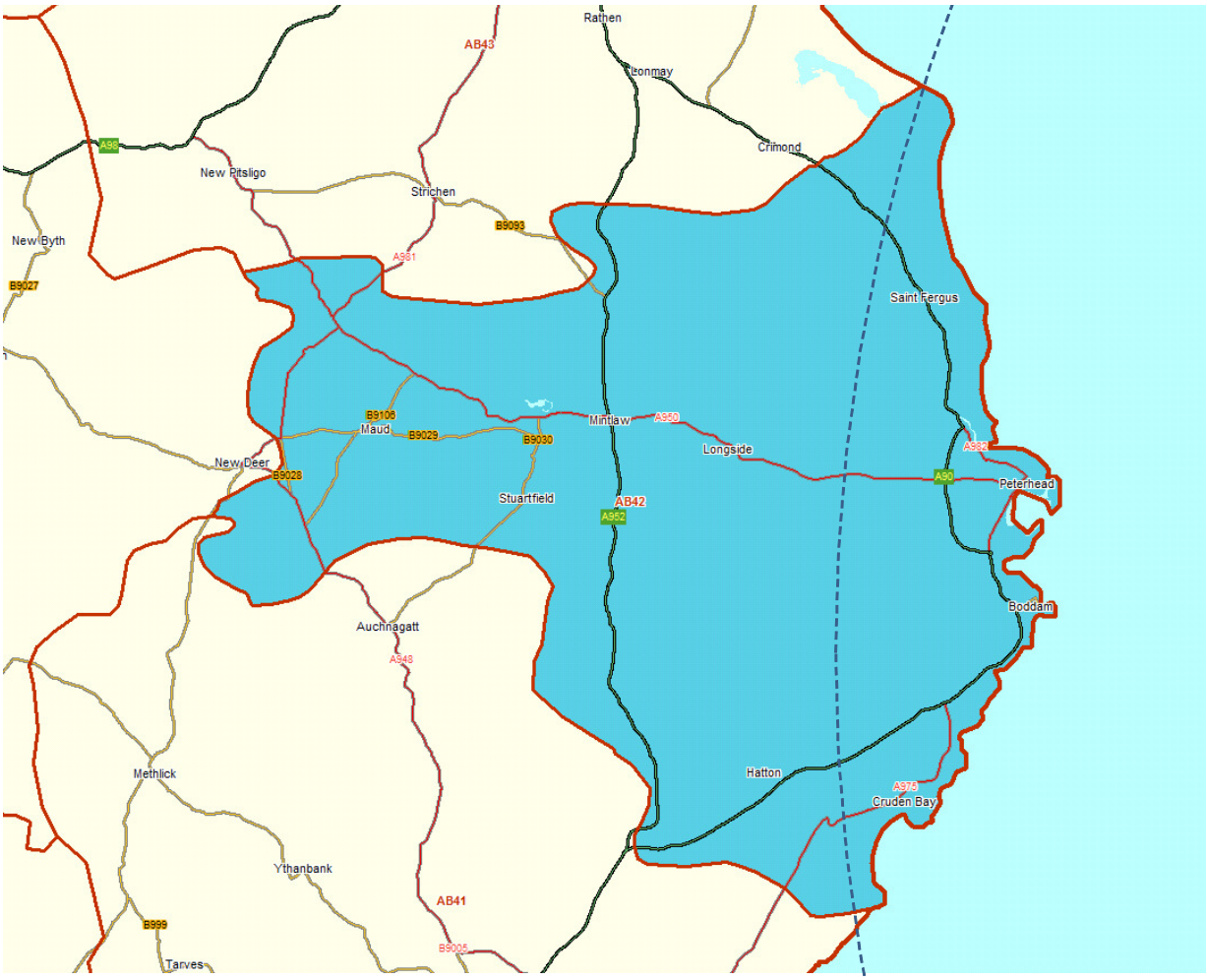

Figure 3 - AB42 postcode area - Peterhead[21] and indicative 30km radius (---) from proposed offshore development site

The number of tourism and recreation businesses operating in the AB42 area is shown in the figure below.

[21] Produced using GeoPlan Expert R52 mapping software

Tourism and recreation sub-sectors	SIC Code (2007)	Number in AB42
Hotels and similar accomodation	55.1	23
Holiday and other short stay accomodation (incl. camping grounds etc.)	55.2 and 55.3	11
Restaurants and mobile food service activities	56.1	51
Beverage serving activities	56.3	8
Tour operator activities and other reservation service and related activities	79.12 and 79.9	1
Museum activities	91.02	2
Operation of historical sites and buildings and similar visitor attractions	91.03	0
Botanical and zoological gardens and nature resserve activities	91.04	0
Operation of sports facilities	93.11	2
Other sports activities (not incl. racehorse owners) nec	93.199	5
Activities of amusement parks and theme parks	93.21	0
Other amusement and recreation activities	93.29	15
	Total	**118**

Table 13 - Tourism and recreation businesses operating in the AB42 postcode area

Clearly, only a sub-set of these businesses operate within the 30km study area.

The 30km radius of the study area contains the following tourism and recreation sites and activities:

- Visitor attractions including the Slains Castle and the Arbuthnot Museum in Peterhead (showcasing historical aspects of the areas fishing, shipping and whaling background);
- A number of hotels, guest houses and other accommodation and restaurants in Cruden Bay, Boddam and Peterhead;
- A network of coastal paths running the length of the coastline in the study area. This attracts tourism and recreation visitors with interests in walking, bird watching and other wildlife watching (including marine wildlife such as seals, bottle-nose dolphins and occasionally killer whales). The East Grampian Coastal Partnership is active in the study area;
- Walking and cycling is an important recreational activity with the Formartime and Buchan Way being one of the more well known inland routes in the area. This route has a branch off from Maud to Peterhead (via Longside) which is suitable for both walking and cycling. Peterhead was designated as a pilot Cycle Demonstration Town in 2008 by Aberdeenshire Council. The project has recently received further development funding from Sustrans to continue developing the cycling infrastructure in the area;
- A number of cruise and charter boats operate from bases around the North East coastline targeting visitors with wildlife interests;
- Peterhead Golf Club and Cruden Bay Golf Club are both located in the study area (modelling work on the Zone of Theoretical Visibility – conducted as part of the wider Environmental Statement – suggests that the proposed turbines will be visible from the course in Peterhead and part of the course in Cruden Bay);
- Recreational boating with a local base at Peterhead Sailing Club (although recreational boats from other areas can be included in the scope);

- Recreational angling from shore and boat is a popular activity around most coastal areas in Scotland, with most activity being within 6nm of the coastline[22]. Buchan Beach Angling Club hosts a number of competitions in the area;
- A range of water sports also form part of the recreational activities in the area. These include sub-aqua diving of a significant number of wreck sites off the coast of Peterhead, with groups such as Buchan Divers active in the area. There is some surfing/windsurfing and sea/surf kayaking activity along the North East coastline with some activity in Cruden Bay. Peterhead Canoe Club provides a local focus for kayaking activities.
- Close to the proposed cable landfall site is the local recreation ground of Barclay Park

2.1.5 Baseline data gaps and uncertainties

The geographical area covered by data sources for employment and gross value added are available for local authority and regional tourism level. Individual businesses have been identified using postcode area AB42. All of these geographical areas are larger than the 30km study area. The lack of secondary information sources about employment and gross value added mapping onto the exact are covered in the tourism and recreation study has meant that quantitative information about the baseline position is a 'best fit', but can only be indicative.

