Technical Report 4: *European Offshore Wind Deployment Centre (EOWDC) (Aberdeen Offshore Wind Farm): Socio-Economic Impacts Monitoring Study*

Final Report

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Executive Summary

Aims: This study is one element of the European Offshore Wind Deployment Centre (EOWDC) Environmental Research and Monitoring Programme supported by Vattenfall. The focus of this element of the whole programme is on the socio-economic impacts of Offshore Wind Farm (OWF) projects on the human environment. The EOWDC study provides the most detailed element of the socio-economics impacts research programme. Through detailed monitoring of the EOWDC over its lifecycle to date, the research seeks to provide a more robust evidence base of actual socio-economic impacts - particularly at the local and regional level - and so help to reduce uncertainties in future assessment/practices. The research compares these, as far as is possible, with the predicted impacts in the Environmental Statement (ES) for the project.

The EOWDC is a relatively small OWF with 11 turbines/c 93.2MW, and with total expenditure (Totex) of about £280m. It is located 2.4km offshore. It is also an innovative project in terms of technology. It has offshore and onshore elements; the latter includes a sub-station at Blackdog, and a 7.5 km cable connection to SSE's Dyce sub-station. Construction was completed in the Summer of 2018, and the first power flowed into the grid in September of that year.

Approach: the research approach included regular meetings/telecoms with Vattenfall project staff; workshops with representatives of local authorities/agencies and with the local Belhelvie Community Council to explore evolving project impacts and responses; and various surveys through the lifecycle of the project to identify actual socio-economic impacts. The ES (DTZ, 2011) uses Inner (Aberdeen and Aberdeenshire), Wider (Scotland), and UK study areas. The focus here is on the Inner and Wider spatial areas. There was good data for the research from Vattenfall contracts spending; onshore tier 1 contractor contracts data, and sub-station workforce survey; community responses to proposed Community Benefits Fund; various community surveys; and press coverage of the project over its lifecycle. However, data was much thinner for the offshore construction stage activities of the two main tier 1 contractors.

Structure of the Report: the report has five parts. Part A provides an Introduction and Overview of the study. Part B analyses the findings gained on the actual economic impacts over the lifecycle to date of the EOWDC. It also seeks to compare the actual impacts with those forecast in the ES. The approach is largely quantitative, focusing on employment and wider economic effects. Part C concentrates on the social impacts, including analyses of various perception studies undertaken by the project and by Vattenfall (re Community Benefits Fund). The data on the social impacts is generally more qualitative in nature. A further section, Part D, very briefly reviews socio-economic impacts on the two floating OWF developments off the Aberdeenshire coast -- Hywind and Kincardine. A final section, Part E , draws out some conclusions on the actual socio-economic impacts and compares these, as far as is possible, with the predicted impacts in the ES for the project. It also summarises cumulative effects of the EOWDC with the adjacent floating OWF projects.

Summary of Economic Impacts Findings: the EOWDC project performed well against economic impact predictions for the onshore construction and for the early O&M stages of the project life cycle -- stages that tend to be underplayed in EIAs and in the ES documentation, but which are especially important for local economic benefits. The O&M stage is particularly

significant in terms of the high local percentage of the total economic impacts, over a 20-25 year life.

In contrast, for this project, the local and Scotland wide economic benefits from offshore construction appear to be very limited, and much less than predicted. There are some caveats, relating to the relatively small size of the EOWDC project, and data gaps from two key tier 1 contractors, but even so, the actual impacts are estimated as being low and well below those predicted in the original ES documents. The nearby Hywind floating wind farm project appears to have even larger construction stage leakages, and indeed, there may be even less local economic benefit from the O&M stage than anticipated in the low impact scenario for that project. This leakage of the offshore construction stage benefits is a major concern to local, regional and national authorities, as noted by the Scottish Energy Minister at an offshore wind summit in Edinburgh in early 2020 – '*Scotland is the ideal location for offshore wind, but recent projects have not delivered the significant economic opportunities we want to see for Scottish businesses'.*

Summary of Social Impacts Findings: there was very little coverage of social impacts in the ES documentation, and there was no evidence of any significant actual impacts on social infrastructure, such as housing and local services. However, from the various surveys, there were some community concerns, although these lessened over the life cycle.

Community views of the project during the consenting and pre-construction stage comprised elements of 'resistance' due to uncertainty over the number, size and location of the turbines. Parts of the community felt 'blighted' due to decades of historic legacy of unwanted development and made vocal objection to the development. Yet others expressed that they did not mind the proposed development and sought to 'get on board' with the project. These differing views (possibly somewhat exaggerated by the media) did result in some loss of social cohesion within the communities during the pre-construction and construction stage, but this was less of an issue into the early O&M stage.

Concerning visual impacts during construction of the onshore and offshore elements, most respondents (over 50% in each case) felt that the impacts were as expected. These dropped slightly in a later survey of community views during the O&M stage, when 'as experienced' or 'not experienced' was the dominant response. Many responses used the word 'surprise' in relation to the wind turbines – how big they are and how close to the shore. The biggest 'feeling' in relation to the windfarm was that it was '*good to see clean energy being generated'* (80%). However, a number of qualitative comments indicate some conflicted viewpoints e.g. *'not great for the seascape but the renewable energy is necessary'*.

Of importance for management of both social and economic impacts is the engagement strategy of the developer.There is evidence of much good practice in the Vattenfall approach, well managed by the project's Local Community Liaison Officer, throughout the life cycle from pre-construction through to early O&M. The introduction of the EOWDC Community Benefits Fund (CBF), known as the *Unlock our Future Fund,* is another very important feature of long-term community engagement.

PART A: INTRODUCTION AND OVERVIEW

1. Research Approach

1.1 Aims of the research

This study is one element of the European Offshore Wind Deployment Centre (EOWDC) Environmental Research and Monitoring Programme supported by Vattenfall. The focus of this element of the whole programme is on the socio-economic impacts of Offshore Wind Farm (OWF) projects on the human environment. There are several elements to the research: literature review, examination of the socio-economic content of UK and other Non-UK State Environmental Statements (ESs), and comparative case studies of the Beatrice and Hornsea OWFs.

This in-depth study of the Aberdeen Offshore Wind Farm provides the most detailed element of the research programme. Through detailed monitoring of the Aberdeen Offshore Wind Farm, over its lifecycle to date, the research aims to provide a more robust evidence base of actual socio-economic impacts - particularly at the local and regional level - and so help to reduce uncertainties in future assessment/practices. The research compares these, as far as is possible, with the predicted impacts in the Environmental Statement (ES) for the project. Further, as the consenting process in Scotland occurs at both national and local decision-making levels, it will help inform impact assessment and consenting for OWF more widely.

The EOWDC is a relatively small OWF with 11 turbines/ 96.8 MW, and with total expenditure (Totex) of about £280m. It is located 2.4km offshore. It is also an innovative project in terms of technology. It has offshore and onshore elements; the latter includes a sub-station at Blackdog, and a 7.5 km cable connection to SSE's Dyce sub-station. Construction was completed in the Summer of 2018, and the first power flowed into the grid in September of that year. The monitoring study seeks to identify actual economic and social impacts for key steps in the lifecycle, including the pre-construction, peak construction, and early operation and maintenance (O&M) stages.

1.2 Research activities

The research approach included the following activities:

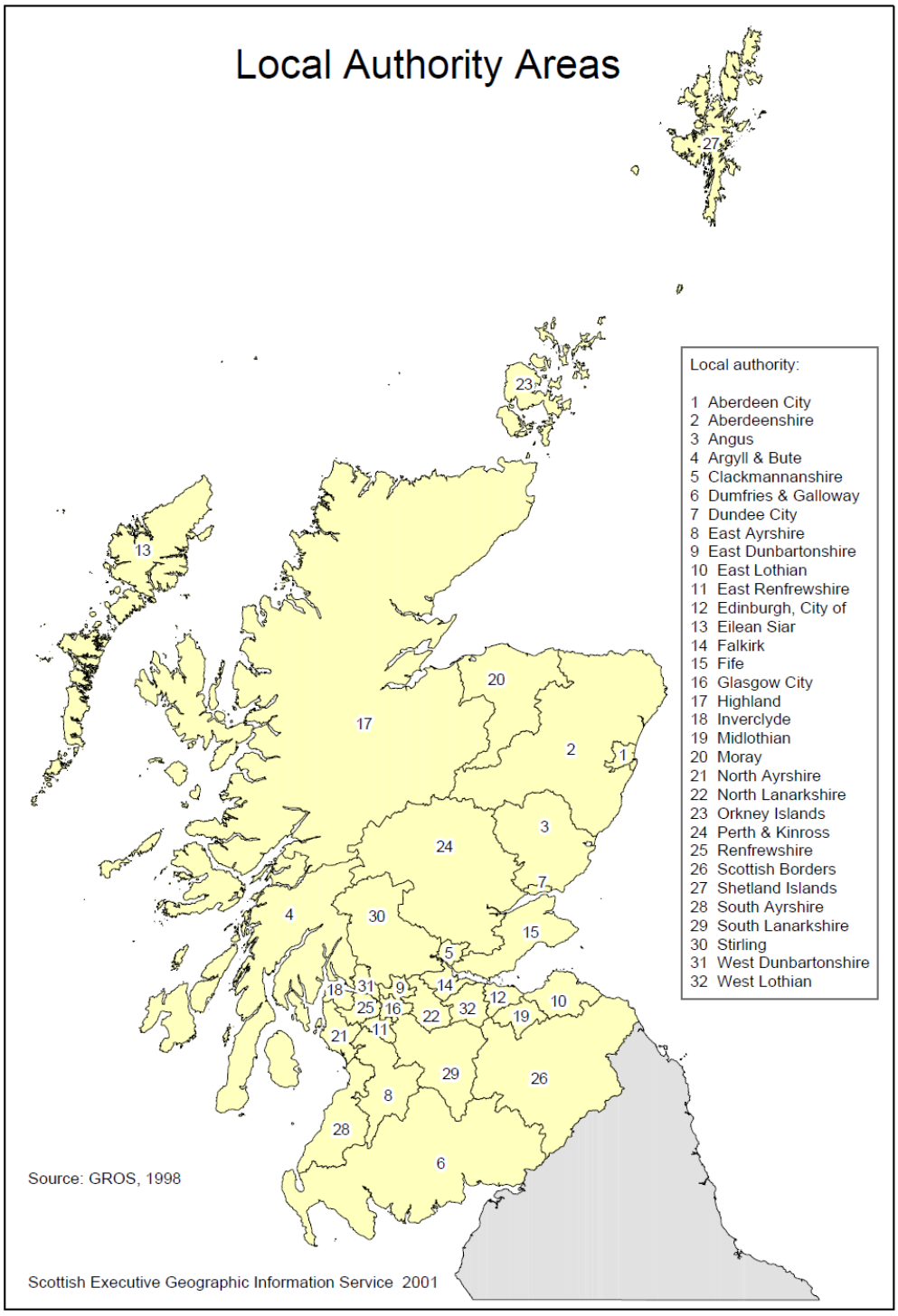
- regular meetings/telecoms with Vattenfall project staff
- workshops with representatives of local authorities/agencies and with the local Belhelvie Community Council to explore evolving project impacts and responses
- various surveys through the lifecycle of the project to identify actual socio-economic impacts, including:

  - some construction and O&M workforce data from Vattenfall
  - contracts data from Vattenfall and from some tier 1 contractors
  - local community benefits fund information from Vattenfall
  - some tier 1 contractors' workforces' surveys
  - local community surveys
  - local media surveys

The research used a hierarchy of impact areas, from Scotland (Figure 1a) to Aberdeenshire/Aberdeen (Figure 1b), to local Community Council (Figure 1c) as set out

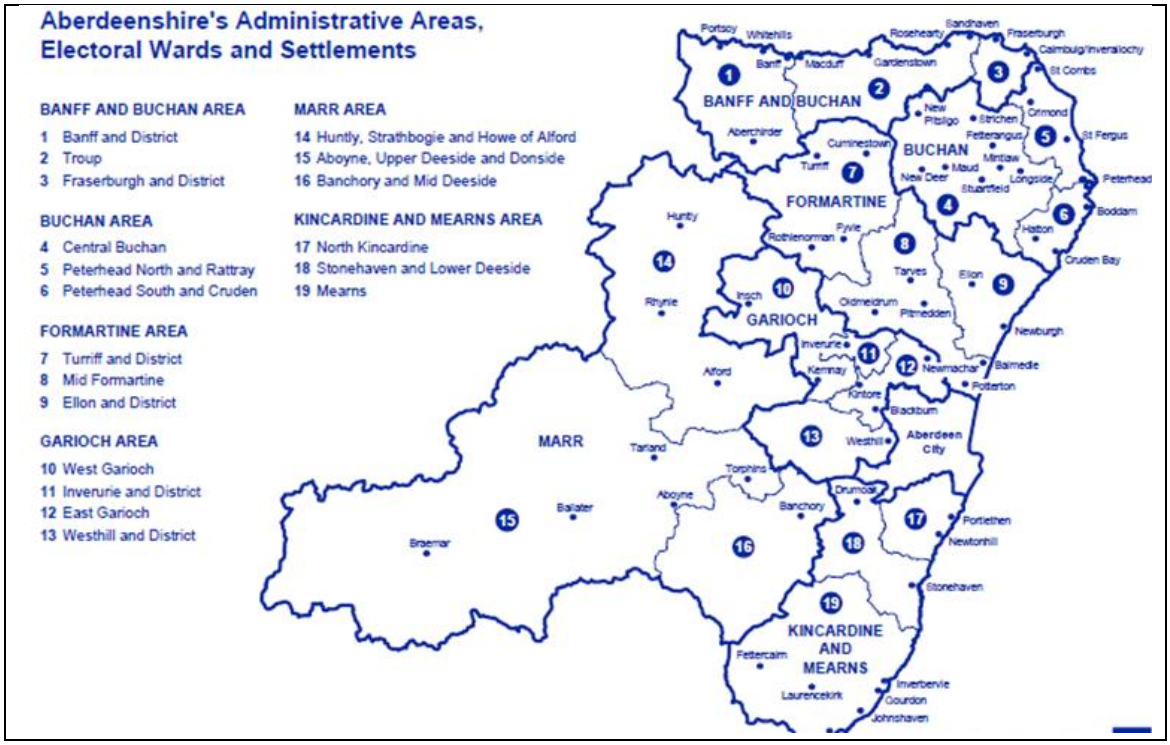
below. The particular focus has been on identifying local impacts; local was taken as including Aberdeen City and Aberdeenshire. This was identified as the Inner Study Area in the Environmental Statement for the project. Scotland, including the Inner Study area, was the Wider Study Area.

Figure 1a: Scotland study area



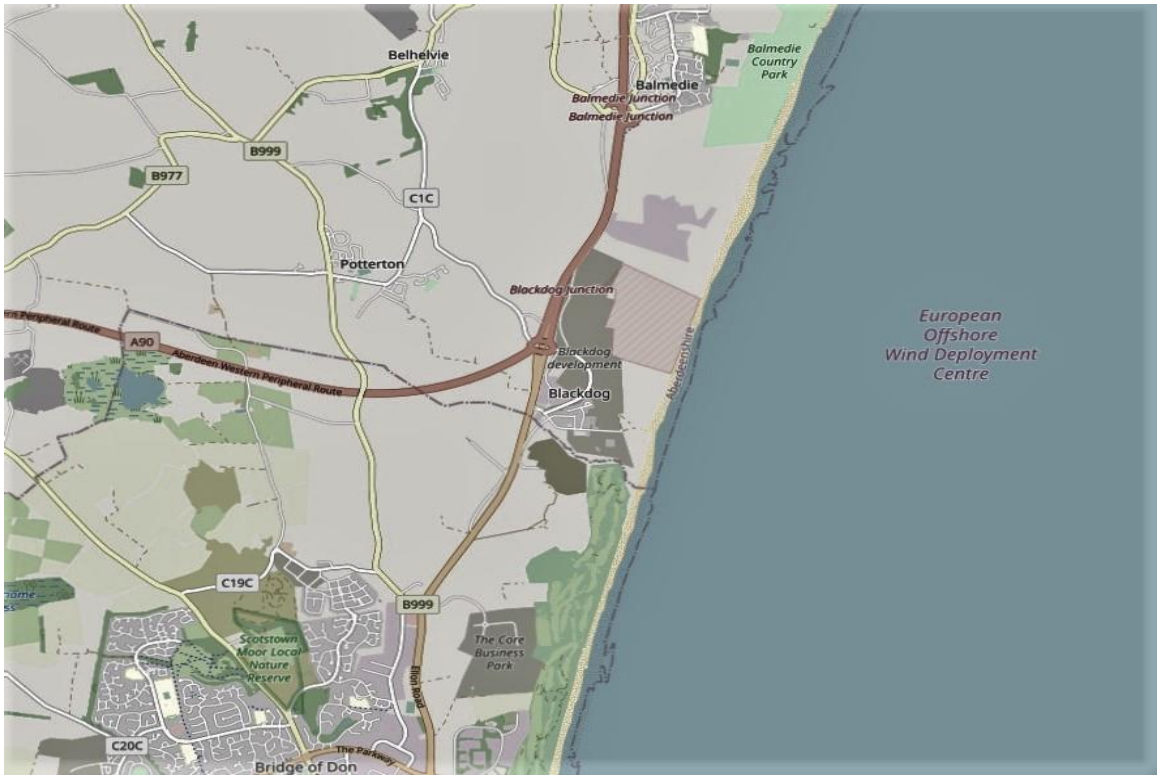
Source: Scottish Government – Scottish Executive Geographic Information Service

Figure 1b: Aberdeenshire and Aberdeen study areas



Source: Aberdeenshire Council

Figure 1c: Local study area – especially Blackdog



Source: OpenStreetMap

1.3 Data issues

The key data challenge has been on accessing, and disaggregating, employment and contract spend data for the construction stage of the Aberdeen project. This involves a working relationship with the tier 1 contractors, via Vattenfall. The position on data availability evolved as:

Good information on: Vattenfall all contracts spending; onshore tier 1 contractor contracts data, and sub-station workforce survey; community responses to proposed Community Benefits Fund; various community surveys; and press coverage of the project over its lifecycle.

Useful data on: total offshore workforce characteristics for peak construction; Blackdog community, Belhelvie CC and Local Authority and other agencies views on the initiation of the project and construction stage.

Missing data on: contract and workforce details for the two key tier 1 offshore contractors.

1.4 Structure of of this report

The report is divided into several other parts, after this introduction. Part B analyses the findings gained on the actual economic impacts over the lifecycle to date of the Aberdeen OWF. It also seeks to compare the actual impacts with those forecast in the ES . The approach is largely quantitative, focusing on employment and wider economic effects. The latter include estimates of the distribution of project expenditure, GVA (Gross Value Added) and an exploration of the local and regional supply chain.

Part C concentrates on the social impacts, including on housing, local services, amenity and quality of life (QoL). It also includes analyses of various perception studies undertaken by the project and by Vattenfall (re Community Benefits Fund). The data on the social impacts is generally more qualitative in nature.

A further section, Part D, very briefly sets out the predicted socio-economic impacts, plus any actual impacts information, on two current floating OWF developments off the Aberdeenshire coast -- Hywind and Kincardine. Hywind is now in place, as is part of the Kincardine project.

A final section, Part E , draws out some conclusions on the actual socio-economic impacts of the construction and operation of the EOWDC, particularly at the local and regional level, and compares these, as far as is possible, with the predicted impacts in the ES for the project. It seeks to explain any differences. It also summarises cumulative effects of the EOWDC with adjacent projects, especially the two floating OWFs.

