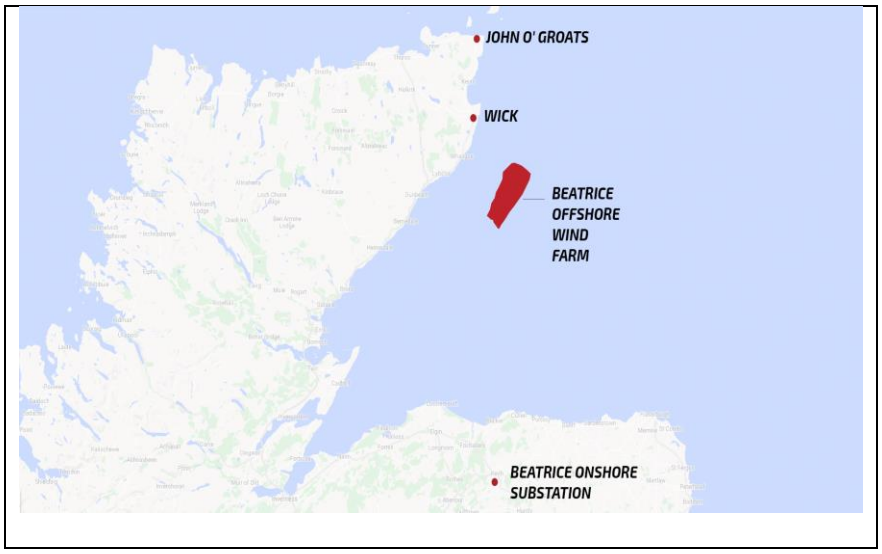
Technical Report 5: Beatrice comparative study – final research report



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Executive Summary

The Beatrice comparative study is one of two studies which were researched to provide comparators and contrasts for the small main EOWDC (Aberdeen OWF) case study. The other comparative study is for the large Hornsea OWF array. The Beatrice project is a medium size project of almost 600MW, sitting in size between the Aberdeen and Hornsea developments. It is located off the near top of the NE Coast of Scotland. This research study draws on a detailed review of publicly available application, consent and review documentation. It is not intended that this case study will have the same level of primary analysis as the main EOWDC case study.

Some impact conclusions: The project has good recognition of the importance of socio-economic impacts, but with an economic focus and little coverage of the social dimension, both in the initial ES assessments and in project implementation. Social issues only emerge significantly in the evolution of the Community Benefit Fund. There is a strong economic focus on Gross Value Added (GVA) and employment, but use of high and low case scenarios results in a very wide ranges of impacts and great uncertainty in predicted impacts, especially for the construction stage of the project; this is somewhat less marked for the O&M stage. There is good spatial disaggregation of predicted impacts in the ESs (into local Study Area, Scotland, UK), but this is not followed through into monitoring with no specification of local (Study Area) impacts – to compare with predictions.

Comparison of estimated actual outcomes with the ES predictions, from recent review reports commissioned by the Beatrice project, is complicated by the subsequent 40% reduction in the size of the windfarm post-ES. The review outcomes have been closer to the high predicted impacts rather than low, although the recent 2019 estimated outcomes may be on the high side. The local Study Area gains most over the project life from the O& M stage; the 'actual' figure reported for O&M activities in Wick alone appears to support this prediction. The 2019 review study does not report on the local area economic impacts, focusing only on Scotland and the UK. Policy initiatives to enhance positive impacts appear to be favourable to Scotland, although there are some critical views of the extent of local benefits.

Some project good practice lessons: The Beatrice Study benefits from some high level monitoring, via recent I-O studies which use actual contract data, although the details of the data are not available for analysis, and such studies involve a whole set of assumptions. There is an innovative Social Return on Investment (SROI) approach applied to actual Community Benefits Fund data. An important argument noted is that this OWF project is also making important socio-economic contributions, along with other projects in Scotland, in improving/sustaining the supply chain (in the face of oil and gas industry decline), and enhancing key infrastructure. In particular, the development and modernization of a cluster of port sites which could support an offshore wind sector, at Nigg, Invergordon, Wick and Buckie, is a very important outcome from this project, which may be of considerable significance for future projects. The use of policy initiatives to enhance positive impacts, with an apparent shift well away from the low case, appear to be favourable to Scotland, as reflected in the 2019 estimates. There is also an innovative approach to the distribution of Community Benefits Funds, although some queries about the nature of the process used to arrive at the size and nature of the Fund.

1. Research approach

The Beatrice comparative study is one of two studies which were researched to provide comparators and contrasts for the small main 96MW EOWDC (Aberdeen OWF) case study. The other comparative study is for the Hornsea OWF array, which includes Hornsea 1-4, and which provide an example of a major OWF programme on a large scale, with a potential capacity of 7GW. The Beatrice project is a medium size project of almost 600MW, sitting in size between the Aberdeen and Hornsea developments. It is located off the near top of the NE Coast of Scotland.

The Beatrice case study data draws on a detailed review of relevant application and consent documentation and secondary data that are publicly available or easily accessible. It is not intended that this case study will have the same level of depth of analysis as the main EOWDC case study. Where possible it includes information from the key developers (in particular SSE) and local authorities, especially in relation to project specific quantitative data on employment and contract expenditure during the construction and employment stages of the project. The case study also draws on data from other relevant stakeholders, including Scottish local authorities and agencies.

The structure of the report is as follows:

1. *Research approach*
2. *Project characteristics – context and background*
3. *Pre-application consultation*
4. *Socio-economic content in application documentation (esp. in ES) - overview*
5. *Socio-economic issues in project examination: economic*
6. *Socio-economic issues in project examination: social*
7. *Socio-economic issues in project examination: others*
8. *Mitigation and enhancement*
9. *Actual impacts during project construction*
10. *Actual impacts during project O&M*
11. *Some conclusions and project good practice lessons*

2. Project characteristics – context and background

The BOWL project is located in the North Sea, approximately 25km south east of Wick and, at its nearest point, about 13.5 km off the Caithness coast in the NE of Scotland. The £2.6bn project is a 40:25:35 joint venture between SSE Renewables Ltd (SSE), Repsol SA (Repsol), and Copenhagen Infrastructure Partners (CIP). The Scottish Government has granted offshore planning consent for over 4GW of new projects, including BOWL. It is the largest single private investment in Scotland.

BOWL is a 588MW wind farm, covering approximately 132 km², and comprising 84 offshore Siemens 7.0MW wind turbines. It is connected to the grid via a 65km cable route south to the onshore landfall at Portgordon on the Moray coast, and then via a 20km underground route to a new substation adjacent to the existing substation at Blackhillock, south of Keith. Much of the construction stage has been serviced from NIgg; the operational and maintenance (O&M) stage will be serviced from a new purpose built facility at Wick in Caithness (see Figs 1,2, and 3).

The project has been the subject of two application, assessment and consent procedures. The offshore generation and transmission elements were consented under Section 36/37 of the Electricity Act 1989 (as amended), and by Marine Scotland for marine licence consent, in 2014. The onshore cable and substation elements were consented under the Town and Country Planning (Scotland) Act 1997 by Moray Council, in principle in 2012 and in detail in 2015.

Projects such as Beatrice are seen as important elements in the Scottish Government's Low Carbon Economic Strategy (LCES, 2010) which forms an integral part of the Government Economic Strategy (GES), setting the overarching agenda to support the transition to a low carbon economy. The LCES identifies the need to exploit commercial opportunities and suggested in 2010 that offshore wind development alone could generate 28,000 direct jobs, a further 20,000 jobs in related industries and over £7 bn investment in Scotland by 2020. The National Renewables Infrastructure Plan (2011) outlines support for the development of a globally competitive offshore renewables industry based in Scotland, with an emphasis on creating clusters of economic activity throughout the supply chains around key locations in Scotland for manufacturing, installation, operation and management. This is expected to create a set of clustered port sites which could support an offshore wind sector.

3. Pre-application consultation

Pre-application consultation (PAC) reports were produced by the developers for both the offshore and onshore works. EIA scoping was carried out for the project with the purpose of outlining the project to key stakeholders so that their comments could be incorporated into the EIA process. The scoping report (SSE/ERM, March 2010) noted, inter alia, that:

> The socio-economic impacts of the construction (currently estimated to be in the region of £3bn) and operation of an offshore wind farm of the size of the Beatrice proposal are likely to be significant, and will impact at a national and local level. Impacts will vary considerably at each level depending on the technology deployed, type of structures, contracting strategy and other factors such as the availability and capacity of the supply chain. A range of scenarios will be considered in the assessment.
>
> At a more local level the project could provide significant levels of employment during the construction phase and long term opportunities through the operational life of the project. There is an opportunity for many Scottish firms to be involved throughout the life of the project, ranging from development studies through construction, installation, operation and maintenance phases.

In support of the project, there were a number of public exhibitions that were designed to provide an opportunity for the public to ask questions, understand the proposals and provide feedback.

There were also a number of supply chain opportunities events. There is also a regularly updated project website.