[22] 'Economic Assessment of Short Term Options for Offshore Wind Energy in Scottish Territorial Waters: Costs and Benefits to Other Marine Users and Interests', Marine Scotland, 2011, p.42, section 3.9

3. Impact assessment

This section includes the assessment of impacts directly on the economy, through the supply chain and on tourism and recreation activities. The impacts are considered at construction and installation phase, operation and maintenance and decommissioning.

3.1 Scope of impact assessment

This impact assessment deals with the Project in the medium to longer term, however, the impact could be significantly greater. This is due to the greater opportunity presented to the Scottish supply chain through a potential full commercial scale offshore wind development utilising floating turbines. Given that this is a new type of floating offshore turbine there is the potential for the Scottish supply chain to become a leader in the construction, installation, operation and maintenance and decommissioning. Although not arising immediately as a result of this development it is a necessary stepping stone to achieving far greater potential economic benefits.

The principal potential impacts resulting from the project are categorised as:

- Direct economic impacts eg employment and gross value added (GVA) related to with construction & installation, operation & maintenance and final decommissioning of the pilot turbines
- Indirect economic impacts eg employment and GVA generated in the economy of the study area by the supply chain related to the direct activities eg construction, installation, operation and final decommissioning
- Induced economic impacts eg employment and GVA created by direct and indirect employment spending in the Grampian area and wider Scottish economy.
- Wider economic impacts eg employment and income generated in the economy resulting from the project influencing economic activities and wider effects on inward investment
- Impacts on existing tourism and recreational activities. The tourism and recreation impacts are considered within a 30km radius around the proposed development site
- Increased tourism/business interest resulting from the proposed development site becoming a tourist attraction

There is considerable potential for costs differences between a generic fixed wind farm and floating wind farms. For example, installation and decommissioning are less than for floating turbines and access issues during O&M could have a significant impact on costs. The total capital expenditure assumptions for the Project is **£150 million**, equating to £5 million per MW installed and **£100 million** operational spend over a 20 year timescale, based on £5 million per annum average spend has been used for the impact assessment. This has been undertaken in accordance with Scottish Enterprise's economic impact assessment and additionality guidance[23], the HM Treasury Green Book guidance[24] and the Scottish Government Annual Statistics[25].

[23] www.scottish-enterprise.com/sedotcom_home/about-us/research-publications/evaluations-impact.htm

The following cost assumptions were used in the assessment based on Statoil projections for the different activities.

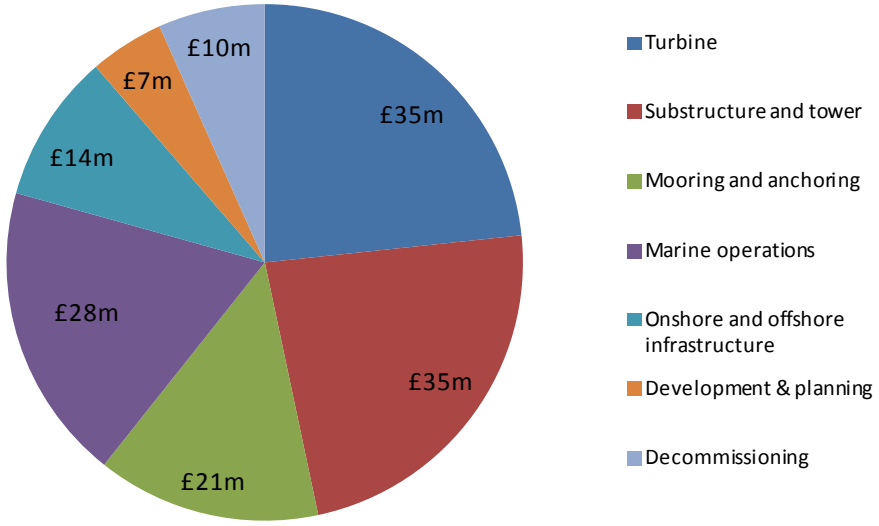

Figure 4 – Estimated Capex breakdown for the Hywind Scotland pilot project

Included in the total capital spend is £10 million for decommissioning and £14 million onshore construction activity associated with civil engineering and build of the onshore substation and cable termination.

An overall total project capital spend of **£150m** has been used for this impact assessment. The assumptions and multipliers used to assess the economic impact from the Project in accordance with Scottish Enterprise's guidelines are shown below in Table 14.

Factor	Multiplier
Expenditure:GVA ratio	x2.5
GVA per employee ratio	£71,033
Deadweight	0%
Leakage	10% to 100%
GVA multiplier	1.56
Employment multiplier	1.55
Displacement	0 to 10%

Table 14 – Economic impact factors and multipliers

[24] www.hm-treasury.gov.uk/data_greenbook_supguidance.htm
[25] http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/IOAllFiles2007

A breakdown of the economic impacts eg jobs created and GVA generated during the construction, installation, operation and decommissioning of the Project are described in the following sections.

3.1.1 Data gaps and uncertainties

The consultation phase, with regional and local tourism and recreation organisations, commenced in October 2014. To maximise the effectiveness of this consultation it was agreed to approach these stakeholders once information became available on the Zone of Theoretical Visibility (drafts became available in September 2014). Several of the organisations approached stated they had to refer to members (either directly or via committees) and this has resulted in the consultation stage being ongoing at the time of writing. The impact assessment therefore uses the best available information at the time of writing.

3.2 Construction and installation impacts

There is a mix of direct impacts from the temporary construction workforce related to onshore and offshore and onsite civil works, temporary roads, construction of the works facility at Peterhead and indirect impacts on the supply chain, both locally and across Scotland. Most of the construction or assembly of the turbines is expected to be carried out at an assembly site somewhere in Scotland and floated into position for installation off Peterhead, with the main fabrication of the towers and substructure carried out by the supply chain elsewhere.