PART B: ECONOMIC IMPACTS

2. ES economic impact predictions

2.1 Summary of predictions

The ES (DTZ, 2011) uses Inner (Aberdeen and Aberdeenshire), Wider (Scotland), and UK study areas. The focus here is on the Inner and Wider spatial areas. The predictions are summarised in Table 2.1; the detailed tables from the assessment are included as Appendix 1. The Predictions are for c300 Inner (c750 Scotland) construction stage job years, and c660 local (c740 Scotland) Operation and Maintenance (O&M) job years. The key Inner totals are in emboldened text in the table. The ES also predicted c£16m local GVA (c£40m Scotland) for the construction stage and c£20m local (c £23m Scotland) for the O&M stage (see Table 2.1). The predictions distinguish the Direct and Indirect (supply chain) impacts, from the Induced impacts (eg retail activities by locals employed directly or indirectly on the project).

The predictions in the ES also provide assessments of significance. These are Moderate (positive) for supply chain impacts for all stages of the project, for both spatial areas, and Negligible for the impacts on tourism and recreation. The significance details from the ES are again set out in Appendix 1.

***Table 2.1**: Summary of ES workforce and GVA predictions – for Inner (Aberdeen and Aberdeenshire) and Wider (Scotland) areas*

Project stage	Direct and Indirect			Induced		
	Onshore	Offshore	Total	Onshore	Offshore	Total
Pre-development	Not assessed					
Construction (taken as two years)	*30 p/t temporary jobs for 14 months –re substation. Additional to those in ES. NB: also laying of cable to Dyce.*	248 job years for Inner area; plus another 530 for rest of Scotland.			48 induced job years, giving total for D/I/I of 296 Inner area jobs Another 207 induced, giving total of c 740 in Scotland as a whole	**c 150 Inner area offshore construction jobs pa over two-year construction period, plus c30 onshore jobs.** c 370 Scotland jobs pa over construction period **Scotland GVA of £40m, of which £16m in Inner area**
Operation and Maintenance (taken as 22 years)	Estimated 1 job pa, for onshore works.	Estimated c 25 jobs pa.	c550 over life-cycle		Another 5 pa induced for inner area	**Total of c660 job years over 22 years life of project for inner area**, and c750 job years

			£17m GVA in Inner area over project life		Another £3m induced GVA for inner area	for whole of Scotland. **Total over 22 years life for inner area of c£20m** increased to £23m for Scotland (ie extra £3m GVA)
Decommissioning (predicted 5 months)		178 jobs –all in Inner area Inner Area GVA of £5.8m			Extra 35 Inner area induced jobs Extra Induced GVA of £1m,	**Total of 213 jobs for inner area**. Extra 34 Scotland induced jobs giving 247 in total for wider area. . **Total of £6.8m for inner area**. Extra Induced GVA of £1m, giving total of £7.8 m for Scotland.

Source: adapted from DTZ (2011)

3. Actual economic impacts – pre-construction

Vattenfall prioritized engaging with the business community through membership of business and industry organisations such as the Aberdeen and Grampian Chamber of Commerce and the Scottish Council for Development and Industry. The developer also facilitated several local supply chain events with tier one contractors in 2016-17. Aberdeen City and Shire Economic Development teams, Scottish Enterprise and the Aberdeen Renewable Energy Group (AREG) supported this engagement with local businesses.

Table 3.1, as provided by Vattenfall, shows pre-construction stage contractors, with contracts taken together totalling around £3m. Several of these contracts are with local firms (e.g Donside Safety, Maersk, Archer Marketing, Pelagica Environmental Consulting etc) and several others are with other Scottish firms in Glasgow, Edinburgh and in other centres (e.g. Sgurr Energy, Babcock Marine, The Big Partnership Group etc)..

***Box 3.1** : Comparing Economic Actuals with Predictions – Pre-Construction Stage*

A comparison with predictions is not possible as there were no prections for this stage of the project. However, from contract data provided by Vattenfall, this stage does provide some local contract, and associated job, positive impacts. In addition to those mentioned in Table 3.1, there are several smaller contracts, including for local office services, catering, accommodation, media and marketing, car hire and various small consultancies. Taken together with the larger contracts in Table 3.1, they bring an important share, c30%, of the £3-3.5m total into Aberdeen, Aberdeenshire and Scotland at large (ie c£1m).

***Table 3.1**: EOWDC pre-construction contractors*

Source: Vattenfall 2016 and 2019

4. Actual economic Impacts – construction overview

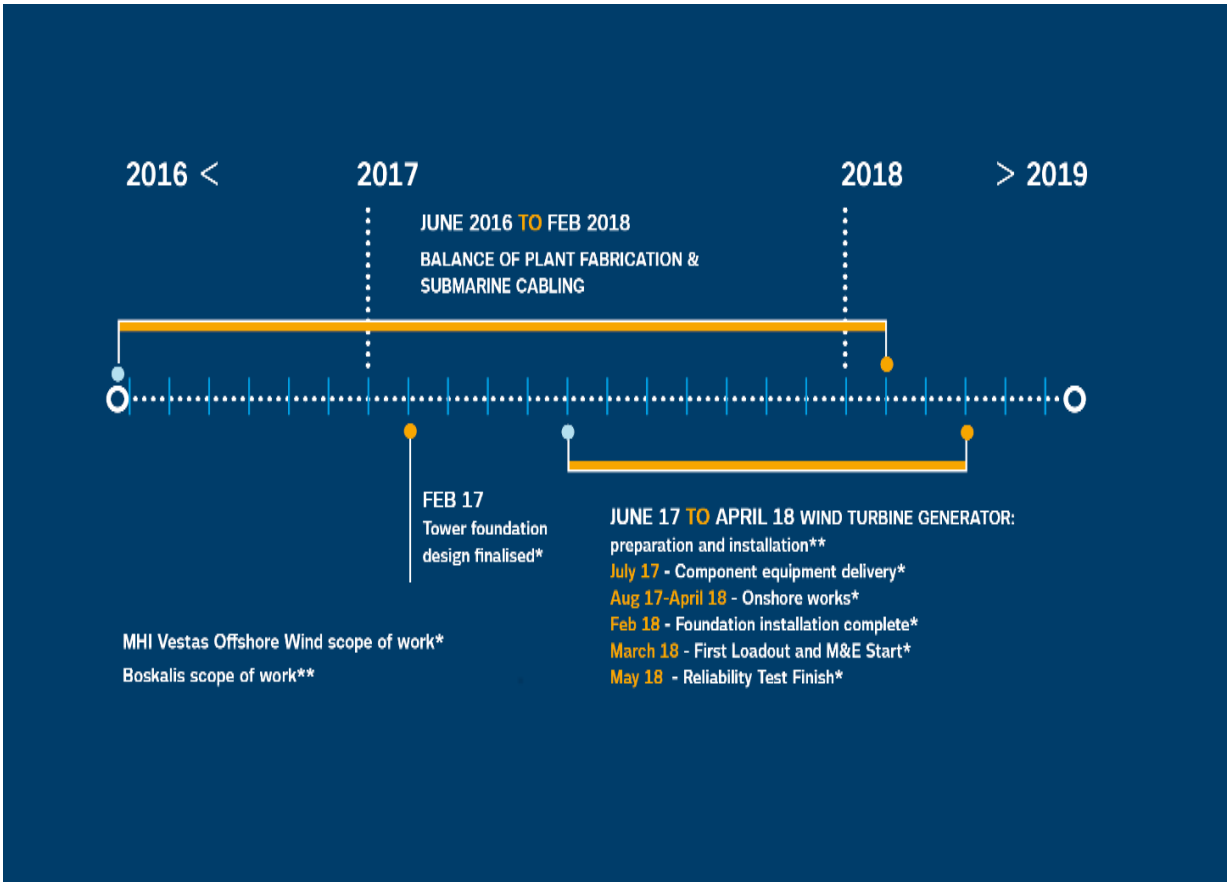
4.1 Construction programme

The construction programme involved a number of onshore and offshore elements, with key tier 1 contractors responsible for each element. Murphys undertook the onshore sub-station work, with ancillaries; the 7.6km underground cable connection from the sub-station to the 132Kv Dyce-Stonehill overhead tower line was the responsibility of Scottish and Southern Electricity Network (SSEN). The bulk of the onshore construction work was undertaken in 2017. The offshore work was largely undertaken in 2017 through to mid - 2018. Boskalis was responsible for the offshore cabling work and connections to the onshore works; MHIVestas was responsible for the installation of the eleven turbines.

***Box 4.1**: Actual and predicted total project construction expenditure*

The ES estimated total capital expenditure for the project at £260m (DTZ 2011). As at August 2019, the grand total of spend on the project was £278m. The distribution over the key construction years was £37m (2016), £100m (2017), £135m (2018) and £6m (2019) (Vattenfall contract data). There is no current overall summary of total workforce. For construction, there is a split of the workforce between onshore and offshore elements. Totals vary markedly over the construction programme. At peak, it is likely to have been of the order of 500 --- but for a short period only (see section 6 below). Detailed comparisons of actuals with predictions during the construction stage are set out at the end of sections 5 and 6.

Figure 4.1: Construction programme (as updated early 2017)



Source: Vattenfall

5. Actual economic Impacts – construction onshore

5.1 Blackdog sub-station element

5.1.1 Contracts data

Murphys, a major UK construction company, based in the West Midlands of England, undertook the sub-station work. The company very helpfully provided a breakdown of the contracts that it awarded for the project, and these are summarised in Table 5.1. They show that almost half of the expenditure was in Scotland, with the bulk of this (about one third of the total) being in Aberdeenshire.