For the offshore element of the project, key consultees included the Highland Council, Highlands and Islands Enterprise, Visit Scotland and the Caithness and North Sutherland Regeneration Partnership. There was also consultation with an array of bodies in relation to shipping, fishing and the oil and gas industry. In relation to socio-economic impacts, the Highland Council stressed the importance of: (i) maximizing the amount of GVA in terms of employment and associated economic activities that comes to the Highlands in the construction phase; (ii) the use of the port of Wick as a potential operation and maintenance facility, and (iii) that the applicant should work with public and private sector bodies in the Highlands to ensure that the area receives maximum socio-economic returns from the development (North Planning Applications Committee, Highland Council, June 2013).

For the onshore element of the project, Moray Council's Policy ER1: *Renewable Energy Proposals* is particularly relevant as, whilst the onshore development is not a wind farm development per se, it is essential infrastructure for the wind farm and is integral to the realisation of the renewable energy benefits of the wind farm. The policy states that "renewable energy proposals will be considered favourably where they are compatible with tourism/recreational interest and facilities." In its 2015 unanimous support for the project Moray Council highlighted the choice by SSE of Buckie Harbour as a contingency base for the O&M work and for the marine control coordination base. Confirmation of the harbour role is seen as bringing major benefits to the area in the lease of berths and the development of buildings for the use of vehicles, equipment and personnel. It is hoped that there will also be opportunities for local contractors and services with the increased business expected through the harbour.

***Figure 1**: Location of key elements of the Beatrice project*

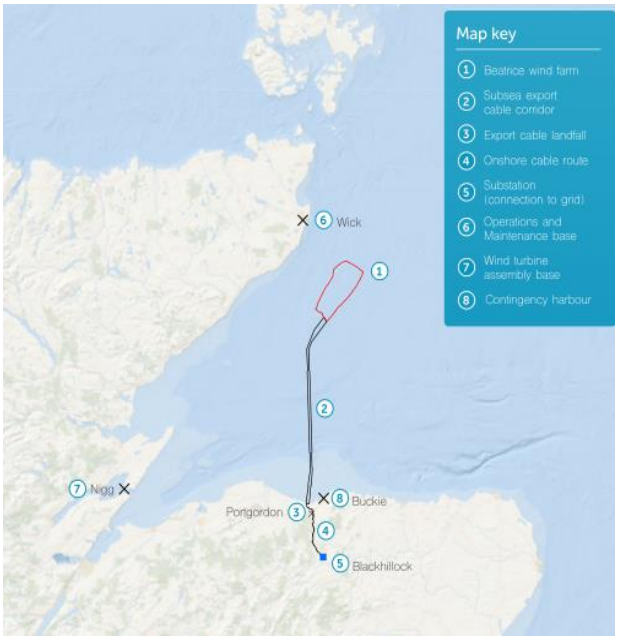

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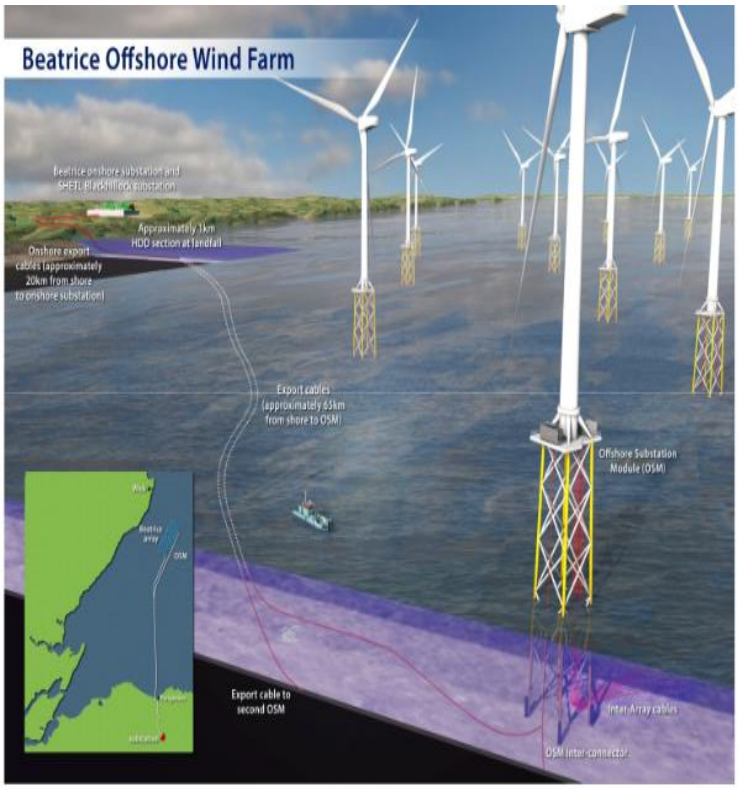
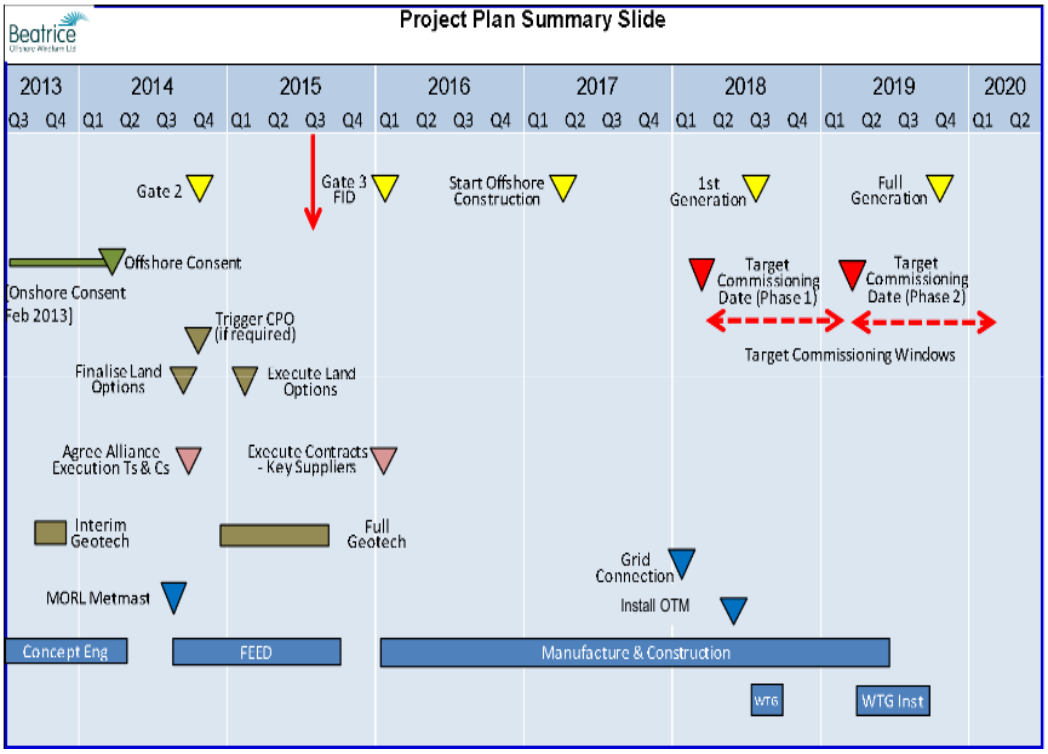
***Figure 2**: Further details of the project*



Key Facts	
STW Leasing Round Award	February 2009 – STW
Joint Venture Structure	SSE – 50%, Repsol – 25% CIP - 25%
Site Area	~ 131.5 km2
Distance from Shore	13.5 km from Caithness at closest point
Water Depth	35m - 65m
Grid Connection	Blackhillock (Near Keith) - 2018
Offshore Planning Application submitted	April 2012 up to 277 turbines depending on size
Onshore Planning Application submitted	October 2012 – Application for Planning Permission in Principle
Delivery Model	3 EPCI Contracts

Source: BOWL (website)

***Figure 3**: Development and construction programme*



Source: BOWL (website)

The first power was exported in July 2018, and the project will become fully operational in 2020.

4. Socio-economic content in application documentation (esp. in ES) - overview

As noted above, the socio-economic impacts of the offshore elements of Beatrice were scoped as likely to be significant and this is partly reflected in the coverage of socio-economic issues in the ESs for the offshore and onshore elements of the project (Arcus/SQW 2012/2015). There are two socio-economic, tourism and recreation chapters for the offshore element ES (wind farm and transmission works). The sections include: assessment methodology and significance criteria; baseline description; assessment of potential effects; mitigation measures and residual effects; summary of effects, and statement of significance. The focus of the assessment is on: potential employment effects, economic value as measured by GVA, and potential effects on tourism and recreation activity. There is initial reference also to effects on other social indicators, but these are very thinly covered. They are seen as deriving from the economic and environmental conditions, and difficult to assess directly.

For the wind farm, the assessment covers three stages of the project life: construction, O&M and decommissioning -- although often elided into two: development/construction and O&M/decommissioning. For the offshore transmission work, the focus is on the construction stage only. For the onshore element, socio-economic effects were surprisingly scoped out in the original ERM Scoping Report (SSE 2011). However, socio-economic, tourism and recreation were later considered in two versions of the ES (Arcus Renewable Energy Consulting, 2012 and 2015).

The Study Area for the offshore works is defined as covering the local authority areas that border the Moray Firth in which the project is located: Moray, Highlands and Aberdeenshire. Aberdeen City is also included because of its number of energy related businesses and proximity to the project. The potential employment and GVA that the project supports is also considered for Scotland and the UK. The Study Area for the onshore works is limited to the Moray Council local authority area.