3.2.1 Impact 19.1 Potential direct impacts on employment and GVA

The total direct impacts from onshore and offshore infrastructure development eg temporary construction and cable to grid connection activity are estimated to be approximately 10% of total capex **(£14m)**.

Activity	Capital Spend	Direct GVA £m (TO/GVA Ratio 2.5 & 10% leakage)	Direct Jobs Supported (temporary)	Net Direct Jobs Supported (FTE Jobs)
Onshore and offshore construction infrastructure work	£14m	£5.6m	78	39

Table 15 – Direct economic impact from onshore construction

Based on a Turnover/GVA ratio of 2.5, the total direct potential impacts from the Project are estimated to be **£5.6m GVA** and 78 temporary jobs over two years, equivalent to **35 FTE** jobs.

3.2.2 Impact 19.2 Potential indirect supply chain impacts on employment and GVA

Most of the jobs and GVA during construction and installation will be generated indirectly in the supply chain related to development & planning, wind turbines, balance of plant supply and offshore installation. This will include fabrication and supply of the big cost items such as the substructures, towers, turbine, nacelle and inter array/export cable manufacture. The total Project spend, excluding direct construction work and jobs, could potentially support an estimated 710 temporary jobs over a two year timeframe equivalent to around 355 FTE jobs if all of the work was carried out in Scotland. A breakdown of the indirect impact potential on capital spend in and jobs creation in the supply chain during the construction and installation phase of the Project is summarised in Table 16 as follows.

Activity	Capital Spend	Indirect GVA £m (TO/GVA Ratio 2.5 & 10% leakage)	Indirect Jobs Supported (temporary)	Net Indirect Jobs Supported (FTE Jobs)
Development & planning	£7m	£2.52m	35	22
Turbine	£35m	£0m	0	0
Moorings and anchoring	£21m	£7.56m	106	63
Substructure and tower	£35m	£12.6m	177	62
Marine operations	£28m	£8.28m	117	69
Total	**£126m**	**£30.96m**	**436**	**218**

Table 16 – Indirect economic impact potential from construction, assembly and installation

The Project is estimated to generate **436** temporary or **218 FTE jobs** and nearly **£31m GVA** indirectly in the supply chain during construction and installation. This assumes all turbines and heavy lift vessels being supplied from outside Scotland (eg Scenario 1) and assumes limited leakage (~10%) of the remaining capital spend outside of Scotland, which have been excluded from the figures in Table 16.

In terms of absorption capacity of the local supply chain, 218 FTE jobs supported over two years would represent only 2% of existing employment in nearly 200 potential local suppliers within 50 miles of Peterhead and less than 1% of employment in potential suppliers across Scotland. Results from the supply chain survey show the markets served by local companies are a good fit with the Project and offer significant capacity and skills within Aberdeenshire to absorb 218 FTE jobs over two years.

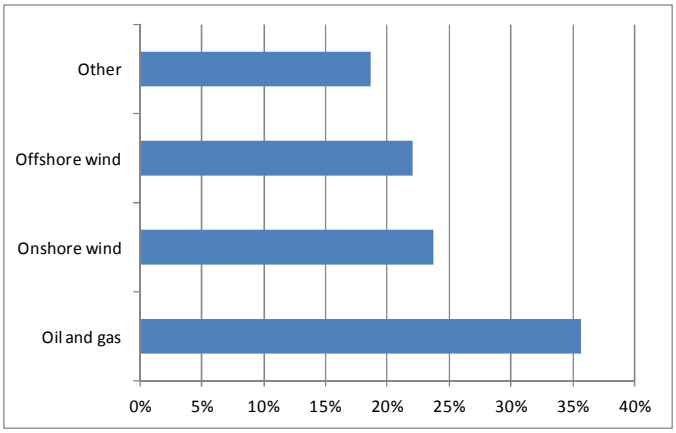

Figure 5 – Market sectors served by local companies

Responses from companies when asked what the overall impact of supplying the project would have on employment levels in their businesses are shown below.

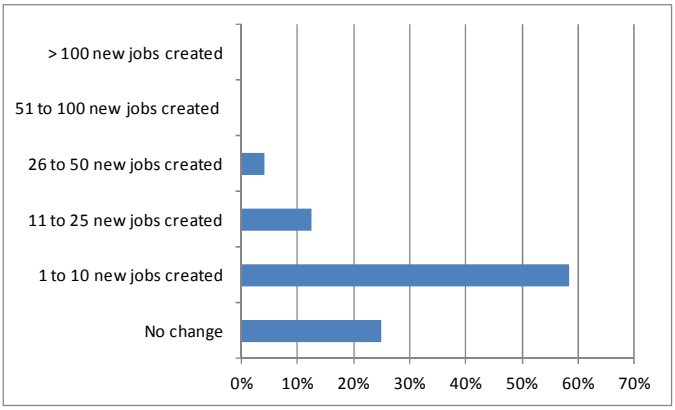

Figure 6 – Employment impacts on local supplier companies

Feedback indicates a 25% absorption rate with 75% of businesses having to recruit additional people to supply the Project, depending upon how much work they could secure. This would generate net additional jobs in the region as a result of the Project.

3.2.3 Impact 19.3 Potential induced impacts during construction and installation

Economic impacts eg employment and GVA created by direct and indirect employment spending in the Grampian area and wider Scottish economy will have a knock-on effects or induced impact on the local economy. Two multipliers have been used to calculate the average induced economic benefits resulting from direct and indirect construction and installation work, in accordance with Scottish Government guidelines eg employment multiplier of 1.55 and GVA multiplier of 1.56. The induced impacts from construction and installation will only be temporary over a two year project timeframe are summarised below.

Direct & Indirect Jobs (FTE)	Direct & Indirect GVA £m	Induced FTE Jobs (multiplier x 1.55)	Induced GVA (multiplier x 1.56)
257	£37	75	£21m

Table 17 – Induced economic impact potential during construction and installation

The potential induced economic impacts generated during all construction and installation of the Project is estimated to be around **75 FTE jobs** and **£21m GVA**.

Impact significance

The levels significance of the potential to create nearly 78 direct FTE jobs/£5.6m GVA and 218 indirect FTE jobs/£31m GVA during construction and installation over two years would be considered as a minor impact, but nevertheless have some significance at a local Aberdeenshire level. The Project will also have the potential to induce 75 additional jobs and £21m GVA in the Aberdeenshire and wider Scottish economy.

The sensitivity, impact magnitude, consequence and impact significance of each receptor during construction and installation is assessed as follows.

(Direct impact employment and GVA: Impact significance)

Assessment of impact significance

The sensitivity of the receptor is considered to be not applicable for economic factors, although magnitude of impact is considered minor with 78 direct jobs created. These jobs will only last two years during construction and therefore will have a minor overall consequence, but are still significant.