***Table 5.1**: Distribution of sub-contracts for Blackdog sub-station and ancillaries*

Location of company	Number of contracts awarded	Total value of contracts (£m)	% of value of project sub-contracts	Types of contracts	Largest contract
Aberdeenshire	7	2.382	31	Cladding, formwork, drainage, mechanical and electrical	£400k+, for formwork and M&E
Rest of Scotland	10	1.154	15	Mainly smaller consultancy contracts, especially for labour supply	£900k for agency labour
Rest of UK	27	2.603	33	Mix of medium and small consultancy type studies	£300k+ for installation, commissioning, studies
Overseas	3	1.67	21	Transformer, steelwork and cable jointing	£1.1m for transformer from Hungary
Total	47	7.809	100		

Source: Murphys

5.2.2 Workforce Data

A survey of the socio-economic characteristics of the onsite Blackdog workforce, at the sub-station site, was carried out with a direct worker questionnaire survey in November 2017. Thirty-one workers completed the short questionnaire; five workers opted not to complete the questionnaire. The completions covered approximately 80% of the workers on site at that day. Not all the workers completed all questions, so there are some variations in total numbers across the questions. Appendix 2 provides the detailed findings. The bullet points below set out the key headline findings from the survey:

- the workforce was about 50:50 skilled and semi-skilled/unskilled, with the majority working for Murphys
- almost all were in employment prior to this contract; some were in the employment of the contractors/companies that brought them to the site
- at least 60% of the workforce came locally from within Aberdeenshire; most of these lived in Aberdeen or near Aberdeen
- of the remaining in-migrants, about 80% came from Scotland, but others came from as far afield as Manchester, Belfast and Australia
- about 30% of the workforce moved into local accommodation, predominantly B&B/guest houses, for the purpose of working on the project;
- most workers travelled less than 30 minutes to site, although some made a daily commute of over 2.5 hours from as far afield as Glasgow; most workers travelled to the site by car

- a range of local services were used by at least half of the workforce, with local garages/petrol staions and supermarkets being the most popular
- in terms of local expenditure, food and fuel/fares are the items with the highest expenditure, with about 50% of respondents spending above £50 weekly on food and similar numbers spending similar amounts on fuel
- the aggregated weekly expenditure in Scotland from the workforce is estimated at over £4000

5.2 Blackdog to Dyce cable connection element

Data was not available from SSEN. It is estimated that the contract and workforce numbers were somewhat less than those for the work on the sub-station but likely to have a similar local (Aberdeen and Aberdeenshire) and Scotland proportionate content.

Box 5.1: *Comparing Economic Actuals with Predictions – On-shore Construction Stage*

Predictions were sparse for onshore construction -- 30 p/t temporary jobs for 14 months work on substation and cable landfall. The main onshore contractor, Murphy, provided useful data which, with estimates for SSEN (cable to Dyce), indicate about 60 employees in total over a period of about 12-18 months. Our survey work on the sub-station employees indicate c60% of this workforce came from the Inner Study Area, and most of the remaining 40% from the rest of Scotland. The source percentage figures for the Dyce cable connector work are likely to be similar. Local multiplier impacts may have increased the total employment impact to c90 for the period involved. This is significant locally, and substantially higher than predictions. Detailed contract and sub-contract data from Murphys indicates about 33% of contract spend in the Inner Study Area, and another 15% in the rest of Scotland. Assuming similar figures for SSEN, this would give an Aberdeen and Aberdeenshire spend of c£4m; again local multiplier impacts may have increased this to about £6m. Figures for Scotland as a whole are c£6m with multiplier increase to c£9m.

6. Actual economic impacts – construction offshore

6.1 Contracts data

It is not easy to pin-down the distribution of offshore construction stage contracts from the Aberdeen project, without more information from Boskalis and MHI Vestas. A representative of MHIVestas noted that they *'were not in a position to disclose contract value to yourselves unfortunately, given our confidentiality commitments to Vattenfall. However I can clarify that a percentage of the total contract sum would have been allocated to businesses in the Aberdeenshire area, such as cleaning, harbour logistics, vehicle hire, accommodation for personnel in local hotels etc'*. An assessment from both Vattenfall themselves, and from our own analysis of the project's contract data, suggests as a minimum the following:

- the main offshore contacts, each of about £100m are with the overseas companies Boskalis Offshore Ltd, and MHIVestas Offshore Wind;
- about £16m has been spent on UK Tier 2 and Tier 3 sub-contracts, plus £27m on a turbine foundations contract, and £7m on subsea cable supply – giving a current UK running total of £50m
- about £3.4m of the £16m above is estimated to have been spent with over 100 Scottish suppliers;

- about £1.6m of the £3.4m above is estimated to have been spent with over 65 suppliers from Aberdeen and Aberdeenshire; and
- the percentage share of the offshore construction work is estimated at about 25% for the UK as a whole. Within this figure, the Scottish percentage is about 2% of the total offshore project expenditure, and Aberdeen and Aberdeenshire about 1% of the total expenditure. All figures may be increased by about 50% to include multiplier effects, giving total UK expenditure of c£78m, Scotland c£5.1m and Aberdeen and Aberdeenshire of c£2.4m

The local Aberdeen/Aberdeenshire area expenditure includes many small service based contracts. Only three contracts were for over £200k; over 40 were for contracts of less than £10k. The other Scottish contracts were also quite small, with the exception of two large contracts for radar mitigation and for legal services.

6.2 Workforce data

We do not have detailed workforce data from the tier 1 contactors, but we do have the following very useful generic data from the Vattenfall marine coordinators' team for the Aberdeen project. This relates primarily to peak construction in Spring 2018. At peak, there were around 500 personnel offshore on the vessels Pacific Orca, Olympic Delta, EDT Jane, Aegir, Asian Hercules III, Seiont A, and Isla B. In total 33 vessels were involved in the whole project. The average offshore construction workforce over the full construction period was of the order of 200.

The personnel on the vessels included both installation staff and support staff (accommodation, catering etc). The mix of installation staff to support staff was c70:30. Most workers were on relatively short-term contracts for this project, averaging 6 months. However, their parent companies may have contracted many of them for much longer-term employment, as they moved from project to project. A very broad mix of nationalities was involved in the project, including personnel from Denmark, the Netherlands, Sweden, Belgium, Germany, Spain, Poland, Czech Republic, Cyprus, England, Scotland, Wales, Ireland, Indonesia, and Australia. There were vastly more other Europeans (80%) compared with British (10%) and other nationalities (10%). Dutch personnel constituted about 50% of the workforce at peak construction. Of the small Scottish contingent (c10 people), half came from Aberdeenshire and the rest from further afield. MHI Vestas noted that due to the small nature of the project (11 WTGs) and the resultant short construction period, a large percentage of the overall personnel working on the project were sourced externally to the local area (i.e. due to personnel already being employed, experienced, trained and skilled, and that existing production facilities are already established outside of Scotland).

The typical work pattern varied according to the project stage. Much of the project involved 24 hours operation at sea, but later on this shifted to a 12 hours day at sea, followed by a return to port, although some larger vessels stayed outside the port, as they were too big to enter Aberdeen harbour. Whilst most personnel were accommodated on board, approximately 100 of the 500-peak workforce lived onshore. The company provided flats and houses within Aberdeen City Centre for the duration.

Box 6.1: *Comparing Economic Actuals with Predictions – Off-shore Construction Stage*

Predictions were for c150 Inner Area (Aberdeen and Aberdeenshire) jobs pa over a two year period. As noted above, for this relatively small project, the main contractors sourced a large percentage of the overall personnel working on the main offshore element external to the local area. It is not possible to be detailed on the actual local construction employment, but even allowing for a 50% indirect and induced multiplier impact, it is likely to be well below the predictions, at probably no more than 50-60 jobs pa, and as such similar to the actual onshore jobs impact.
Other ES predictions were in terms of GVA, which is an economic metric that quantifies the value added to good and services produced. This is usually substantially lower than the expenditure approach that determines the expenditure on goods and services in the economy under review (eg. Inner Area). The prediction was for c£16m GVA in total in the inner area. The actual expenditure is estimated at £2.4m from details from both Vattenfall themselves, and from our own analysis of the project contract data. This is a big difference, and even bigger when adjusted to GVA. However, it does exclude any contracts associated with the two main contractors, which account for two-thirds of all offshore construction spend. If the local expenditure from those was pro-rata to that calculated above, there would be an increase to c£7m. However, compared to onshore expenditure, this remains a major area of leakage of economic impact from the local, and from the Scottish economy.

7. Actual economic impacts – O&M

Officially, the O&M stage started in August 2018, when the Service and Availability Agreement commenced between Vattenfall and MHI Vestas UK. For the first five years of operational phase of the wind farm, the servicing will be shared between Vattenfall and MHIVestas, after which Vattenfall has the option to consider taking full control. O&M staffing is already in place in Aberdeen with about 10 Vattenfall employees, and about 5 MHI Vestas employees. The Vattenfall staff include a mix of management/admin staff, technicians and service staff. They are predominantly locally/Aberdeen recruited. The MHI Vestas staff include a team leader plus technicians, again largely locally/Aberdeen recruited. Local contracts to support O&M operations include Aberdeen Harbour Board, for quayside space/facilities and Regent Centre space; crew transfer vessel; onshore balance of plant; and offshore balance of plant inspection and maintenance. The latter balance of plant contracts were agreed in July 2019.

The offshore balance of plant contract has gone to the Aberdeen-based offshore wind services firm, Rigmar, to support maintenance on the balance of plant – to inspect and maintain subsea structures and cables as well as foundations, turbine transition pieces, and boat landings. This is Ringmar's first win as a main contractor in the offshore wind industry, having built up experience as a sub-contractor. It is stated that it will secure work for 20 of its technicians.

The head of the Vattenfall EOWDC, is clear that local businesses will continue to benefit from the wind farm. He said: *"Now that EOWDC is up and running, Vattenfall is spending two to three million pounds every year in the local economy. In addition, with a local team we are well placed to build on relationships with the north east's supply chain. So I'm delighted that Rigmar, a highly-qualified company headquartered in Aberdeen, will join us in ensuring the EOWDC continues to generate fossil free electricity."*

Andy Martin, Business Development Lead for ORE Catapult, said*: "Rigmar is one of the first companies to benefit from participating in ORE Catapult's Fit 4 Offshore Renewables business improvement programme. The programme is a unique service to help the UK supply chain get*

ready to bid for work in the offshore renewable energy sector and, in the case of Rigmar, has proved incredibly successful in enabling them to win this major contract with one of the UK's most innovative wind farms." Vattenfall Press Release (160719)

A firm registered in Barrow-in-Furness won the onshore balance of plant inspection & maintenance contract. It is of the order of, initially c£175k for a duration of 3 years, plus two optional one-year extensions. The work scope is for the planned inspection and maintenance of the onshore substation, completed on a monthly basis with approximately two technicians per visit. The contract also includes the provision for additional services through unplanned maintenance or spare parts, upon request.