Estimates of socio-economic impacts, in particular of the offshore elements, are complicated by the changes made in the size of the project. The socio-economic assessment is based on the full development of the proposed 1000MW wind farm, with its associated expenditure and implications for employment and GVA, but this has now been reduced to a project of 580MW**.** As the assessment notes:

If the full proposal is not developed, for example if there are fewer turbines and less generation capacity installed than currently planned, then the associated expenditure and employment would be reduced. This would be broadly proportionate to the reduced scale of the project, but economies of scale would mean that the reductions in expenditure would be slightly less than the reduction in the scale of the development.

Cumulative effects are briefly covered in relation to other projects (eg. other N. Sea wind farms, oil and gas projects and port and harbour developments), but more fully in terms of the cumulation of the various elements of the project itself—especially the wind farm and offshore transmission.

5. Socio-economic issues in project examination: economic (with focus on methods and predictions)

As noted above, the economic focus of the offshore elements is on GVA, employment and tourism and recreation impacts, and these impact types are used to structure this section, which summarises the methods employed and the predictions made. The economic focus of the onshore elements is limited to employment – direct and indirect.

GVA

Estimates of employment and GVA impacts are based on estimates of project expenditure provided by the developer for the various stages of the project, under two scenarios. A Low Case Scenario estimates the value of contracts delivered for each geographical area, assuming the

current supply chain. A High Case Scenario estimates the same, but assuming a stronger supply chain for Scotland and the Study Area. Direct GVA estimates are derived from the application of a ratio of turnover to the relevant expenditure values, using industry specific ratios calculated using the Scottish Government 2007 Input–Output Tables (Scottish Government, 2010). In addition, it is important to consider the Indirect and Induced GVA impacts that the development will produce. Indirect impacts are the knock-on increase in demand by wind farm suppliers on their own suppliers and so on down the supply chain. Induced impacts are the increases in expenditure on goods and services from the increased expenditure by those households benefitting from employment directly or indirectly from the project. A combination of Scottish and UK Input Output Tables is used to produce multipliers for each of the three geographical areas.

Table 1 is the summary of the total direct and indirect and induced GVA effects of the main Wind Farm element of the project for the Study Area, Scotland (including the Study Area) and the rest of the UK, over the lifetime of the project, for the two scenarios. It shows considerable variations in predicted impacts between the two scenarios, and between the two project stages. For the Study Area, the share of the total short period development/construction GVA varies from about 2-10 % and from 30-40% over the 25+ year O&M/decommissioning stage. For Scotland (including the Study Area), the equivalent percentages are 30-50 and 60-75. Table 2 shows that the GVA impacts of the Offshore Transmission element of the project are small in comparison.

Table 1: *GVA effects (£ millions) of the Wind Farm element over the lifetime of the project, for the two scenarios*

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

Note: the indirect multiplier employment includes both indirect and induced multiplier effects
Note: GVA is the total relating to the expenditure of the full budget over the life of the Project
Note: numbers may not add owing to rounding

Source: Arcus/SQW (2012/2015).

Table 2: *GVA effects (£ millions) of the Offshore Transmission element over the lifetime of the project, for the two scenarios*

	Study Area			Scotland		
	Direct	Indirect	Total	Direct	Indirect	Total
Low case	1	0	1	4	3	7
High case	1	1	2	10	7	17

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

Source: Arcus/SQW (2012/2015).

Employment

The employment impacts for the development/construction stage are calculated by applying the 'employment effect' multiplier values that best fit the various project goods and services, from

Scottish Input-Output tables, to the expenditure expected in each year and in each geographical area. The direct, indirect and induced employment are calculated from the Scottish Input-Output tables and adjusted for the Study Area and UK estimates, as for the GVA estimates. The ES argues though that this approach is less appropriate for the O&M stage, where much of the expenditure is on the hire or purchase of capital goods (such as helicopters and boats) rather than employment. In this case the ES makes use of the findings in a report produced by Oxford Economics for Vestas Offshore (Oxford Economics, 2010) which provides estimates of direct and indirect O&M employment per MW. This is applied to the BOWL project in Table 3.

***Table 3**: Calculations for annual O&M employment*

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

Source: Oxford Economics/Vestas (2010)

Table 4 shows the ES predictions for the employment impacts of the wind farm for the Low and High Case Scenarios in total job years. The bulk of the job years are very much concentrated in the 3-4 years of project construction. Study area construction stage job years range from about 2-8% of the total under the two scenarios; the figures for Scotland (including the Study Area) range from about 35-50%. For the O&M stage, the equivalent ranges are higher at about 33-40% for the Study Area and 62-70% for Scotland.

Table 5 shows the construction stage employment figures for the peak employment year, illustrating what is likely to be the largest impact at any one point in time. For the Study Area, the predicted number of jobs (direct and indirect and induced) varies substantially across the two scenarios from 220-740; the figures for Scotland (including the Study Area) are 1,710 to 3,100. For the O&M stage, the employment figures are lower, ranging from 110-210 for the Study Area, and from 190-340 for Scotland; but these represent reasonably steady and reliable levels of employment for a period of at least 25 years. For all the estimates the indirect and induced impacts are sizeable and of the order of 60-70% of the direct impacts. Table 6 shows the small number of jobs associated with offshore transmission construction in comparison with those for the wind farm (Table 4). Overall the local/ study area job years (Direct/Indirect and Induced) per MW appear to range from about 0.5-2 for the Low and High Scenarios for the development/construction stage and from about 3-6 for the Low and High Scenarios for the O&M stage (based on the full 1000 MW development). This emphasises the relative importance of the O&M stage of the project life cycle for local employment.

For the onshore works, it is estimated that during the anticipated 21 month construction period, the Project could generate up to 145 temporary jobs (it is not clear whether these are job years). Construction workers not living locally will make use of local accommodation (eg. hotels and B&Bs) during the construction period, which will result in a temporary, indirect benefit to the local economy (i.e. providing an economic opportunity for local accommodation and other local services such as shops and restaurants). In the context of the Moray local economy, this level of temporary additional employment is assessed as of moderate positive significance. Operational employment is seen as minimal at one person; decommissioning employment could be of the order of 55.

***Table 4**: Employment effects in job years – wind farm*

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

Note: the indirect multiplier employment includes both indirect and induced multiplier effects
Note: numbers may not add owing to rounding

Source: Arcus/SQW (2012/2015).

***Table 5**: Employment effects summary in terms of peak (construction) and annual (O&M) jobs for the wind farm*

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

Note: the indirect multiplier employment includes both indirect and induced multiplier effects
Note: Construction figures are for the peak year of employment (2017), operations figures are the steady employment over the 25 year life of the Wind Farm
Note: numbers may not add owing to rounding

Source: Arcus/SQW (2012/2015).

***Table 6**: Total employment impacts in job years – offshore transmission*

	Study Area			Scotland		
	Direct	Indirect	Total	Direct	Indirect	Total
Low case	5	3	8	32	28	60
High case	11	6	17	81	70	150

Note: the indirect multiplier employment includes both indirect and induced multiplier effects
Note: job years represent the equivalent of employment for one year and do not represent the number of people employed by the Project

Source: Arcus/SQW (2012/2015).

Tourism and recreation

The assessment of impacts of the project on tourism and recreation are less quantitative than those for GVA and employment. The assessment includes a profiling of visitors to the region, a review of research on the impacts of wind farms on tourism and recreation, and the identification of any direct impacts (eg impacts on public rights of way) and indirect impacts (eg especially on amenity through the modification of seascapes and the visual effects of the project.

Tourism is important for the Study Area with, for example 11% of Highlands' employment in the tourism industry, compared with 7% for Scotland as a whole. There are many important tourism assets, including attractive landscapes and seascapes, wildlife, small towns and many historic

features. The local population of bottlenose dolphins is a particularly important coastal attraction for tourists. Evidence from various studies of the impacts of wind farms on tourism is used to provide comparative information for the Beatrice study. The various studies, including in particular a Glasgow Caledonian University (2008) study for the Scottish Government, showed that although tourists would in general prefer their landscapes without wind farms, their concern was not such as to deter them from visiting/revisiting landscapes with wind farms. It should be noted that much of the current research relates to the impacts of onshore wind farms. Research studies on the visual impacts on tourism of offshore wind farms (eg on N. Hoyle, RBA Research/RWE 2004; a US report on N. Carolina—Wind Turbines and coastal Recreation Demand 2011) again found very little effect on tourism and coastal recreation. There may be more aversion to OWFs close in shore, compared to those more distant, but again there are examples where those close to the coast have become popular landmarks and attractions (eg Scroby Sands off the Norfolk coast).

The assessment of the Beatrice project on tourism concludes that there will be no direct effects. In terms of indirect visual impacts, the wind farm will be visible with a moderate/major magnitude to visitors at a number of tourism locations, but the comparative evidence suggests that such visual impacts will not negatively impact on tourism. One area however which may be affected, at least in the short run during project construction, is that of the dolphin and seal populations. The noise level from piling for construction does have the potential to change the behaviour of marine animals, which could in turn reduce the attractiveness to tourists. There may also be some positive business tourism impacts associated with the project; research on Dounreay estimated 8-16 business bed nights generated for each direct job.