Sensitivity of receptor	Magnitude of impact	Consequence
N/A	Moderate	Moderate
Impact significance – SIGNIFICANT		

(In-direct impact employment and GVA: Impact significance)

Assessment of impact significance

The sensitivity of the receptor is considered to be not applicable for economic factors. However, the magnitude of impact is considered minor with 218 indirect FTE jobs created and £31m GVA generated as major areas items such as turbines, substructures and towers could be constructed outside Scotland. The overall consequence is therefore judged to be of minor although still significant for the development of the offshore wind supply industry in Scotland.

Sensitivity of receptor	Magnitude of impact	Consequence
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

Overall, the local Aberdeenshire economy will be less sensitive to the impacts due to the strong oil & gas supply chain capability and therefore of consequence to the region. There is existing local capability and supply chain absorption capacity to accommodate around 370 FTE jobs over two years. There will also be negligible impacts in other Scottish regions, where there are key supplier or infrastructure assets such fabrication yards and ports.

It should be noted that strong supply chain company interest in Aberdeenshire and across Scotland was expressed during the survey to supply goods and services for the Project. Although these will require full vendor assessment, they could provide a basis for a supply chain development plan.

3.2.4 Impact 19.4 Wider economic impacts

During the construction and installation of the Project turbines Scottish companies will develop skills and capabilities that will benefit the local economy in the longer term. For example this could include development of engineering design and construction skills for large floating structures and development on new installation techniques.

(Wider economic impact employment: Impact significance)

Assessment of impact significance

The sensitivity of the receptor is considered to be not applicable for economic factors. New skills and capabilities This could provide the Scottish suppliers with a competitive advantage in future floating offshore wind farms. There is also potential to transfer these skills and develop commercial benefits into other sectors such as the wider offshore wind and marine energy (ie wave and tidal), where anchoring of marine devices is a major challenge. The presence of a skilled workforce and supply chain will also important for attracting inward investors into Scotland. However, the overall consequence is therefore judged to be of minor although still significant for the development of the offshore wind supply industry in Scotland.

Sensitivity of receptor	Magnitude of impact	Consequence
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

Impact on wider offshore wind and marine energy is most likely to be in specific areas such as engineering design, fabrication and installation for floating structures such as wave energy generators in severe service environments.

3.2.5 Potential for inward investment

There are major gaps in Scottish supply chain that potentially could have significant economic impact on Scotland. International wind turbine companies such as Gamesa and Samsung have already established a base in Scotland, although there is currently no turbine manufacturing facilities and only Siemens has announced setting a turbine manufacturing facility in England. Recent announcements of other offshore wind projects in Scotland eg Beatrice and Moray Firth

could attract new inward investment from companies such as Vestas and MHI that could also benefit the Project.

Turbine manufacturers may also consider setting up dockside turbine assembly facilities in Scotland if they win offshore wind turbine contracts. Inward investment by turbine manufacturers is also likely to attract major overseas turbine component suppliers of turbine blades, large cast bedplates and hubs etc. One Finnish company interviewed during this study is looking to set up a foundry in Scotland to supply very large castings.

In addition to turbines, supply gaps exist in balance of plant for items such as towers, large fabricated substructures and subsea power cables that offer potential inward investment opportunities. For example there is currently no manufacturers of towers for offshore wind turbines in Scotland or the UK, where there is potential to develop the capability in Wind Towers Ltd in Campbeltown or attract an inward investor. A similar situation exists for fabrication of the 8 metre diameter substructures where there is potential to expand facilities at Wind Towers and existing fabrication yards or attract inward investors to set up facilities in Scotland.

Although the five towers and substructures alone is not likely to attract an inward investor the prospect of the full commercial Project, Beatrice and the Moray Firth projects could collectively account for more than 500 towers over the next five to ten years and be more attractive inward investor interest.

Supply chain gaps also exist in subsea power cable manufacture, where there is also GDR array cable manufacturers in North East England. There is no export cable manufacturer in the UK, although it is likely to be difficult to attract overseas companies such as Nexans to set up in Scotland.

3.2.6 Impact 19.5 Existing tourism and recreational activities during construction and installation

The tourism and recreation receptors relevant to the 30km radius area of the impact assessment include:

- Accommodation and restaurant providers in Boddam
- Accommodation and restaurant providers in Cruden Bay
- Accommodation and restaurant providers in Peterhead
- Arbuthnot Museum
- Barclay Park
- Costal paths
- Cruden Bay Golf Club
- Formartine and Buchan Way (Peterhead branch)
- Peterhead Golf Club
- Recreational sailing
- Sea angling (shore and boat)

- Sea/surf kayaking
- Slains Castle
- Sub-aqua diving
- Surfing/windsurfing
- Wildlife cruise and charter boats

The sensitivity, impact magnitude, consequence and impact significance of each receptor is assessed below.

(Accommodation and restaurant providers in Boddam: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Accommodation and restaurant providers in Cruden Bay: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Accommodation and restaurant providers in Peterhead: Impact significance)

There may be a positive local impact for accommodation and restaurant providers in Peterhead connected to the cable landfall works.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered positive with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Positive	Minor
Impact significance – NOT SIGNIFICANT		

(Arbuthnot Museum: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Barclay Park: Impact significance)

Barclay Park is located along the potential cable landfall route. It is a recreational amenity site for local residents and may be temporarily disrupted during laying of cable from landfall to sub-station.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered moderate with an overall consequence of moderate and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Moderate	Minor
Impact significance – NOT SIGNIFICANT		

(Coastal paths: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered medium, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Cruden Bay Golf Club: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered very high, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Very high	Negligible	Negligible

Impact significance – NOT SIGNIFICANT

(Formatine and Buchan Way: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered medium, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Peterhead Golf Club: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered medium, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Recreational sailing: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Sea angling (shore and boat): Impact significance)

The shoreline at the cable landfall area (off Gadle Braes) is not a significant area for shore angling. The works related to cable landfall are not, therefore, expected to have a significant impact.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**

Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Sea/surf kayaking: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Slains Castle: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered medium, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Sub-aqua diving: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Surfing/Windsurfing: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**

Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Wildlife cruise and charter boats: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

MITIGATION RELATING TO IMPACT 19.5
It has been concluded from the assessment that there will be no significant impacts on the basis that the following measures were incorporated into the design of the Project in order to remove or reduce any likely significant effects: > During temporary cable landfall works consultation will take place with local businesses and providers of recreational facilities to minimise disruption relating to access and use of facilities Based on specific measures included in Project design no further mitigation measures are required.