Box 7.1: *Comparing Economic Actuals with Predictions – O&M Stage*

The predictions were for a total of c660 job years over the 22 years life of project for the inner area, and for a total GVA of c£20m for the same area. The overall contract value of the O&M stage, largely using locally based companies, may be of the order of at least £3m pa, and indirect and induced multiplier impact of up to another £3m, giving a total of c£6m – totaling undiscounted total expenditure of over £100m over the project life. Although adjusting to compare with the GVA prediction is not straightforward, it is likely that the actual O&M economic impact is well above that predicted.

A high proportion of the O&M staff are from Aberdeen and Aberdeenshire. With long-term contracts over the 20 years, there may be higher indirect and induced multiplier impacts, increasing total job impacts to c40-50pa, giving a significant 800-1000 Full Time Equivalents (FTEs) over the life of the project, and again well above the predicted O&M impacts in the ES.

PART C: SOCIAL IMPACTS

8. Social impacts – ES predictions

The ES for the EOWDC includes two reports: a Baseline Report, and an EIA Technical Report (DTZ 2011). There is very little coverage of social impact issues in either report.

The Baseline Report does include a section on Population, showing that the population growth for both Aberdeen and Aberdeenshire is above the Scottish average, especially for Aberdeenshire. Similarly, also in comparison with Scotland as a whole, skill levels are higher; unemployment levels are lower. There is also some coverage of the area as a location for tourism, and for local coastal recreation activities, including recreational boating and sailing, surfing and sea angling.

The EIA Technical Report focuses largely on economic impacts but does note the potential of job creation to reduce unemployment in the area, and to offset partially the anticipated contraction in employment in other sectors such as oil and gas and manufacturing. The ES assessed the impacts on tourism, for example from the visual effects on the landscape and seascape potentially to deter tourist visits, and the effects on local coastal recreation activities, as of negligible significance. At the local level, the report notes the importance of mitigating any noise and pollution impacts on the Blackdog community associated with the onshore site works, including local traffic impacts

9. Actual social Impacts – pre-construction

9.1 Engagement strategy

Since the Final Investment Decision (FID) in July 2016, Vattenfall implemented a proactive, two way community engagement strategy, involving an extensive engagement with local residents and key local stakeholders, providing briefings and attending meetings and events to inform and consult on the construction of the EOWDC. On a monthly basis, project representatives, in particular the project Local Community Liaison Officer, attended the Belhelvie Community Council meeting, and met with the chair of the Blackdog Residents Association to provide an update on the project and get their input on current developments. The project also made use of local community magazines, community newsletters, drop-in sessions and the Vattenfall website as a medium to communicate with local residents and stakeholders.

A key component of the engagement strategy has been/is educating and raising awareness of the renewable industry and the technology and innovations associated with the AOWF project. This has involved working collaboratively with the Aberdeen Science Centre to facilitate education outreach sessions, workshops and events to deliver relevant information in an interactive, accessible and engaging way. In addition to being involved in a series of Science, Technology, Engineering and Mathematics (STEM) events and project presentations throughout Scotland, the EOWDC also supported established community events such as Techfest, the May festival, Energetica Festival and Wild About Aden Community Day. Wood RecyclAbility provides another example. Wood RecyclAbility is an organisation based in

Pitmedden Aberdeenshire that offers adults with a wide range of abilities the chance to experience a real workplace setting. Vattenfall collaborated with them to make a human height wooden turbine for Vattenfall community events. They also made the mini-turbines used for Vattenfall monthly HSSE awards. There have been other engagement events, including the 2018 Aberdeen Library Exhibition.

9.2 Associated community funding support

About £85,000 in funding has been provided for a variety of local causes including the Aberdeen Science Centre, Aberdeen Football Club, Belhelvie Girl Guides, Aberdeen and Grampian Chamber of Commerce, Robert Gordon University and various other local groups. Details of the funding to July 2019 are set out in Table 9.1. This funding is separate from the funding subsequently provided under the Community Benefits Fund (see s 11.1).

***Table 9.1**: Community Financial Investments, up to July 2019*

Community support initiative	**Associated funding**
Partnership with Aberdeen Science Centre To deliver interactive, engaging educational sessions and events about the wind industry and the innovation and technology deployed at the EOWDC. This partnership contributes to the education of future beneficiaries, ambassadors and potential employees of renewable energy. Teachers from Aberdeen City and Shire can also attend CPD sessions to help to explore the science behind offshore wind. This partnership is from January 2017-September 2018. Renewed.	£10,000 (renewed with a further £10,000)
Support of Aberdeen Football Club Community Trust and Aberdeen Football Club Youth Team Vattenfall, Aberdeen Football Club (AFC) and Aberdeen Football Club Community Trust (AFCCT) established a partnership to jointly support, promote and provide opportunities for male and female youth football and leadership development in the North East. Vattenfall have provided financial support of £5,000 to the U18 male youth team which will fund their participation for the first time in the Youth World Cup in Gothenburg. The remaining £5,000 has funded the development of a grass roots girls youth league involving 60 teams in Aberdeen City and Shire. This partnership is from February 2017-March 2018. Renewed.	£10,000 (renewed with a further £10,000)
Donation to Blackdog Residents Association The Blackdog Residents Association requested financial support to improve the access and drainage in their community park. The Residents Association raised £500 which Vattenfall supplemented by donating a further £2000 to enable them to apply for a landfill tax funding amount of £25,000. The residents are in the process of applying for £25,000 towards the community park renovations. In addition to this Vattenfall donated £500 towards co- hosting a summer community-day event with the Blackdog Residents.	£2,500
Membership of Aberdeen& Grampian Chamber of Commerce	£15,500

Support to Robert Gordon University (RGU) For work experience, with RGU intern to support Vattenfall with community engagement and educational outreach placement throughout the 2017 summer months. RGU Partnership for innovation exhibition- £10,000. Also potential funding of 2 x Doctoral or Masters Students.	£10,000 plus other not specified
Donation to Belhelvie Girl Guides: the project donated £800 and £1000 for the 1st Belhelvie Girl Guides support with the delivery of Vattenfall newsletters to Blackdog and Balmedie.	£1800
To *Belhelvie Banter,* for quarterly project features in this community magazine (£620 +300).	£920
To *Wood Recyclability* - which offers adults with a wide range of abilities the chance to experience a real workplace setting.	£1,000
To *Wild about Aden* community event.	£200
To *Theatre Modo* – which uses circus to engage young people across Aberdeenshire and to help them to change their lives for the better. It delivers one-off circus skills workshops, long-term programmes and large-scale community extravaganzas.	£500
To *Cyrienians and Iceberg Printing* - supporting people excluded from family, home, work or community on their life journey.	£500
Donations to Harbour Board Foundations.	£500
East Grampian Coastal Partnership- towards project officer.	£1500
Supporting Balmedie and Belhelvie Library	£400
Sandy Bothy donation.	£100
Commercial artist.	£7,000
Blackdog Gala	£1,000
Community Element of Inauguration Event	£2,000
TOTAL	*£85420*

Source: Vattenfall

9.3 Local perceptions of pre-construction stage, and early onshore construction

Research focus group meetings in 2017 with members of Belhelvie Community Council, and members of the Blackdog Residents Association, raised a number of issues about the onshore pre-construction stage of the project. Details are set out in Box 9.1. They include recognition of Vattenfall commitment to community engagement, some issues about likely construction traffic and noise, plus awareness that some of the main local benefits are more likely in the

O&M stage. The project was also seen as another example of major developments cumulatively having an impact on a small area; the construction of the Aberdeen Western Peripheral Road was a particularly significant current construction project adjacent to Blackdog.

***Box 9.1**: Local community views expressed pre-construction/early sub-station construction (2017)*

1. Role of community in project to date

The community had been involved in the project from the planning stage, with local councillors supporting the initial decision by the local planning authorities to refuse the application. However, once Scottish Ministers approved the application, the community sought to 'get on board' and 'embrace' the project. It was acknowledged that Vattenfall had engaged with the community more than would have been expected.

2. Local issues raised at planning stage

There had been some assumptions in the community on the number, size and location of the turbines that led to a 'fair amount of resistance' at the planning stage. Whilst there were local residents who were 'very vocal' in objecting to the development, it was observed that there were 'larger amounts who generally didn't mind'. The role of the media in potentially exaggerating concerns was also noted as 'the press seem to hook up [on those who object]; they are not interested in people who want to go along with things'.

3. Local economic effects to date

To isolate localised economic benefits from the project was seen as difficult 'there are no businesses there to have an economic impact with…it was a hamlet'. The community acknowledged that there were attempts to try to source materials locally for the sub-station but otherwise 'everything else is being done in Europe, not a lot's being done in Scotland and the local community don't see gaining anything from it'.

4. Local social effects to date

The area suffers from a historic legacy of landfill over 50 years and the community felt 'blighted'. The area had a number of different developments either in progress or planned that are unrelated to the windfarm (including the Aberdeen Western Peripheral Road, construction of 600 homes, construction of a multiplex, industrial estate and gypsy travellers site) which were referred to as being 'a double edged sword' for the community.
There has been some impact on community cohesion from the construction phase with some community members continuing to oppose strongly the development and to monitor construction activities, especially traffic. However, the Energetica Plan* (and the 'high profile' Vattenfall project) along with the publicity raised by the Trump golf course were seen as positive by some in bringing attention to the community.