Overall summary of significance of predicted economic impacts

Tables 7 and 8 provide summaries of the estimates of significance of economic impacts as set against the socio-economic baseline of the Study Area, for the wind farm and for the offshore transmission works. The ES concluded that, as there were not negative impacts above minor, mitigation measures for socio-economic impacts were not required.

It should also be noted that because of the reduction in scale of the OWF to be actually constructed by 40%, there is a logical case for reducing the various predictions contained in the ES by 40% (although there may have been some economies of scale with the larger project, but this is difficult to estimate). Thus, for example, peak construction Study Area employment from the wind farm would be of the range 130 – 450, and the annual average for the Study Area during the O&M stage would be in the range 70-130.

***Table 7**: Summary of significance of socio-economic, tourism and recreation impacts –wind farm*

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

Source: Arcus/SQW (2012/2015).

***Table 8**: Summary of significance of socio-economic, tourism and recreation impacts – offshore transmission*

	Sensitivity	Magnitude	Assessed Significance	EIA Significant Y/N
GVA	*High*	*Low*	*Moderate (+)*	*Y*
Employment	*High*	*Low*	*Moderate (+)*	*Y*
Surfing & sea kayaking	*Low*	*Negligible*	*Negligible*	*N*
Marine wildlife tourism	*Low*	*Negligible*	*Negligible*	*N*

Source: Arcus/SQW (2012/2015).

6. Socio-economic issues in project examination: social

In terms of the socio-economic baseline, the Study Area, especially Aberdeenshire and Aberdeen City, has benefitted from the oil and gas industry developments over recent decades, and this is reflected in levels of employment, education, skills and relative deprivation – although a major downturn is now affecting several economic indicators. Highland and Moray have scored less well on various socio-economic indicators, although both have shown significant improvements on deprivation indicators over the last few years.

In terms of the potential social impacts of the development in the context of the baseline, as noted in Section 4 of this document, while there is initial reference to effects on other social indicators, these are very thinly covered. Social impacts are seen as deriving from the economic and environmental conditions, and are seen as difficult to assess directly. It can be argued that the discussion of tourism and recreation impacts in the previous section, raising the issues of perception of visual impacts, can be seen as overlapping into social impacts.

Given the low numbers of likely local employees, and the short period of the more sizeable construction employment impact period, it is partly understandable as to why impacts on local

services have received little consideration, but it is surprising that issues such as community image, stability and cohesion associated with this high profile renewable energy project receive little or no mention at all. In terms of specific social impacts on specific communities, much does depend on the chosen location of ports to service the development. Since the conclusion of the ES and the application/assessment process, Wick and Buckie have been chosen as service bases and it is likely that associated port development to accommodate the project will have some positive regeneration impacts for these two small port communities. It is estimated that the Wick Harbour investment for the O&M stage of the project will be of the order of £10m.

7. Socio-economic issues in project examination: others

As noted in Section 4, cumulative effects are briefly covered in relation to other projects (eg. other N. Sea wind farms, oil and gas projects and port and harbour developments), but more fully in terms of the cumulation of the various elements of the project itself—especially the wind farm and offshore transmission. The two sets of economic impacts for the wind farm and for offshore transmission are set out in Section 5 of this document. The ES adds these together to produce summaries of cumulative impacts which in total differ little from the figures for the wind farm alone. The onshore transmission and substation elements are also considered in cumulation with Scottish Hydro Electric Transmission Limited (SHETL) proposals for the upgrade of the existing substation at Blackhillock which is immediately adjacent to the substation.

The cumulative assessment does raise the issue of the potential pressure on the supply chain in both the Study Area and Scotland when other potential wind farm developments in the Moray Firth, Firth of Forth and the Aberdeen OWF are taken into account. Cumulative demand could reduce the capacity of the Scottish supply chain to successfully secure contracts, which could lead to more sourcing from outside Scotland. This could reduce the GVA and employment benefits from the Beatrice project. There could be similar effects from any take-up of shared servicing facilities between projects for the O&M stage. Much depends on the timing of the various projects, and on the use of appropriate mitigation and enhancement measures.

8. Mitigation and enhancement

The ES concluded that, as there were not negative impacts above minor, mitigation measures were not required. However there was scope for enhancement – maximising positive effects or minimising 'not significant' negative ones. The main focus is on maximising local employment opportunities as far as possible to shift GVA and local employment more towards the High Case Scenario. The ES emphasises the importance of alliances in delivering elements of the project:

SSE has entered into an Alliance Agreement with Siemens Wind Power, Siemens Transmission and Distribution, Subsea 7, Burntisland Fabications and Atkins, under which the companies will form an alliance to collaborate on SSE's offshore wind programme.

Also important is the availability of people with the right skills for the offshore wind industry. A range of skills is required across the project stages, including environmental consultants, engineers, planners, welders, divers, technicians and vessel crew. There are significant overlaps with the oil and gas industry which is currently shedding much labour. The ES also notes that the gradual decommissioning of the Dounreay nuclear project and the change of status of RAF Kinloss could also create a valuable pool of labour for the BOWL project. In addition, HIE has indicated that there are people with relevant skills who would return to the Highlands if the right jobs were available. An action plan for energy, *The Skills Investment Plan for the Energy Sector*, has been developed by Skills Development Scotland (2011). This targets the main skills gaps in engineering (marine, structural, civil and mechanical) leadership management, project management welders, turbine technicians and divers.

More specifically SSE has signed a partnership agreement with the University of the Highlands and Islands (UHI) to collaborate on skills training and research opportunities to maximise local benefits from the project. SSE is also using its Open4Business platform as a vehicle for advertising supplier opportunities for Beatrice and for the registering of potential interested suppliers.

9. Actual impacts during project construction

Data availability; contacts/sources; monitoring arrangements

- Existing published data – see various recent presentations/exhibitions/supply chain events (eg November 2016 Engagement Events—very useful summary of contract position); website -- sse.com/beatrice; twitter— www.twitter.com/beatricewind.
- Contacts/sources – SSE Corporate Affairs, Perth – Dr. George Cobb, Sustainability Accountant, email: george.cobb @sse.com; Highlands and Islands Enterprise; Caithness and N. Sutherland Regeneration; Highland and Moray Councils

Economic impacts from contract sources – A picture of the many contracts involved in the project, especially the local (Study Area, and more local/specific locations) employment, and local supply chain benefits (tier 1, 2 contracts etc) can be gleaned by monitoring the placing of such contracts and data on their associated employment and expenditure. The wind farm is being developed with a tier 1 supply chain comprising Seaway Heavy Lifting, Subsea 7, Nexans and Siemens. Some examples of recent contracts are set out in Table 9:

Table 9*: Some examples of Beatrice contracts*

Contract	Spatial impacts - indicative focus only) L=Local Study Area; S=Rest of Scotland; UK=

	Rest of UK; O= overseas
• ***Siemens*** has received a contract to supply, install and commission 84 7MW wind turbines, and provide grid access solution for the Beatrice project, which will feed the power to the grid through ***Nexans***' export cable. The SWT-7.0-154 wind turbines will be erected on jacket foundations in ocean depths between 35 and 56 meters. Siemens plans to produce the corresponding wind turbine blades for Beatrice at its Hull facility. Installation of the wind turbines is scheduled to begin in the summer of 2018. Following commissioning of the plant in 2019, Siemens will also be responsible for service and maintenance for the wind turbines within the framework of a long-term service contract extending over a period of 15 years. The contract also covers remote monitoring and diagnostics for the wind turbines so as to ensure their long-term availability and performance. The logistics concept for this plant also includes the use of a helicopter. For the grid access solution, Siemens will deliver two offshore transformer modules, which are one third smaller in size and weight compared to a conventional alternating-current (AC) platform. Siemens' partner in delivering the offshore grid connection, Nexans, will be responsible for design, supply and installation of the export cable, both offshore and onshore. The OTM's will be linked together to provide the required transmission capacity. Focusing on the core electrical equipment and removing a number of optional ancillary systems made this space and weight reduction possible, which also results in a reduced maintenance regime. The grid access solution will be project managed and engineered from the Siemens Energy Management Renewable Energy Engineering Centre in Manchester, UK.	Primarily O for turbines; but UK blades supply and some project management
• ***Subsea 7*** has confirmed it has secured a major $1billion plus contract for the Beatrice offshore windfarm in the Moray Firth. The engineering, procurement, construction and installation (EPCI) deal will see Subsea 7 deliver wind farm turbine foundations and array cables for the project. In alliance with Seaway Heavy Lifting, Subsea 7 will project manage, design, engineer, fabricate and install EPCI jacket foundations and array cables for the 84 wind turbines, and perform the transportation and installation of the offshore transmission modules.	Primarily O
• ***Atkins*** has been appointed by SHL to carry out the detailed design of the jacket substructure and foundations for the project as part of SHL's EPCI contract with the farm's developer Beatrice Offshore Windfarm Limited (BOWL). 84 jacket substructures and associated foundations for the Siemens 7MW turbine will be installed at varying water depths up to 55 metres which represents the deepest jacket substructures in use for an offshore wind farm anywhere in the world. Design and engineering is well advanced with Atkins' offshore wind team supporting the project from Glasgow and delivered from a number of offices in the UK. Andy Thompson**,** Atkins' offshore wind deliver director, said: *"This is a very exciting project for us as it underlines our ability to design jacket structures for the latest turbines in deep water. This capability compliments our*	S and UK