3.2.7 Impact 19.6 Increased tourism/ business interest during construction and installation

The potential for increased tourism and business interest directly related to the proposed development site is based on the growth of boat tours to the Hywind demonstrator based 10 km off the south-west coast of Norway.

(Hywind pilot park tourism: Impact significance)

This potential impact will not occur until the proposed development is operational.

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

MITIGATION RELATING TO IMPACT 19.6
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant

3.3 Operation and maintenance impacts

3.3.1 Impact 19.7 Potential impacts on direct employment and Gross Value Added

Ernst & Young derived generic figures (ref [24]) for offshore wind Opex of around £79k/MW/yr which is equivalent to an average annual spend of an estimated £2.37m every year over the project life or a total project opex of £47m (32%) of the total project costs. This equates to a direct GVA of £18.8m over a 20 year timeframe using a Turnover:GVA ratio of 1:2.5. This is lower than statoil cost assumptions of **£5m** per year. Various estimates are used to calculate direct employment related to operation and maintenance of offshore wind farms. Assumptions used for this analysis was based on 0.5 jobs/MW (ref [24]) which is equivalent to 15 FTE long term jobs, which is similar to 16.5 FTE long term jobs based on £79k/MW/yr. As only 5 turbines involved in the Project and increasing use of remote condition monitoring the lower direct employment figure eg **12 FTE jobs** is predicted. This is similar to Statoil's estimated manning levels of 10-12 with 8-10 in the Peterhead area. Grid tariffs and local fees are also included in the costs, estimated to be around £0.35m per year paid to the power network operator.

3.3.2 Impact 19.8 Potential supply chain impacts

Indirect economic impacts in terms of employment and GVA generated in the local Grampian economy through the supply chain of goods and services procured during operation and maintenance activities. If labour is excluded then supply chain spend covering materials and services is estimated to be 66% of total opex eg £3.3m per year over the 20 year project timeframe. With operation and maintenance most likely to be managed from Peterhead or Aberdeen, the majority of opex will impact on the local economy.

Activity	Indirect Opex £m Per year	Indirect GVA £m Per year	Indirect Jobs Supported Per year (FTE Jobs)
O&M services	£3.3m	£1.32m	15

Table 18 - Indirect supply chain impacts during repair & maintenance

Indirect impacts on the supply chain is estimated to be 15 FTE jobs supported per year supported in the supply chain over the lifetime of the Project. For example these could include jobs created in maintenance contractors, charter vessel companies, onshore storage facility providers. The estimated total combined direct and indirect impacts are around **£2m GVA** per year and **27 FTE jobs.** The following factors have been applied to these baseline figures:

- *displacement* – does the Pilot Park project lead to a reduction of economic impact elsewhere in the economy eg will it develop at the expense of other offshore wind projects in Scotland
- *leakage* – this is covered by asking where supplies will be purchased and the residence of employees
- *dead-weight* – additional benefits as a direct result of the Hywind Scotland pilot project

Factor	Assumptions	Total
Estimated direct and indirect supply chain Jobs	-	27
Dead weight	0	-
Leakage	10%	3
Displacement	10%	3
Total jobs supported/yr	-	21
Total GVA/yr	1:1.25	£1.6m

Table 19 – Direct and indirect economic impacts during operational and maintenance

The project will generate around **£1.6m GVA per annum** and support nearly **21 FTE local** direct and indirect jobs during operation and maintenance over the lifetime of the Project.

3.3.3 Impact 19.9 Potential induced impacts during operation and maintenance

Economic impacts eg employment and GVA created by direct and indirect employment spending in the Grampian area and wider Scottish economy will have knock-on effects or induced impact on the local economy through increased spend in local businesses. Two multipliers have been used to calculate the average induced economic benefits across during construction and installation, in accordance with Scottish Government guidelines eg employment multiplier of 1.55 and GVA multiplier of 1.56. The induced impacts from construction and installation will be temporary over the two year project timeframe are summarised below.

Direct & Indirect Jobs (FTE)	Direct & Indirect GVA £m	Induced FTE Jobs (multiplier x 1.55)	Induced GVA (multiplier x 1.56)
21 jobs	£1.6m	12 jobs	£0.9m

Table 20 – Induced economic impact potential during construction and installation

The net additional induced economic impacts on the wider economy generated during operation and maintenance spend of the Project are estimated to be **12 FTE jobs** and **£0.9m GVA** per annum.

Overall economic impacts from operation and maintenance activities over a 20 year lifetime of the Project are summarised below.

Impact	Total jobs supported per annum (FTEs)	Total GVA Per year (£m)
Direct and indirect	21	£1.6m
Induced	12	£0.9m
Total	**33**	**£2.5m**

Table 21 – Total economic impact potential during operations and maintenance

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during operation and maintenance is assessed as follows.

(Direct impact employment and GVA during O&M: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered to be not applicable for economic factors, although magnitude of impact is considered minor with 9 direct FTE jobs created over the 20 project timescale generating an estimated £720k per year. This will have a minor overall impact and consequence, but are still significant for the Peterhead area.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

(In-direct impact employment and GVA during O&M: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered to be not applicable for economic factors. However, the magnitude of impact is considered minor with 21 indirect FTE jobs created and £850k GVA generated each year over the 20 life of the project. The overall consequence is therefore judged to be of minor although still significant for the Scottish supply chain.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

3.3.4 Impact 19.10 Wider economic impacts

O&M skills and capabilities developed to supply the Project could benefit the growing marine energy sector, where there are significant operational and maintenance challenges.

Innovation in remote monitoring at Aberdeen University will benefit the Project and can be transferrable into other energy sectors.

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during operation and maintenance is assessed as follows.

(Induced impact on employment and GVA during O&M: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered to be not applicable for economic factors, although magnitude of impact is considered minor with on 12 induced FTE jobs and £0.9m created in the local economy and are therefore significant for the Peterhead area.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

3.3.5 Impact 19.11 Potential for inward investment

Limited scope to attract new inward investment without displacing existing local companies. This is due to the strong operation and maintenance supply chain capability in Aberdeenshire supplying the offshore oil & gas sector.

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during operation and maintenance is assessed as follows.