5. Local community benefits

Some respondents noted that although the physical impacts on the community from this project occur at the construction stage, the main financial community benefits probably only come once the project is operational. Perceptions on potential local benefits included whether the community would receive cheaper electricity (question asked at a public meeting). There were also some expressions of the community having to 'arm twist' to obtain funding for initiatives during construction.

6. Other issues/effects

There could be opportunities when landscaping the substation site to build in benefits for the community (e.g. community orchard or welfare project). There were some potential concerns over the level of noise that the substation might generate once operational, as information was lacking on likely decibel levels.

* The Energetica plan, managed by Scottish Enterprise and the Aberdeen/shire local authorities is a global showcase for energy technology development and energy efficiency. It aims to create an exemplar and innovative, sustainable development corridor. Operating within a stunning natural and built coastal environment, Energetica seeks to integrate two key components - sustainable economic growth and quality of life.

Box 9.1: *Comparing Social Actuals with Predictions -- Pre Construction stage*

As noted in s8, there is very little coverage of social impact issues in the various ES reports. As such, any comparison can only be with established good practice elsewhere, as covered in other Technical Reports for this research programme. See in particular Technical Report 1- Literature Review, Technical Report 2 – Review of ESs for UK Offshore Wind Farms, and the Overriding Guidance Report (All Oxford Brookes University/Vattenfall 2020).

For the pre-construction stage, there is actual evidence of much good practice in the Vattenfall engagement strategy, well managed by the project's Local Community Liaison Officer. There was extensive engagement with local residents and key local stakeholders, and a programme of community funding support, totaling at least £85,000 for a range of large and small projects. Although there were some local concerns from the Blackdog residents, there was recognition of Vattenfall's commitment to community engagement, plus awareness that some of the main local benefits were more likely in the O&M stage.

10. Actual social impacts – construction stage

Social impacts of construction include a mix of quantitative and qualitative findings. The former, including impacts on the housing market, local services, quality of life and community cohesion, are difficult to disentangle from the impacts of other community activities, especially when they are quite small in total, and somewhat diffuse. However, one specific location, the community of Blackdog, has encountered some of the immediate impacts of the onshore construction, in particular of the construction of the substation. Wider, more perceptual findings, including views as portrayed in the local press, and some local surveys by the team, are set out in section 10.2.

10.1 Social Impacts of the construction stage on Blackdog

Focus group discussions with the community, at the time of the construction of the sub-station, raised a number of points, as set out in Box 9.1. Transport was a particular issue for some local residents during the onshore construction works. This had some impact on community cohesion at the time with some community members continuing to oppose strongly the development and to monitor construction activities (especially traffic).

10.2 Wider perception impacts of the OWF construction

A number of sources were used to gain some views on local perceptions of the social impacts of the construction stage. These included local surveys of community members, and meetings with representatives of key community groups. There was also an analysis of impacts as portrayed in the local press.

10.2.1 Survey at Vattenfall Renewable Energy Exhibition, held in Aberdeen Library in February 2018

A brief survey by the project team of visitors to the Vattenfall Renewable Energy Exhibition, held in Aberdeen Library in February 2018, provided a general overview of local views on renewable energy, and particularly on offshore wind. This was at a time when the main offshore construction of the Aberdeen OWF was becoming more evident. The survey included just 25 people, and its detailed relevance is limited – but it does provide a few general pointers to local opinion. A spreadsheet on the specific findings is included as Appendix 3.

The survey respondents covered a wide age range; there were more female respondents than male. Most respondents were well aware of the different types of renewable energy, especially onshore wind, offshore wind and solar; but there was less familiarity with tidal and wave power. With regard to offshore wind, the main benefits were seen as mitigating climate change and generating clean energy; creating local jobs and providing education and training opportunities were mentioned by just less than 50% of respondents. The only possible disbenefits, mentioned by about 40% of respondents, included visual impacts and noise from turbines. A range of interesting comments were provided on OWFs (especially on the Aberdeen project). Positive comments included, for example: *sense of pride-demonstrating Scotland's commitment to renewables; I love the look of windfarms, they are beautiful; clean energy is beneficial to everyone; benefits for jobs and the environment; can take over when oil runs out.* There were far fewer negative comments, but some examples included: *possible disruption to wildlife/sealife; disruptive onshore infrastructure; visual disbenefits.*

Table 10.1*: Summary of some findings from survey at Vattenfall Renewable Energy Exhibition, held in Aberdeen Library in February 2018*

% respondents familiar with various types of renewable energy				
Onshore wind	*Offshore wind*	*Solar*	*Tidal*	*Wave*
80	96	92	60	52
% respondent identification of following impact benefits of OWF				
Mitigating climate change	*Generating clean energy*	*Creating local jobs*	*Providing education and training opportunities*	
84	84	48	48	
% respondent identification of following impact disbenefits of OWF				
Visual impacts	*Traffic*	*Noise from turbines*	*Light flicker from moving blades*	*Onshore cable route disruption*
40	4	36	4	0

10.2.2 Views of construction impacts as portrayed in the local press

One of our research activities examined and analysed the public perception of the project and the narratives that have formed around press reports, newspaper articles, social media comments, and the public consultation for the project, starting with the pre-approval public consultations, through the construction stage, to the current O&M stage of the project. Each

stage -- pre-application public consultations, construction, and O&M -- was analysed individually, and then as a collective consideration of the change in public perception through the stages over a timeline. This is reported using appropriate graphs, charts, and illustrations. Overall, this provides an interesting window on key themes on the project in the public media over the project lifetime to date. The full report is included as Appendix 4. The following illustrations and commentary provide a brief summary only. Figure 10.1 provides a listing of positive and negative media themes across the project timeline. Figures 10.2 and 10.3 attempt to assess the shifts in positive and negative themes across the project life to date.

Figure 10.1: A summary of positive and negative media coverage across the project timeline

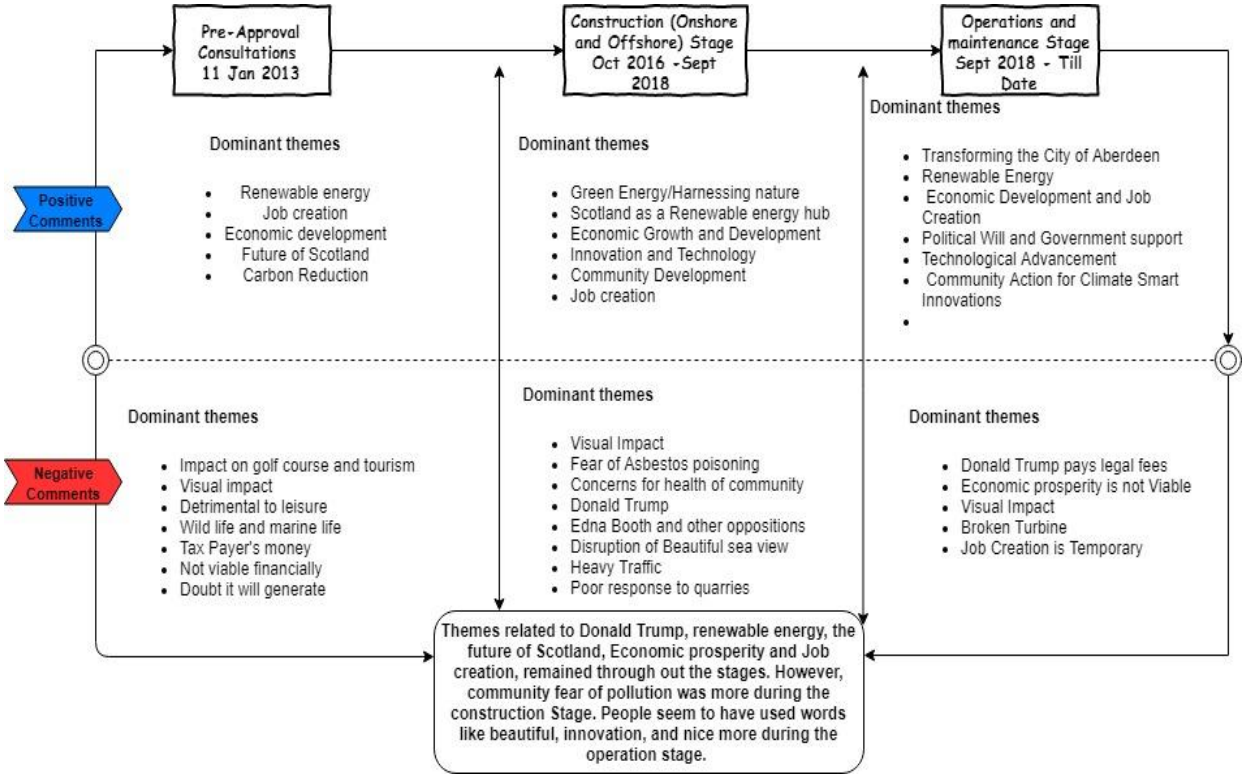
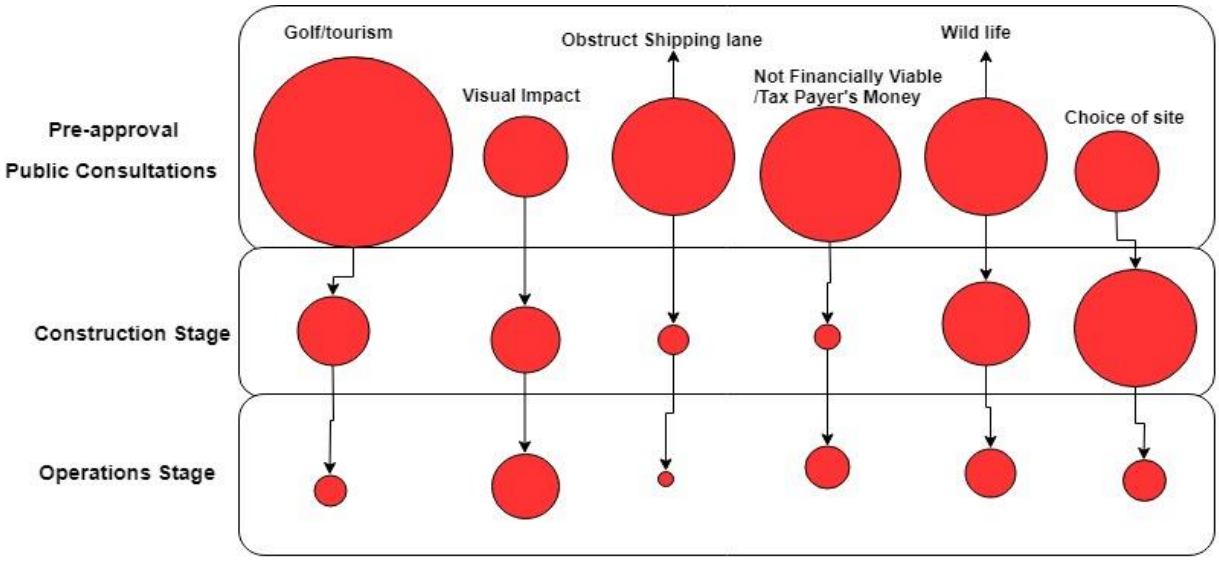
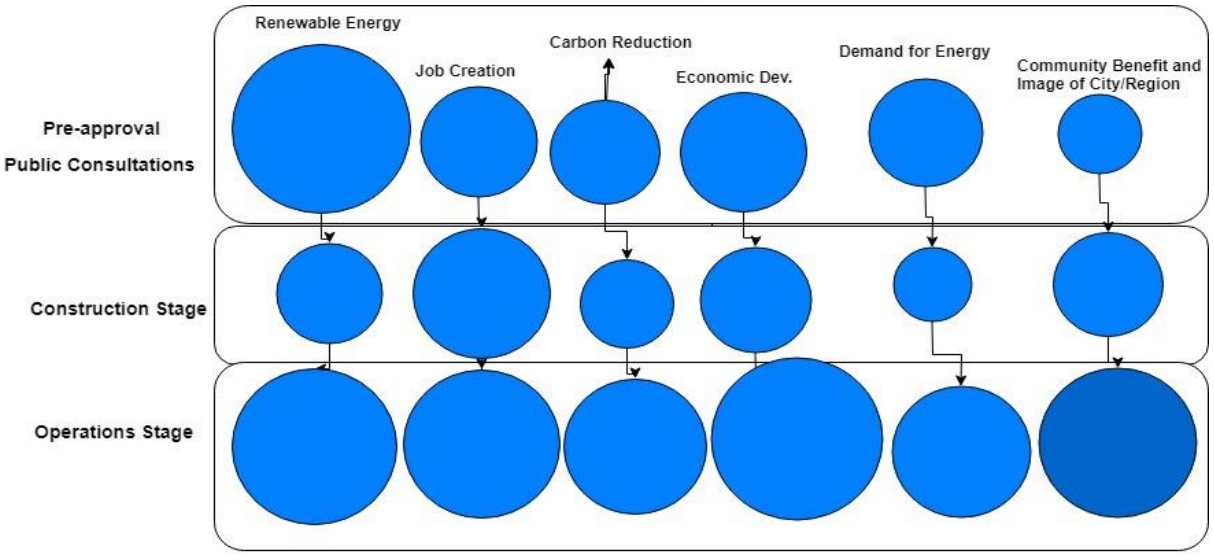