ability to design XL monopiles for the latest turbines, floating structures for wind turbines in deep waters and fixed offshore substations."	
• ***Siem Offshore Contractors (SOC*)** has been awarded a contract by Seaway Heavy Lifting for the turnkey supply and installation package of the inner array grid cable system for the 588MW Beatrice Offshore Wind Farm. In addition to the submarine cable installation works, SOC will also provide associated materials and services including the supply of the submarine composite cables, cable protection systems and related accessories as well as post-installation termination, trenching and testing services. The 84 wind turbines at the Beatrice offshore wind farm will be connected by an inner-array grid of 91 33kV medium voltage alternating current submarine composite cables with a total length of up to 164km.The offshore works for the inter-array cable system are due to begin in 2017, with the project scheduled to be completed before the end of Q3 2018.	Primarily O
• ***Siem Offshore Contractors (SOC)*** has opened an office in Westhill, Aberdeenshire, Scotland to serve as local project office and act as the focal point for the company's UK market growth strategy. SOC will use the new office to carry out the contract for the turnkey supply and installation package of the inter-array grid cable system for the 588MW Beatrice offshore wind farm. *"We are pleased to be able to contribute to the growth of Aberdeen's renewable energy ambitions,"* said Andy Martin**,** SOC's Project Manager for the Beatrice OWF. It is planned that the office will consist of up to ten full time employees, made up of local workforce where possible supported by head-office staff and domestic and international subcontractors as required. It is envisaged that future UK contracts will be managed via this office.	Primarily S
• ***Swire Blue Ocean*** has been awarded a contract by Siemens to supply a wind farm installation vessel for the installation of 84 Siemens wind turbines.	
• ***Nigg*** will be the construction and marshalling port, storing, pre-assembling and preparing the turbines ahead of installation offshore. Scottish Renewables and WWF Scotland have responded to news that Global Energy Group and Siemens have signed a contract securing the use of Nigg Energy Park for the Beatrice Offshore Wind Farm project. Lindsay Roberts, Senior Policy Manager at Scottish Renewables, said: *"The contract will help breathe new life into this Highland port. "Scotland's offshore wind industry has huge potential for both our economy and our environment, and it's great to see Nigg reaping the benefits.* (NB –Nigg undergoing major £350m expansion to be key supply port for Scottish N. Sea for foreseeable future. The development, which is a Scottish Government National Planning Framework (3) project, is scheduled to be completed by 2020).	L and S
• ***The Port of Cromarty Firth in Invergordon*** has been awarded two contracts by Seaway Heavy Lifting (SHL) to support the BOWL project. The first of the two new contracts is for berth and laydown space and the second is for office space at the port. Work will commence during the second quarter of 2017 and the installation activity is scheduled for 2017 and 2018. Alone, these two renewables contracts are worth approximately 10% of the port's annual turnover. The project will utilise the port's newest	L and S

development, Berth Five, which was a proactive investment of £25m made by the port to attract more work from the renewables sector.	
• ***Bladt Industries*** (Aarlborg, Denmark) will provide 30 x 4-legged jacket foundations for the wind farm. They will have height of up to 70m and weigh approximately 900 tons each.	O
• ***Burntisland Fabrications (BiFab's)*** Arnish facility began work on the transition pieces and piles for the Beatrice offshore wind farm in mid-October, increasing the workforce at the site by 71 people, according to SSE. BiFab, a Fife based company with facilities at Burntisland, Methil and Arnish, won two multi-million pound contracts with BOWL Tier 1 suppliers Siemens and Seaway Heavy Lifting to provide a total of 26 jackets. Martin Adam, BiFab's Operations Director said: *"The award of the BOWL work scope to Bifab has meant Arnish and local economy have now benefited from an increase of 71 well paid jobs which has come at a seasonal time of high costs due to winter climate and festive expenditure. The increase in work will also go some way in lessening the impact on the local economy of jobs lost in the offshore sector." Going forward into 2017 BOWL work will continue at Arnish until end of March and ensure the working yard is visible and available so new work, if available, can be placed going forward."* Alongside BiFab, Beatrice foundations have put to work Bladt Industries, Smulders, Sif, and EEW SPC. • However Seaway Heavy Lifting came to loggerheads with BiFab about the delivery of the contract, and heavy financial losses were incurred by BiFab, with associated loss of employment.	L and S
• ***Granada Material Handling*** has been contracted by BiFab to design, manufacture, deliver and commission 26 davit crane units for the BOWL project. Each of the Granada Python crane units has been specifically designed for Beatrice and the challenging marine environment in which it will operate, the Manchester-based company said. One Python crane unit will be fitted to each of the 26 platforms being supplied by Burntisland. Each crane unit measures approximately 4 meters in height, 7.5 meters in radius, and weighs 2,000 kgs. The maximum lifting capacity of 1250 kgs is needed to hoist the heavier serviceable components from the supply vessel to the laydown area on the platforms of the foundation platform. Granada will deliver the crane units over an 8 month period. *"The BOWL contract is not only great news for Granada but also for our UK based supply chain,"* Mark Sidwell, director of Granada Material Handling, said. *"Granada has ambitious plans for this market sector and having supplied over 600 offshore davits is one of Europe's leading offshore wind farm davit crane suppliers. We are currently working with designers, wind farm developers and turbine manufacturers to further enhance the product range to ensure the very latest developments in lifting technology are made available to the rapidly expanding and ever developing offshore renewable market."*	UK and S
• ***JDR***, a leading supplier of subsea power cables and umbilicals to the global offshore energy industry, based in Hartlepool, has been awarded a subcontract by Siem Offshore Contractors GmBH to supply subsea power cables for Beatrice.	UK
• ***Bauer Renewables*** has been awarded a sub-contract by SHL to design, build, test and operate specialized equipment – the BAUER Dive Drill C40 – to execute relief drilling services for the foundation piles at Beatrice. SHL will install 84 jackets for the foundations of the wind farm's	UK and O

Siemens 7MW wind turbines. Each jacket sits on four piles. The soil conditions are described to be sand and hard clay with occasionally boulders. Relief drilling may be used when a pile hits early refusal during driving. At that time, the top of the pile will be most likely below water table. The Bauer Dive Drill C40 will be lifted into the pile, clamp itself to the inside and drill down to pile tip or a certain distance beyond to remove obstructions and to relief the pile from the inside friction. After recovery of the Dive Drill C40, pile driving resumes to drive the pile to final depth. Bauer Renewables is the UK subsidiary of Bauer Spezialtiefbau GmbH, a German foundation construction specialist. The equipment will be supplied by Bauer Maschinen GmbH, another member of the Bauer Group.	
• ***Babcock,*** a UK engineering company, has won a contract from Siemens to build two Offshore Transformer Modules (OTMs) for the Beatrice project**.**	UK
• ***GAC UK*** has been appointed by Seaway Heavy Lifting (SHL) to provide shipping services support for the construction and installation of the 84 new turbines. SHL has appointed GAC to provide a range of shipping, logistics and support solutions. These will include ships agency and handling of vessels delivering materials and equipment for the construction work, with a location in the Cromarty Firth being used as a storage hub for deliveries to the offshore site. GAC will also provide support for other vessels that will be involved in the project, such as CTVs, multi-cats and barges at all ports in the UK, except Wick. Both of SHL's heavy lift crane vessels will be deployed: Stanislav Yudin from April 2017 to April 2018, Oleg Strashnov from August to October 2017 and again from May to July 2018.	UK and O
• ***Fathom Systems*** has won a contract to supply a turnkey service of design engineering, procurement and manufacture of specialist electrical distribution equipment to be installed in each of the 84 turbine transition pieces. The scope of supply for the project is scheduled for delivery throughout Q1 and Q2 2017. The contract will be carried out by Fathom Systems Electrical Services Division.	L
• **6** ***Alpha Associates*** is carrying out comprehensive unexploded ordnance (UXO) risk management for the Beatrice OFW, which will eventually result in issuing a final UXO safety clearance certificate**.** Upon completion, the work will confirm that the prospective threat to installation activity presented by UXO has been reduced to as low as is reasonably practicable (ALARP) – the legal and safety standard for munitions risk management.	UK
• ***ERSG***, a UK-headquartered supplier of contract and permanent placements to the energy sector, has been chosen to provide contract wind professionals for the Beatrice offshore wind farm project.	UK
• ***TRS Staffing Solutions*** is one of 4 suppliers making up the recruitment framework to supply offshore wind contractors to SSE for BOWL (July 2016)	UK?
• ***Sgurr Energy***--the scope of the three year contract will include regular monitoring of construction and installation, checking progress and confirming consistency with the final design, reviewing permits and environmental requirements and undertaking site visits including factory	S

and construction site visits. The construction monitoring appointment follows a one-year role as lenders' technical advisor for BOWL and participating lenders, in which SgurrEnergy supported the project to financial close. SgurrEnergy will also be providing operational support for the first five years of project operation. It will undertake risk management monitoring and continually review the project's risk profile in accordance with the construction budget. Fiona Shaw, senior renewable energy consultant at SgurrEnergy, said: *"Involvement in what will be the first commercially operating offshore wind farm in Scottish waters has been an extremely rewarding experience. We are proud to have supported the project and look forward to our continuing involvement through the construction phase and into operations, ensuring that the lenders' interests continue to be met."*	
• ***Wick-based GMR Henderson*** has started the initial demolition and preparatory works ahead of the renovation of the two historic buildings in the Wick Harbour which will serve as the O&M base for the 588MW Beatrice offshore wind farm. The buildings, originally designed by renowned Scottish engineer Thomas Telford in 1807 to support marine work in Wick, will be brought back to maritime use once complete in 2018. Gerald Henderson, Director of GMR Henderson, said: *"These Thomas Telford buildings have stood in Wick for over 200 years and their sympathetic renovation is very important to Wickers like myself, so we are very pleased to have been awarded a contract to start the renovation works. Of course there are many benefits to working on a project round the corner including the small commute in the mornings. We can be part of a project that, when completed, we will be able to see and take pride in every day."* Beatrice Offshore Windfarm Limited appointed BAM Nuttall as the principal contractor for the renovation works on the two buildings in February 2017. BAM Nuttall in turn hired GMR Henderson for the demolition and preparatory works.	L