(Potential for Inward investment during O&M: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered to be not applicable for economic factors. Although magnitude of impact is considered minor, attracting an experienced offshore wind maintenance contractor would benefit the local economy. However, the scale of opportunity in the five turbine Project may not warrant setting up a new facility and is therefore judged to be of minor impact and consequence, but have significance.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

3.3.6 Impact 19.12 Existing tourism and recreational activities during operation and maintenance

The tourism and recreation receptors relevant to the 30km radius area of the impact assessment include:

- Accommodation and restaurant providers in Boddam
- Accommodation and restaurant providers in Cruden Bay
- Accommodation and restaurant providers in Peterhead
- Arbuthnot Museum
- Barclay Park
- Costal paths
- Cruden Bay Golf Club
- Formartine and Buchan Way (Peterhead branch)
- Peterhead Golf Club
- Recreational sailing
- Sea angling (shore and boat)
- Sea/surf kayaking
- Slains Castle
- Sub-aqua diving
- Surfing/windsurfing
- Wildlife cruise and charter boats

The sensitivity, impact magnitude, consequence and impact significance of each receptor is assessed below.

(Accommodation and restaurant providers in Boddam: Impact significance)

Potential impacts include loss of scenic view quality reducing visitor numbers.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Accommodation and restaurant providers in Cruden Bay: Impact significance)

Potential impacts include loss of scenic view quality reducing visitor numbers.

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Accommodation and restaurant providers in Peterhead: Impact significance)

Potential impacts include loss of scenic view quality reducing visitor numbers.

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Arbuthnot Museum: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Barclay Park: Impact significance)

Barclay Park is located along the potential cable landfall route and as such is unlikely to experience any disruption once installation is complete.

Assessment of impact significance		
The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Coastal paths: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who do use the paths. Draft Zone of Theoretical Visibility modelling suggests that the turbines will be visible from most points along the coastline within the 30 km radius of the impact assessment.

Assessment of impact significance		
The sensitivity of the receptor is considered medium, magnitude of impact is considered minor with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Minor	Minor
Impact significance – NOT SIGNIFICANT		

(Cruden Bay Golf Club: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in visitors to the course and loss of amenity for those who do use the course. Draft Zone of Theoretical Visibility modelling suggests that the turbines will be visible from the south part of the course but not the north.

Assessment of impact significance		
The sensitivity of the receptor is considered very high, magnitude of impact is considered minor with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Very high	Minor	Minor
Impact significance – Not SIGNIFICANT		

(Formatine and Buchan Way: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who walk this route. Draft Zone of Theoretical Visibility modelling suggests that the turbines will be visible from the path running into Peterhead.

Assessment of impact significance		
The sensitivity of the receptor is considered medium, magnitude of impact is considered minor with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Minor	Minor
Impact significance – NOT SIGNIFICANT		

(Peterhead Golf Club: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in visitors to the course and loss of amenity for those who do use the course. Draft Zone of Theoretical Visibility modelling suggests that the turbines will be visible from most (if not all) of the course.

Assessment of impact significance The sensitivity of the receptor is considered medium, magnitude of impact is considered minor with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Minor	Minor
Impact significance – NOT SIGNIFICANT		

(Recreational sailing: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational sailing users and loss of amenity for those who do sail in the 30 km radius. The collision risk for recreational boats is also a potential impact. The area is not a significant recreational boating site, relative to activity in other areas of the Scottish coast.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Sea angling (shore and boat): Impact significance)

Potential impacts include loss of fishing locations. However, the Buchan Deeps area is not commonly used for recreational fishing due to the significant distance from shore.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Sea/surf kayaking: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who kayak in this area. Cruden Bay is used for this activity. The proposed development site is too far from shore to be used for this purpose and would not, therefore cause disruption.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Slains Castle: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who visit the castle. Draft Zone of Theoretical Visibility modelling suggests that the turbines will be visible from Slaines Castle.

Assessment of impact significance The sensitivity of the receptor is considered medium, magnitude of impact is considered minor with an overall consequence of minor and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Medium	Minor	Minor
Impact significance – NOT SIGNIFICANT		

(Sub-aqua diving: Impact significance)

Potential impacts include loss of access to dive sites. Recreational diving in the 30km radius tends to occur nearer to shore in shallower waters.

Assessment of impact significance The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Surfing/Windsurfing: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who surf/windsurf in this area. The proposed development site is too far from shore to be used for this purpose and would not, therefore cause disruption.

Assessment of impact significance

The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.

Sensitivity of receptor	Magnitude of impact	Consequence
Low	Negligible	Negligible
Impact significance – NOT SIGNIFICANT		

(Wildlife cruise and charter boats: Impact significance)

Potential impacts include loss of scenic view quality resulting in a reduction in recreational users and loss of amenity for those who participate in wildlife cruise and charter boat activity. The proposed development site is too far from shore to be frequently used for this purpose so is unlikely to cause disruption.

Assessment of impact significance

The sensitivity of the receptor is considered low, magnitude of impact is considered negligible with an overall consequence of negligible and a significance of not significant.

Sensitivity of receptor	Magnitude of impact	Consequence
Low	Minor	Minor
Impact significance – NOT SIGNIFICANT		

MITIGATION RELATING TO IMPACT 19.12

It has been concluded from the assessment that there will be no significant impacts on the basis that the following measures were incorporated into the design of the Project in order to remove or reduce any likely significant effects:

- The proposed pilot park is 25km east of Peterhead and consists of five turbines. The distance from shore and relatively small number of turbines act to reduce the visual impact from shore based (or near shore) tourism and recreation activities

Based on specific measures included in Project design no further mitigation measures are required.

3.3.7 Impact 19.13 Increased tourism/ business interest during operation and maintenance

The potential for increased tourism and business interest directly related to the proposed development site is based on the growth of boat tours to the Hywind demonstrator based 10 km off the south-west coast of Norway.

(Hywind pilot park tourism: Impact significance)

There may be a positive local impact for operators of wildlife cruise and boating trips to extend tour services to the Hywind pilot park. The pilot park is, however, 2.5 times the distance from shore compared to the Hywind demonstrator (a comparative round trip of 50 km compared to 20 km). A combination of typically inclement sea conditions and fuel costs may act to minimise the potential impact of this during the operation and maintenance phase.

Assessment of impact significance

The sensitivity of the receptor is considered low, magnitude of impact is considered positive with an overall consequence of minor and a significance of not significant.

Sensitivity of receptor	Magnitude of impact	Consequence
Low	Positive	Minor
Impact significance – NOT SIGNIFICANT		

MITIGATION RELATING TO IMPACT 19.13
No mitigation measures have been identified for this impact as it was concluded that the impact was not significant

3.4 Decommissioning impacts

3.4.1 Impact 19.14 Potential impact on direct employment and GVA

Costs related to decommissioning of the turbines after operating 20 years are estimated by Statoil to be £3m based on industry estimates of £100k per MW removal of fixed offshore wind farms. Due to Hywind's tethering and mooring system, removal of the installations will be much quicker and decommissioning costs much less than for fixed wind turbines. The actual decommissioning cost will also depending upon the level of reuse or recycling of the turbines, towers, substructures and equipment. Statoil's estimated decommissioning costs are higher at **£10m**, which is probably a more accurate figure based on their experience.