***Figure 10.2**: Showing the spread and degree of dominance of negative themes across all stages of the project (shape sizes indicate the frequency of mention of the issues identified).*



A graphic representation of how the major negative themes in public perception dominated the different stages of the project

***Figure 10.3:** Showing the spread and degree of dominance of positive themes across all stages of the project (shape sizes indicate the frequency of mention of the issues identified).*



A graphic representation of how the major positives themes in public perception dominated the different stages of the project

From the media investigation there appear to be some *key trigger factors* that have contributed to public conversations and perspectives on the Aberdeen windfarm project.

- For example, if Donald Trump had not objected because of the proximity of his golf estate to the project, perhaps the number of those who submitted an objection would have been much reduced, and the international coverage in the print and electronic media would have been much less. Conversely, the influence of Trump may have triggered support for the project in some quarters, as there were reports across all stages that suggest some people were offended by his perceived meddling in Scottish business.
- Another trigger factor is identified as the image of the city of Aberdeen as the oil and gas capital of Europe and the recent slowdown following the drop in oil prices and loss of jobs in the city and region. Many saw the windfarm industry as an enabler to job creation. In addition, the existing oil and gas skills and experiences were reported to be a ready source of skilled jobs for the windfarm project. The strategic development goal of the region to reposition Aberdeen as a global renewable energy hub also contributed to the public narrative about the project, especially for those who supported it.
- The global drive for more sustainable energy sources through the exploration and development of renewable energy is another factor that shaped public opinion and perception on the EOWDC. Several submissions were made through all the stages to support the project because it favoured reduced carbon emission.
- A final trigger is the need to create jobs; the local councils and the Scottish government argued that the project was an opportunity to provide jobs. Also, the induced and indirect jobs and development that the project will create across the supply value chain and around the local ports also dominated several announcements and reports that may have influenced public and community perceptions.

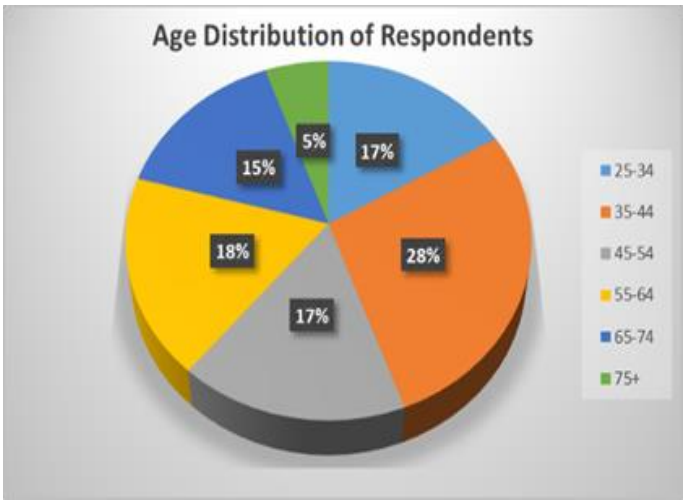
The analysis of the public perception through the different media used in this research also revealed some social issues that were related to the project. Firstly is the earlier identified fear of impact on health of the Blackdog community due to concerns about exposure to asbestos and from the movement of trucks to the onshore sub-station (a local campaigner may have been a more effective participant than Donald Trump, especially on Blackdog construction traffic issues). Secondly, there is the assumption that the EOWDC will create jobs to help reduce the unemployment caused by the downturn in the oil industry in Aberdeen. Finally, there is the community benefit to meet some need in the community, which appears to be a significant factor pleasing some of the campaigners. These social issues also link to socio-economic issues of wellbeing, jobs, community infrastructure, and image of the city.

In summary, the negative perceptions towards the project were more dominant at the pre-approval consultations stage, and were much less so in the construction and O&M stages. Conversely, the positive perceptions remained strong throughout the life cycle. The overall outlook, as illustrated in Figures 10.2 and 10.3, shows a clear balance of positive comments. The sentiments identified across all stages relate mostly to the involvement of Donald Trump in objecting to the project, the need for Aberdeen to regain lost ground as a hub for energy-related technical innovation, employment opportunities, and finally the importance of supporting the transition to low carbon renewable sustainable energy sources.

10.2.3 Views of construction impacts as identified by various community groups

Views of the community on impacts experienced during the construction phase were collected through a three-phase survey. Those surveyed included attendees of the launch of the community benefits fund and members of community groups in the local area; 72 responses were received. The questionaire used in the survey is included in Appendix 3. The age range of respondents indicate a reasonable distribution of participants in terms of age (Figure 10.4) although the gender balance was somewhat skewed with 61% of respondents identifying as male.

Figure 10.4: *Age distribution of respondents*



A number of questions asked whether they considered they had been suitably informed of the potential impacts during the construction phase and for their experience on a number of potential issues during construction. In general, almost an equal number of respondents felt they had been suitably informed on the progress of the project as those who considered they had not (Figure 10.5). However, concerning information on likely disruption during construction, the majority (40%) disagreed or strongly disagreed with the statement that they had received sufficient information (Figure 10.6).

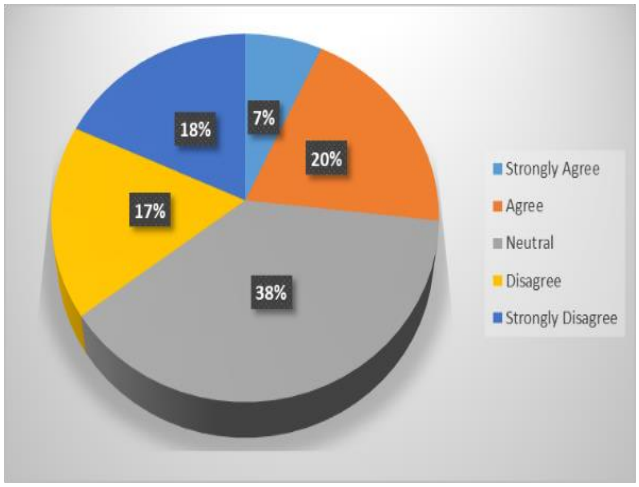


Figure 10.5: *Responses to statement: I received sufficient information on the progress of the project during the construction phase*

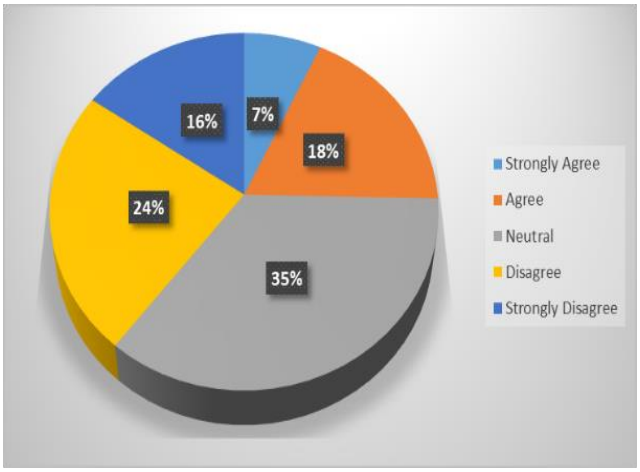


Figure 10.6: *Responses to statement: I received sufficient information on likely disruptions that might affect me during construction e.g. traffic*

Respondents were asked to what extent they had experienced a range of potential impacts during the construction phase. For all the potential impacts, the majority response was either not experienced or as expected (Table 10.2). It is interesting to note that around 20% of respondents rated their experience from visual impacts during construction of the onshore component and project bringing change to local community as less than expected. Respondents were also invited to provide any 'open' comments on experience of the windfarm. Twenty-four open responses were received (representing 33% of respondents). The most comments (ten out of 24) related to public engagement, e.g. 'I did not really know it was going to be happening', 'very little public engagement', yet others also commented on the 'benefit' of this 'we did not thankfully have any undue mail or email' and the advantage of informative websites.