Unlike the main AOWFL project, our research does not have detailed access to the Beatrice contractors, so the use of this bottom–up/ outward–working contract by contract approach is very limited in terms of comprehensiveness of coverage, and in the accuracy of spatial implications, but it is rich in terms of actual contracts placed, some of which are clearly beneficial to various local economies associated with the project, but others of which will have high local leakage.

Economic impacts from recent I-O studies (i)

An alternative approach, which has been used for the Beatrice project, is a modelling approach using an Input-Output (I-O) model. *The I-O economic model calculates the direct impact from the project expenditure, as well as the ripple effect across the economy from supplier expenditure (*indirect impact) *and employee wage spending throughout the supply chain* (induced impact). *The model generates the economic impact through two key indicators – contribution to GDP and years of full-time employment supported* (BOWL, 2017a). The 2017 Beatrice I-O model applies only to the initial development expenditure and construction capital stages of the project. It does not include the subsequent 20-25 years operational stage of the project. The starting point of the model is the Tier 1 expenditure of £2.6bn, broken down by where the money has been spent

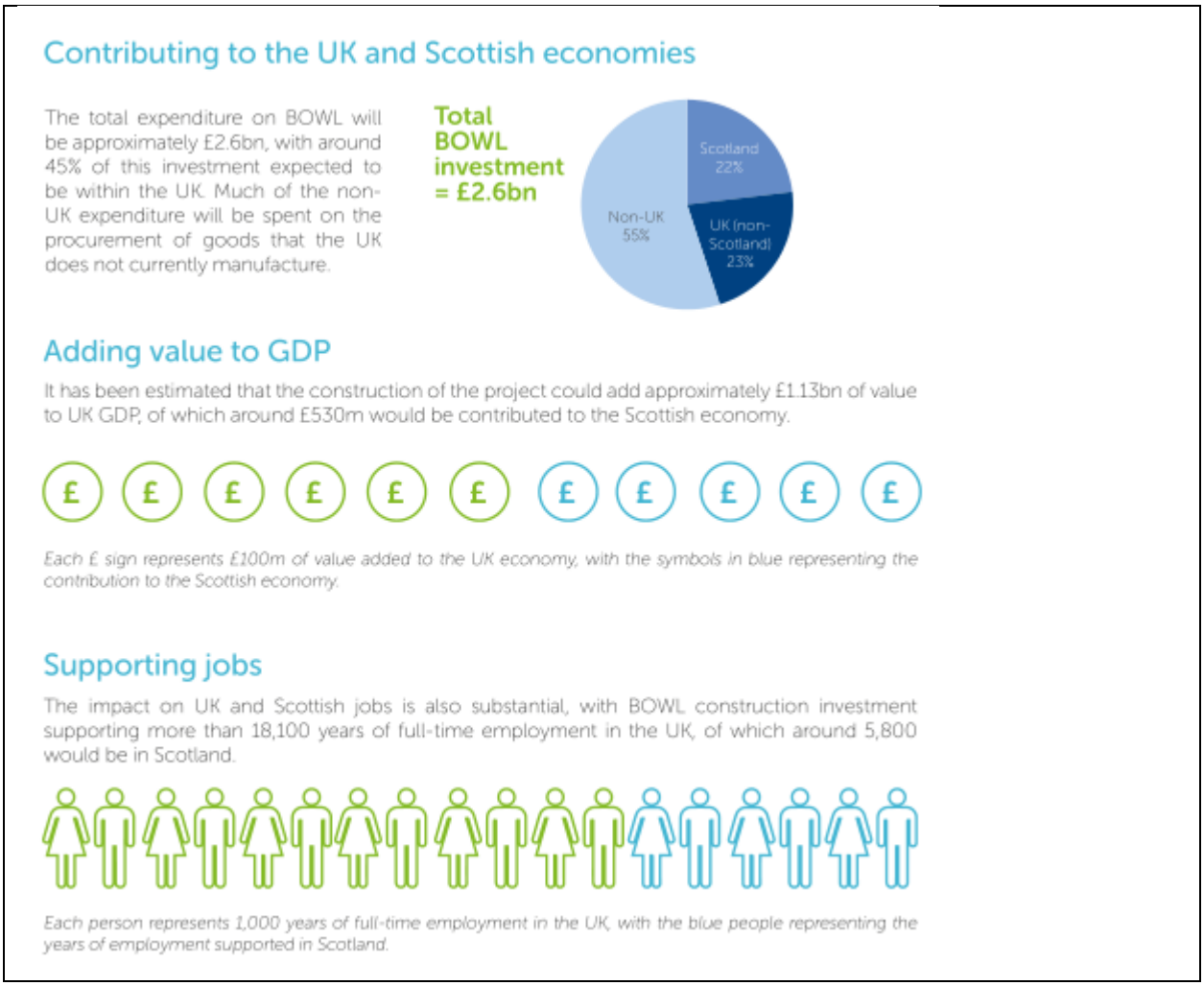
geographically, and by type of spend or by supplier name where possible, up to the end of construction in 2018. A brief summary of the methodology, including its strengths and limitations, is included in a separate document (BOWL, 2017b). A summary of the findings of the I-O modelling study is set out in the following table. The model does not distinguish between local impact and Scotland–wide impact. For the latter, the estimate is £570m of investment (c22% of total), £530m of GVA and about 5800 years of full-time employment.

Comparison with the ES predictions is complicated by the subsequent 40% reduction in the size of the windfarm. Although, it is interesting that for Scotland as a whole the low case employment prediction for development/construction of the initially much larger wind farm is 5800 person years (3100 direct, and 2700 indirect and induced); this is exactly the same as predicted in the I-O model for the construction of the much smaller project. The low case GVA estimate in the ES for development/construction is much lower than that from the I-O model, at £313m. One implication (although there may be other factors) that might be drawn from these comparisons is that there has been some limited shift away from the low case scenario, as a result of local/Scotland supply chain initiatives/ enhancement policies.

Further economic impact assessment draws on the Local Multipier 3 (LM3) model developed by the New Economic Foundation (NEF 2017). The LM3 analysis seeks to understand and quantify how and where the construction investment is re-spent in the economy. The approach has subsequently been automated by LM3Online as a simple way of measuring local economic impact. The modelling undertaken for the early construction stage indicates a project multiplier of 1.44 for the project overall, 2.33 for local suppliers and 1.13 for non-local suppliers, which provides some evidence of the benefit of local spending to the local economy and community. In this study, “local” was defined as being the 750 closest businesses to the site that operate in wind farm supply chain industries. However, the calculation also considered spending that first exits the local area, but then re-enters it. The study concluded:

At the start of BOWL, SSE set themselves the target of 30% of direct spend going to local suppliers (£144m). So far they have achieved 82% of that target (£118m). As indicated by the local Supplier LM3 ratio vs. non-local Supplier LM3 ratio , ***further work to steer direct spending toward local suppliers will have a disproportionately positive effect on the LM3 ratio, given their higher propensity for local respend.***

Figure 4: *Some outputs from Beatrice I-O model*



Source: BOWL (2017a)

Economic impacts from recent I-O studies (ii)

A second study, *Economic Impact of Beatrice Offshore Windfarm Ltd,* again using an Input-Output (I-O) model, was published by Biggar Economics (July 2019). This study covers the early development (DEVEX) and construction stage (CAPEX); it also covers the O&M stage (OPEX) (see s10 of this report). Like the previous study, the methodology is applied to two study areas – Scotland and the UK; unfortunately it does not cover the local study area (Moray, Highlands and Aberdeen/Aberdeenshire). Contract expenditure data (provided by SSE Renewables) was categorized as one of Scotland/other UK/non-UK; for I-O sectors GVA-turnover ratios were applied to give a Direct GVA assessment and turnover/employees ratios were applied to give Direct Employment job years. Type 1 and Type 2 Multipliers of c0.6 and c0.3 were applied to allow for Indirect and Induced GVA and employment. CAPEX outcomes from the modelling include Capital Expenditure (GVA) of £450m (Scotland) and £1270m (UK), and 6940 job years (Scotland) and 18,710 (UK).