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during construction and installation is assessed as follows.

(Direct impact employment and GVA during decommissioning: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered to be not applicable for economic factors. Direct impacts offshore during removal are estimated to be around 25% of decommissioning costs eg **£2.5m** primarily for marine transport services, with limited jobs creation potential for a short period over one to two months. In terms of impact significance, the magnitude and scale of the project, which is localised and short term and therefore is considered to have a minor economic impact and consequence.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

3.4.2 Impact 19.15 Potential supply chain impacts

Depending on weather the five floating installations are refurbished, reused or scrapped and recycled, there is some uncertainty of the potential impacts on the local and Scottish economies.

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during decommissioning is assessed as follows.

(In-direct impact employment and GVA during decommissioning: Impact significance)

Assessment of impact significance		
The sensitivity of the receptor is considered to be not applicable for economic factors. Greater economic impact potential will result in the supply of recycling services and onshore port facilities, estimated to generate £1.5m GVA in the local economy, based on a 1:2.5 Turnover to GVA ratio and a 50% leakage rate. This could have the potential to create around 21 temporary jobs in the Aberdeenshire region and is therefore deemed to be of minor magnitude and consequence, although of some impact significance.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Minor	Minor
Impact significance – SIGNIFICANT		

Decommissioning work and recycling of parts and materials is likely to be accommodated with the existing Scottish supply chain.

3.4.3 Impact 19.16 Potential for inward investment

Limited potential to attract inward investment due to the scale and short term nature of the decommissioning opportunity potential of the Project.

Impact significance

The sensitivity, impact magnitude, consequence and impact significance of each receptor during decommissioning is assessed as follows.

(Potential for inward investment: Impact significance)

Assessment of impact significance The sensitivity of the receptor is considered to be not applicable for economic factors. Considerable capability exists within the oil & gas decommissioning supply chain that could potentially diversify into offshore wind. The Project of this size has limited potential to attract inward investment and is therefore judge to be of negligible magnitude and consequence, although of some impact significance.		
Sensitivity of receptor	**Magnitude of impact**	**Consequence**
N/A	Negligible	Negligible
Impact significance – SIGNIFICANT		

3.4.4 Potential impacts on existing tourism and recreational activities

The impact assessment of tourism and recreational activities will be carried out when information becomes available on the agreed viewpoints and zone of theoretical visibility.

3.4.5 Potential for increased tourism/ business interest

The impact assessment of tourism and recreational activities will be carried out when information becomes available on the agreed viewpoints and zone of theoretical visibility.

3.5 Cumulative impacts

Cumulative direct and indirect combined impacts from construction & installation, O&M and decommissioning activities, excluding turbines and heavy lift vessels (scenario 1) are summarised below.

Activity	Capital Spend	Direct and Indirect GVA £m (TO/GVA Ratio 2.5:1)	Net Direct, Indirect and Induced Jobs Supported
Construction and installation	£100m	£40m	257 FTEs per year in first two years
Operation & Maintenance	£100m	£40m	33 FTEs for 20 years
Decommissioning	£10m	£4m	21 temporary jobs over 12 months
Total	**£210m**	**£84m**	**257 FTE short term jobs , plus 33 FTE jobs over 20 years followed by 21 temporary jobs over six months**

Table 22 – Cumulative economic impacts (scenario 1)

For Scenario 2 or worst case scenario with only operational maintenance and decommissioning being carried out in Scotland, the cumulative combined direct, indirect and induced impacts

are £110 million capital spend over twenty years, generating around £44 million of GVA and supporting some 33 long term direct, indirect and induced jobs and 21 temporary jobs.

3.6 Potential socio-economic impacts beyond the pilot project

The Project is potentially a springboard to the wider opportunity for Scotland of developing expertise in floating offshore wind. Experience gained in the design, construction, installation, operation and decommissioning could provide significant expertise and supply chain capability in Scotland. This could lead to the development of the potential larger park offshore from Scotland and the opportunity for the Scottish supply chain expertise to take advantage of floating wind farm developments elsewhere. Other offshore projects[26], which together with the Project could result in the potential cumulative or in-combination impacts are shown below.

Project name	Distance from Pilot Pk	Project developer	High level description
European Offshore Wind Deployment Centre (EOWFL)	37 km	Aberdeen Offshore Wind Farm Ltd	Offshore wind turbine deployment centre for 11 turbines with up to 100 MW capacity.
Kincardine Offshore Wind Farm	47 km	Kincardine Offshore Wind Farm Limited	Offshore wind commercial demonstrator site, utilising floating semi-submersible technology to install approximately eight wind turbine generators.
Firth of Forth Offshore Wind Farm	83 km	Seagreen Wind Energy Limited	Offshore wind farm and export cabling to be developed in three Phases with a total target capacity of 3.5 GW.
Moray Offshore Renewables Wind Farm (eastern dev area)	99 km	Moray Offshore Renewables Ltd (MORL)	A 1,500 MW wind farm over an area of 125 km^2 in the outer Moray Firth. Includes an export cable approximately 105 km in length offshore to Fraserburgh and 30 km onshore to substation.
Inch Cape Offshore Wind Farm	103 km	Inch Cape Offshore Wind Farm Ltd	Offshore wind farm up to 213 turbines, covering an area of up to 150 km^2 with capacity of approximately 1,000 MW.
Beatrice Offshore Wind Farm Demo Project	118 km	SSE and Talisman	A two-turbine (10 MW) demonstrator project.
Beatrice Offshore Windfarm Ltd (BOWL)	118 km	SSE	An offshore wind farm with a maximum of 227 offshore turbines, generating up to 1,000 MW in the outer Moray Firth.
Neart na Gaoithe Offshore Wind Farm	131 km	Mainstream Renewable Power	Offshore wind farm, 75- 125 turbines, 450 MW with 33 km export cable to shore.
Fife Energy Pk Offshore Demo Wind Turbine	170 km	Fife Energy Park	Consent granted to test a single offshore wind turbine.
NorthConnect	0 – 30 km (depending on cable route)	NorthConnect	Onshore component of NorthConnect Project for HVDC cable between Norway and UK. Erection of converter station, underground cabling and association infrastructure and improvement works.
Eastern HVDC Link	0 – 30 km (depending on cable route)	SSE and National Grid Electricity Transmission	Upgrade of existing infrastructure in Peterhead (upgrade of existing HDVC converter station at existing power station) and installation of a subsea HDVC cable from Peterhead to Teesside.
Aberdeen Harbour Development, Nigg Bay	45 km	Aberdeen Harbour Boards	The proposed (AHD) would occupy a large proportion of Nigg Bay, comprising approximately 1400 m of new quays (13-14 new berths).
Offshore Renewables Masterplan, Ardersier	132 km	The Port of Ardersier Limited	Establishment of a port and port services for energy related uses.