Social impacts

As noted earlier, since the conclusion of the ES and the application/assessment process, Wick and Buckie have been chosen as service bases and it is likely that associated port development to accommodate the project will have some positive regeneration impacts for these two small port communities. It is estimated that the Wick Harbour investment for the O&M stage of the project will be of the order of £10m. Local areas will also benefit from projects funded via the Beatrice Community Benefits Fund.

Beatrice Community Benefits Fund (CBF)

The CBF was established in 2016. It has an available total of £6m, split between Highland (£4m) and Moray (£2m), and equally between a Beatrice Partnership Fund (BPF) and a Local Fund for each area (ie £1m Partnership Fund and £1m Local Fund for Moray). The community fund is in addition to the £28m that BOWL is paying into the Crown Estate's Coastal Community Fund as part of its seabed leasing agreement.

The size of the community fund did raise some local concern. *For example, Councillor Deirdre Mackay, East Sutherland and Edderton, has worked out that the area will get just £160,000 per annum from the £2.6 billion project. She said it was the "smallest return in the history of industrial development in the Highlands". Her frustration is exacerbated by the fact Sutherland is unlikely to gain any jobs from the scheme despite a promise that Helmsdale and Lybster harbours would be used to service Beatrice. She said: "Beatrice windfarm will have a massive visual impact on our eastern seaboard – it will be right in our face and the only way to offset this is to get a fair level of community benefit." An SSE spokesman said: "The £6 million community fund associated with the Beatrice Offshore Windfarm Limited (BOWL) development, of which SSE owns a 40 per cent stake, has been agreed by the BOWL board following consultation with a number of stakeholders including Highland and Moray councils. It was developed using the Scottish Government's 'Good Practice Principles' and is wholly consistent with both Scottish and UK government guidance. Specific impacts and benefits that Beatrice will bring were considered – including up to £224 million in local socio-economic benefits". It is understood developers met with Highland Council leaders to discuss the level of community benefit but ultimately set the figures themselves. North councillors have been told the amount is 'non-negotiable'*. (Northern Times, 07/11/2016)

The Partnership fund for Highland will cover the communities on the east coast of Caithness and Sutherland. In Moray, it will include all coastal communities and the four local communities, namely Buckie and District, Strathisla, Lennox and Keith. The first round of applications opened in late 2016, for bids of from £10,000 up to £20,000. *'The purpose of the fund is to support activities that will enhance the area and the fund has the potential to provide real and significant benefits to the local community over the coming years. SSE has, for a long time, believed the communities in which we operate should benefit the most from our Community Benefit Funds so we'll be working closely with all parties, to ensure the areas around the Beatrice Offshore Wind Farm benefit the most'. In order to be eligible for funding, projects will achieve one or more of the following priority themes'.*

- *Creating opportunities – increased opportunities for education and employment;*

- *Empowering communities – build resilience and protect vulnerable residents;*
- *Building sustainable places – stimulation of meaningful community regeneration*

The focus of the Partnership Funds is on more long term, strategic and transformative projects. For the Moray Partnership Fund, the first round has £190,000 available for bids, and it is anticipated that the same amount will be available each year up to the end of a five year period. The amounts are doubled for the Highlands Partnership Fund. Decisions on the allocation of Partnership Funds are made by an Independent Panel chaired by Fraser Grieve from the Scottish Council for Development and Industry (SCDI). The panel consists of:

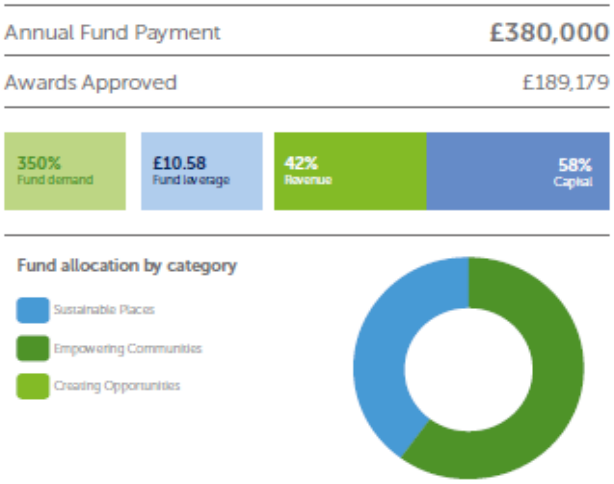
- David Shearer - Fund Co-ordinator at the Caithness and North Sutherland Fund
- Fraser Grieve - Highlands and Islands Regional Director, Scottish Council for Development & Industry
- Professor James Hunter - Emeritus Professor of History at the University of the Highlands and Islands and former Chairman of Highlands and Islands Enterprise
- Sarah Medcraf - Chief Executive of Moray Chamber of Commerce
- Morven Smith - Head of Community Investment, SSE

List of successful projects from the first allocation of the Partnership Funds for the Highlands and Moray regions are set out in Figures 5 and 6. For the Highlands region, approximately 45% of the Year 1 available funds were allocated, in a mix of revenue and capital projects, mainly for empowering communities, such as the renovation of an old scholl house as a community hub. For the Moray region, almost all of the available Year 1 funds were allocated largely as capital; these were mainly for sustainable places, including for example the WDCs Scottish Dolphin Centre, which received £46,544. In contrast to the Partnership Funds, the Local Funds exist to support the community organisations closest to the wind farm to achieve their aims. Only groups from the immediate local area to the development are eligible to apply. By mid-2019, 58 projects had been supported under the Partnership Funds, with an average grant of £31,000, and 116 projects had been supported the Local/Community Funds, with an average grant of £6,000 (Biggar Economics 2019).

The BOWL project has also undertaken a wider analysis of the potential impact of the community benefits funds using a Social Return on Investment (SROI) approach for the projects that applied to the first round of grant funding from the BPF in 2017. *SROI is a methodology that lets you understand the wider value as a result of investing money. It considers the social, economic and environmental impacts of an investment. Critically, all impacts are valued in monetary terms, enabling a direct comparison between impacts and investment. The approach considers the value created for all stakeholders impacted by an investment, not only the intended beneficiaries* (BOWL, 2017a). The project used a guidance document on the application of the SROI approach to Beatrice, produced by the New Economics Foundation (NEF, 2017). This draws on a Guide to Social Return on Investment produced by central government (Cabinet Office, 2009). Crucial to the approach is the interrogation of stakeholder grant applications to identify anticipated impacts of potential successful applications and the valuation of these impacts over the lifetime of the successful projects. For the first round of the BOWL BPF, it was estimated that for every £1 spent

by the fund, there would be £3.21 generated in wider value. On this basis the £6m fund would create almost £20m of social value when fully distributed.

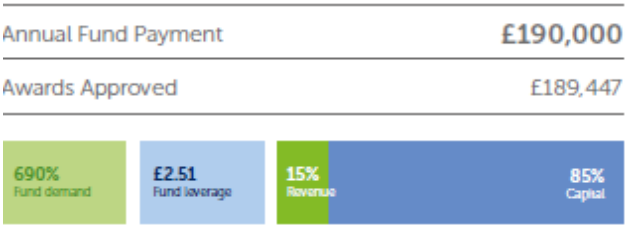
Figure 5: *First round allocation of project funding for the Highlands Partnership Fund*



Category	Organisation	Award
	Pulteneytown Peoples Project Ltd To deliver a social care project	£36,000
	The Embo Trust To renovate the old school for use as a community hub	£33,333
	Engaging with Activity To employ a co-ordinator over a two year period to develop and deliver a project to combat loneliness at the Brora Wellbeing Hub	£30,864
	Garbh Allt Community Initiative To purchase of four crofting townships near Helmsdale and develop tourist opportunities on the land	£29,918
	Kyle of Sutherland Development Trust To purchase an electric vehicle which will facilitate the delivery of a number of projects in their area	£25,045
	Friends of John O'Groats Trail To assist with the construction elements of two paths on the east coast of Sutherland	£21,651
	Ormlie Community Association To deliver family support service improving the life chances of mums and their children in Wick	£12,368

Source: Beatrice Highland Partnership Fund (website)

***Figure 6**: First round allocation of project funding for the Moray Partnership Fund*



Category	Organisation	Award
■	**Morayvia** To increase capacity at the science and technology centre	£50,000
■	**Whale and Dolphin Conservation Society** To install a new biomass boiler which will significantly improve the centre's capacity as a visitor attraction	£46,544
■	**Covesea Lighthouse Community Company** For the internal fit-out of an education and heritage centre	£40,000
■	**Skill Force Development (Scotland)** To deliver an education and mentoring programme for 40 young people	£15,076
■	**Keith and Dufftown Railway Association** To replace the existing wooden sleepers with concrete sleepers to reinforce the line between Drummuir and Keith junction	£15,000
■	**REAP** To fund a part-time energy advisor over a two year period to promote opportunities to tackle fuel poverty	£12,500
■	**Alves Hall** To support the upgrading the village hall, which is the designated emergency hub for the local area	£10,327

Source: Beatrice Moray Parnership Fund (website)

As an aside -- the Highland Council asked the Scottish government in October 2016 to help local authorities in setting a recommended level of community benefit for offshore wind developments. It has also asked for rapid progress to be made to agree a position on the devolution of Crown Estate incomes to Scotland and beyond to local authority level due to the anticipated rental income for Crown Estate of £56 million from the Beatrice offshore wind farm.

10. Actual impacts during project O&M stage

As discussed in section 9, the 2017 Beatrice I-O model applies only to the initial development expenditure and construction capital stages of the project. It did not include the subsequent 25 years operational and management (O&M) stage of the project. At the time (2017) it was premature for details of actual socio-economic impacts during the O&M stage which would not be fully operational until mid-2019. However, the 2019 I-O study does very usefully include an assessment of the actual economic impacts of the project into O&M. Broadly using the approach outlined in section 9, the OPEX employment estimate for Scotland is 370 jobs per annum, with discounted operational expenditure (at 3.5%pa) (GVA) in Scotland over the 25 years of £540m. These figures compare with the original ES predictions of c £430-660m for Scotland O&M GVA. It is not clear whether these ES figures are discounted; they should also be reduced pro-rata (40%) to allow (very crudely) for the smaller actual project; whatever the assumptions, the 2019 GVA estimate is high compared with the earlier predictions predictions. Similarly for employment, the comparisons are 370 jobs in Scotland against predictions of 350 O&M jobs in total (UK+) for a 1000 MW project. However, none of this should downplay the very real economic significance of the O&M stage in the project lifecycle.

In terms of local impact, the Wick area is likely to be a major beneficiary during this stage, and the port renovation should bring not only benefits from Beatrice servicing, but also from other potential users. Opportunities at Wick are expected to include onshore operational staff, offshore turbine technicians and skippers for the Crew Transfer Vessels which will transport the offshore teams to and from Beatrice. It is estimated that the Wick Harbour investment for the O&M stage of the project will be of the order of £10m, and that there will be about 90 O&M jobs based in Wick (SSE Vimeo, July 2017), from offshore technicians to onshore office administrators. Buckie is also likely to have some additional benefits through the O&M stage although on a much smaller scale.

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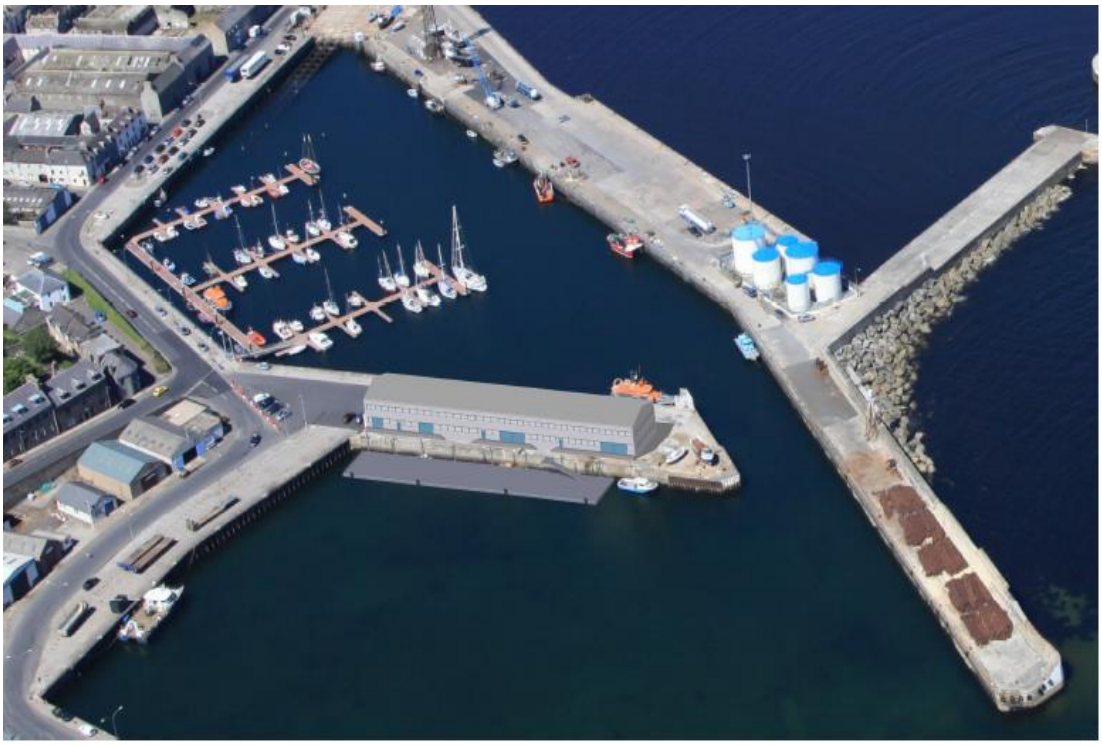
***Figure 7**: Artist impression of Wick Harbour Beatrice O&M facility*



11. Some conclusions and project good practice lessons

Some conclusions

- good recognition of importance of socio-economic impacts, but little focus on social dimension in the initial ES assessments and in project implementation; social issues only emerge significantly in the evolution of the Community Benefit Fund; there is little or nothing on community impacts, perception issues and stability and cohesion
- strong economic focus on GVA and employment, but use of high and low case scenarios results in a very wide ranges of impacts and great uncertainty in predicted impacts, especially for the construction stage of project; this is somewhat less marked for the O&M stage
- good spatial disaggregation of predicted impacts in the ESs (Study Area, Scotland, UK etc), but not followed through into monitoring (both I-O studies) with unfortunately no specification of Local (Study Area) impacts – to compare with predictions
- there are major leakages of the economic benefits of the construction stage investment out of the Study Area/Rest of Scotland, but there are still substantial additions to Scottish and UK GVA and employment
- comparison of outcomes from the 2017 and 2019 I-O reports with the ES predictions is complicated by the subsequent 40% reduction in the size of the windfarm post-ES. The

2019 Biggar study estimates construction stage Capital Expenditure (GVA) of £450 m for Scotland, and 6,940 job years; these compare with ES GVA estimates ranging from c£300m - £550m for a much larger project (if adjusted according to the size of the actual project, these would be c£180m-£330m), and 5,800 -10,000 job years (again if adjusted according to the size of the actual project, these would be c3,500 - 6,000). Implications of this --- the outcomes have been closer to the high predicted impacts rather than low, and/or the recent 2019 estimated outcomes are on the high side (?).

- in terms of predicted GVA and employment years gained from the project (Direct, Indirect and Induced) the local Study Area gains most over the project life from the O& M stage; the 'actual' figure reported for O&M activities in Wick alone appears to support this prediction. The 2019 Biggar study does not report on the local area economic impacts, focusing only on Scotland and the UK as geographical areas. For example, It indicates discounted GVA of £540m for the full O&M stage in Scotland compared with £460m in Scotland for the construction stage. Again the 2019 estimated outcomes are high in relation to ES predictions, and caveats likely apply at both ends of the prediction spectrum (2010 and 2019).
- policy initiatives to enhance positive impacts, with an apparent shift well away from the low case, appear to be favourable to Scotland (and the local Study Area?), as reflected in the 2019 estimates.
- A more critical view of local benefit from Beatrice construction was provided by GMB Scotland Secretary, Gary Smith who said (July 2019), " The Scottish renewable lobby and every politician that's promised a green jobs revolution should be cringing not celebrating, given that Scotland's manufacturing share of Beatrice was less than 4% of the total project value" (Figure not validated for this study).
- the implementation of the project is meeting some of the expectations (requirements of local councils); for example, Highland Council has achieved its aim of using the port of Wick; Moray has achieved the use of the port of Buckie; there has also been good work by SSE with bodies/ businesses etc to maximise returns; but it is difficult to check on the aim of maximizing the amount of GVA coming to the Study Area as there is no Study Area disaggregation in the 2017 and 2019 I-O models.
- there does not appear to be a consistent approach to monitoring the actual socio-economic impacts through the various project stages, with only the (useful) I-O model for the development/construction stages, but no monitoring of key stakeholders (and especially the workforce), and of social impacts (other than the impacts of the CBF).

Project good practice lessons

- some high level monitoring via the recent I-O study which uses actual contract data, although the details of the data are not available for analysis, and such I-O studies involve a whole set of assumptions (eg especially on geographical splitting of contract expenditure, and various ratios and multipliers)

- innovative Social Return on Investment (SROI) approach also applied to actual Community Benefits Fund data, although again the details of the data are not available for analysis, and the level of multiplier impact seems high
- important argument noted (although not particularly followed through in terms of cumulative impacts), is that this large OWF project is also making important socio-economic contributions, along with other projects in Scotland, in improving/sustaining the supply chain (in the face of oil and gas industry decline), and enhancing key infrastructure. **In particular, in relation to infrastructure, the development and modernization of a cluster of port sites which could support an offshore wind sector, at Nigg, Invergordon, Wick and Buckie, is a very important outcome from this project, which may be of considerable significance for future projects**
- use of policy initiatives to enhance positive impacts, with an apparent shift well away from the low case, appear to be favourable to Scotland (and the local Study Area?), as reflected in the 2019 estimates
- innovative approach to distribution of Community Benefits Funds, although some queries about the process used to arrive at the size and nature of the Fund

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