[26] Hywind Scotland Pilot Park Project, ES Structure, Contents and Instructions to Authors, Xodus Group

Invergordon Service Base 3 Development	145 km	Cromarty Firth Port Authority	Extension of the three piers to provide new berths, and laydown areas.

Table 23 – Cumulative economic impacts (scenario 1)

The Project will also have a long term socio-economic impact on the local community through increased tourism activities over the 20 year timescale.

4. Summary and Conclusions

Based on the results of the socio-economic assessment of the Hywind Scotland Pilot Park project carried out by Optimat Ltd, the following conclusions are summarised as follows:

4.1 **Under Scenario 1** - all construction, installation, operations & maintenance, decommissioning takes place in Scotland, except for turbine manufacture and heavy lift vessel charter costs, the cumulative economic impacts are projected to be:

- A total potential capital investment of £210 million, equating to around £84 million direct and indirect GVA
- £100 million capital spend on construction and installation resulting in a potential £40 million direct, indirect and induced GVA in the Scottish economy within a two year project timeframe
- £100 million long-term operational spend, generating a potential £40 million GVA and supporting 33 FTE net direct, indirect and induced jobs over the 20-year Project timeframe
- Supporting nearly 260 FTE net direct, indirect and induced short-term jobs in Aberdeenshire and the rest of Scotland during the first two years of construction and installation of five offshore turbines off Peterhead
- £10 million capital spend on decommissioning of five turbines after completion of the 20 year Project, supporting around 21 temporary short-term jobs within a 6 month time window.

4.2 **Under Scenario 2** – where only operations & maintenance and decommissioning takes place Aberdeenshire and the rest of Scotland, the cumulative economic impacts are projected to be:

- £110 million operational spend over 20 years of the Project lifetime, generating an estimated £44 million of GVA and supporting 33 long-term direct, indirect and induced jobs.
- £10 million decommissioning expenditure for the removal, re-use and/or recycling of five offshore installations, generating £4 million GVA after 20 years of operational life.
- £4 million of direct and indirect GVA creating around 21 temporary jobs over a six month operational window.

4.3 The impact assessment indicates there could be around £8 million direct spend in and around the Peterhead area during the onshore construction phase, with potentially a high level of local content.

4.4 The economic impact significance of the Project ranges from minor to moderate, where the magnitude and consequence of nearly 260 FTE jobs supported and £40 million GVA during construction and installation in the first two years is judged to be moderate. The £5 million spend per annum and 33 FTE jobs during O&M, along with £10 million spend and 21 temporary jobs during decommissioning are considered to be of minor magnitude and consequence.

4.5 The Project has the potential to attract inward investment especially for turbine manufacture, tower/substructure fabrication and O&M operation which would have significant economic impact, although the five turbine pilot Project alone is unlikely to attract investors to setup facilities in Scotland.

4.6 The Project is potentially a springboard to the wider opportunity for Scotland of developing expertise in floating offshore wind, where experience gained eg design, construction, installation, operation and decommissioning could lead to cumulative projects. For example, a potential larger offshore park off Scotland or in-combination with 12 other current/future offshore projects off Scotland.

4.7 Potential impacts on existing tourism and recreational activities or potential for increased tourism / business interest will be undertaken when information becomes available on agreed viewpoints and zone of theoretical visibility.

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26. Hywind Scotland Pilot Park Project, ES Structure, Contents and Instructions to A

Appendix A. Online Supply Chain Survey

Please answer the following questions covering basic company details, your interest in being considered for supply chain opportunities connected to the Hywind Pilot Project, your organisations track record and capabilities and your views on potential impacts of the project on your turnover and employment levels.

Basic organisation details

Organisation Name

Contact Name

Role/position

Email

Tel

Postal Address

Brief description of the main activities of your company

Number of employees (Full Time Equivalents)

Turnover in last financial year (£)

Your interest in the Hywind Pilot Project

Are you interested in being considered for the supply of goods and services to the Hywind Pilot Project?

1. Yes
2. No
3. Possibly

Your organisational track record and capabilities

Please indicate which of the following markets you currently supply goods/services to:

1. Oil and gas
2. Onshore wind
3. Offshore wind
4. Other

Please now highlight the areas where your organisation has a track record of supplying goods and services within the last three years

Development & Planning

1. Windfarm design services

2. Environmental impact assessments
3. Met Stations
4. Geophysical/Geotechnical surveys

Wind Turbines

1. Manufacture of other fabricated metal products
2. Nacelle
3. Blades
4. Bedplate
5. Gearbox and drivetrain
6. Generator/rotor system
7. Tower manufacture

Balance of Plant

1. Fabricated metal structures/part structures
2. Substructure/foundation fabrication
3. Mooring system fabrication
4. Onshore/offshore substations
5. Export cable manufacture
6. Electronic components and control systems

Installation

1. Turbine installation
2. Foundation installation
3. Tow out and lifting vessels
4. Subsea cable laying/installation
5. Offshore substation installation
6. Inshore construction/assembly ports

Operation & Maintenance

1. Maintenance and repair services
2. Replacement equipment
3. Onshore repair/spares ports
4. Accommodation
5. Personnel transfer vessels
6. Installation / repair vessels

Decommission

1. Design and engineering services
2. Marine lifting / crane vessels
3. Support vessels
4. Port facilities
5. Diving/ROV services
6. Environmental impact assessments

Your views on the potential impacts of supplying the Hywind Pilot Project on your organisation

What potential overall impact would supplying to the Hywind Pilot Project have on new jobs

within your organisation?

1. No change
2. 1 to 10 new jobs
3. 11 to 25 new jobs
4. 26 to 50 new jobs
5. 51 to 100 new jobs
6. > 100 new jobs

What potential overall impact would supplying to the Hywind Pilot Project have on safeguarding existing jobs within your organisation?

1. No change
2. 1 to 10 jobs safeguarded
3. 11 to 25 jobs safeguarded
4. 26 to 50 jobs safeguarded
5. 51 to 100 jobs safeguarded
6. > 100 jobs safeguarded

What potential overall impact would supplying to the Hywind Pilot Project have on the turnover of your organisation?

1. No change
2. < 5% increase in turnover
3. 5% to 10% increase in turnover
4. 11% to 15% increase in turnover
5. > 15% increase in turnover

Finally, would you like to be informed about procurement processes for the Hywind Pilot Project, when available?

1. Yes
2. No

Thank you for taking the time to complete this survey.