Table 10.2*: Summary of responses on experience of potential impacts during construction*

Potential impact	*Not experienced*	*Less than expected*	*More than expected*	*As expected*
Traffic	60%	16%	7%	17%
Visual impacts during construction of onshore component	21%	22%	6%	51%
Project bringing benefits to local economy	40%	13%	1%	46%
Project providing local employment opportunities	47%	12%	4%	37%
Project bringing change to local community	39%	21%	6%	34%
Visual impacts during installation of the turbines	27%	7%	11%	55%
Project providing local education opportunities	41%	15%	10%	34%
Project bringing social benefits	44%	15%	7%	34%

***Box 10.1:** Comparing Social Actuals with Predictions -- Construction stage*

The same caveat applies to the comparison between actuals and predictions as noted in Box 9.1. For such a small offshore wind farm project, with little direct local employment, any impacts of the construction stage on the local housing market, local services, quality of life and community cohesion, are difficult to disentangle from the impacts of other community activities, especially when they are quite small in total, and somewhat diffuse. The only community where the impacts were more concentrated was that of Blackdog, and even here, impacts were limited, as noted in Box 9.1 and in survey responses.

Surveys of a wider Aberdeen/Shire community indicated some concern about the flow of information about the project, and possible disruptions during construction. However, in general, impacts were as people expected or not experienced. There were some examples of impacts being less than expected, including economic benefits. There were mixed views on visual impacts with some respondents seeing them as more than expected, and others less!

A review of media coverage showed the negative perceptions towards the project were more dominant at the pre-approval consultations stage, and were much less so in the construction and O&M stages. Key negative comments included potential impacts on the Trump golf course, on shipping lanes, on wildlife and a concern re financial viability. Conversely, the positive perceptions remained strong throughout the life cycle. These included the benefits of renewable energy, carbon reduction, potential economic benefits and job creation in the Aberdeen city and region. The overall outlook, as illustrated in Figures 10.2 and 10.3, shows a clear balance of positive comments as reported in the media.

11. Actual social impacts – O&M stage

11.1 Community Benefits Fund

11.1.1 Fund development

In contrast to onshore wind, the consideration of community benefits from offshore wind projects is relatively new and has been managed more flexibly, reflecting the developing nature of this new industry (Glasson, 2017). Some, predominantly near-shore English and Welsh wind farms (eg North Hoyle and Rhyl Flats off the north Wales coast) have followed the pattern of the onshore wind farms, with benefits pro rata to MW size. But in many cases, and for some of the latest large North Sea distant offshore wind farms, the benefits packages have to date proved to be more ad hoc and pro rata much smaller than for on-shore projects. However a recent £9 million Community Benefits initiative by the Danish energy company Dong/Orsted, in relation to its Hornsea One and Race Bank wind farms, is of note; a fund will distribute nearly half a million pounds a year to help local initiatives for each of the next 20 years (Dong 2016). A report by the University of Edinburgh on community benefits from offshore renewables (Rudolf et al 2014), recommended the avoidance of restrictive guidance for the relatively new, developing and risky by nature offshore renewables industry. However, the Scottish Government has been at the forefront in considering the distribution of the benefits from offshore renewables beyond the delivery of supply chain benefits, and has developed *Good Practice Principles for Community Benefits from Offshore Renewable Energy Developments* (Scottish Government, 2014). The Beatrice OWF project provides a recent Scottish example (SSE, 2016), with a benefits fund of c£6m over the 20 year project life, divided between Highland (£4m) and Moray (£2m), and equally between a Beatrice Partnership Fund (BPF) and a Local Fund for each area (i.e. for Moray, £1m Partnership Fund and £1m Local Fund).

The Aberdeen OWF Community Benefits Fund (CBF), known as the *Unlock our Future Fund,* built on such pioneering Scottish work, as well as on other UK and international examples. Claire Haggett of Edinburgh University provided guidance on the Aberdeen OWF CBF in a report for the project (Haggett, 2018). Two key points included:

- as a small project, the Aberdeen project fund will be less than for other recent UK projects and expectations need to be managed; and,
- as noted in the Scottish Government Good Practice guidance, the limiting features of the fund (by geography, topic and beneficiaries) "should be driven by the local community, who should play an active role in determining how funds are spent".

The Local Community Liaison Officer for the project followed up the guidance with a three month consultation period, involving discussions with local stakeholders, and an online survey of the local community on various options and priorities for the Aberdeen CBF (see Appendix 4). Our research had access to a sub-sample of the online responses, where respondents had indicated their willingness for the project to view their responses. There were about 100 of these in total, almost wholly from Aberdeen City and Shire, and largely aged 45+. Important respondent themes for the CBF included a mix of support for community, enterprise and environment initiatives. In terms of the geographical focus of beneficiaries, there was a clear preference for the whole of Aberdeenshire and Aberdeen City to benefit from the fund, although with sizeable smaller groups favouring the wards closest to the site (mainly from Blackdog and Belhelvie respondents), and the Energetica coast and wards in sight of the wind farm.

11.1.2 Fund elements

The agreed fund, announced in mid-2018, includes the elements as set out in Table 11.1.

***Table 11.1**: Key elements of the Aberdeen OWF Community Benefits Fund (CBF)*

Size of the CBF	£150,000 pa over 20 years; £3m in total
Geographical distribution	Over the whole of Aberdeen City and Aberdeenshire, but with 10% (ie £15, 000) pa ringfenced for Blackdog
Foci of the fund	• **Focus on future generations and untapping local potential**: preparing communities for the future, not fixing problems as they arise • **Capacity building:** skills, people and community development • **Community partnerships**: empowering and strengthening communities • **Community infrastructure for the future:** community spaces and transport • **Innovation:** demonstrating a positive future impact • **Positive environmental impact**: renewable and sustainable • **Enhancing quality of life for all**
Structure	Two levels of application—small projects, and large projects. A part-time community development officer will be appointed for first two years to offer support to communities to develop ideas and approaches to make the most of the funding and achieve maximum impact
High-level criteria	• ensure a legacy and lasting impact • contribute to a climate smarter world with sustainability at its core

	• invest in community facilities that are fit for the future and environmentally sustainable • demonstrate clearly a benefit to the local community • match funding is encouraged but not required
Decision making body	• setting up of organisation underway in Autumn 2018 • community champions panel establised to advise • collaboratively establish governance, administration, spending priorities and strategy, refined criteria and application process, and management processes • establishing legal framework and agreement between Vattenfall and the organisation that will operate the fund.

11.1.3 Early fund operation

First applications were invited from early 2019 and the first round allocations are set out in Table 11.2. The 10 grants reflect clearly the high level environmental sustainability and community criteria set out in Table 11.1. The application process is managed by grant-making charity Foundation Scotland. The next application round will open in January 2020. At the time of this report (August 2019) it appears that there have been no applications from the Blackdog community; this may be due to the current lack of a residents' association and /or the perceived complexity of the application process. Hopefully, this will soon be resolved.

Table 11.2*: Unlock our Future Fund -- first round allocations*

Application supported	**Allocated funding**
Community Energy Scotland Limited - to fund community engagement sessional staff who will work to build the capacity of eight local community organisations across Aberdeen and Aberdeenshire in order to develop innovative community energy projects and build the sustainability of local community facilities.	£15,000
ProtoAU - to contribute to the costs associated with this Aberdeen University group's participation in the Shell Eco Marathon 2020 and to help improve its hydrogen-fueled vehicle's performance	£5,000
Strachan Village Hall - to contribute to the cost of installing three innovative wall-mounted air source heaters.	£10,000
Aboyne and District Men's Shed - to contribute to the building of the innovative Aboyne and Mid Deeside Community Shed development through the provision of solar panels.	£9,000
Aberdeenshire Sailing Trust - to help purchase an electric vehicle to tow the group's boats and to move equipment and staff between sailing and storage venues.	£15,000
Fittie Community Development Trust - to contribute to the purchase and installation of an environmentally sustainable heating system in the community hall.	£8,500

Meldrum Amenities Improvement Group - to help replace the group's old diesel tractor with an electric utility vehicle	£15,000
Westhill and District Men's Shed - to purchase an electric arc welder, hydraulic mobile lift table and steel storage cupboard, to help their work in recycling lawnmowers.	£1,000
Tarland Development Group - to contribute to the development of an environmental education facility near Tarland, which will benefit several local groups, including an innovative indoor teaching beehive, and a project to conserve, grow and swap local heritage varieties of flower and vegetable seeds.	£15,000
Tigh a'Chomainn Camphill Limited - to contribute to the purchase of an electric vehicle for this home for adults with special needs in Aberdeen, to allow residents to access destinations which are not served by public transport or are not accessible by the residents by bike.	£15,000
Huntly and District Development Trust - to fund a feasibility study into the development of a network of community-owned electric car charging points.	£10,000
Total allocated funds	**£118,500**

11.2 *Views of O&M stage impacts as identified by various community groups*

In addition to experience during the construction phase of the windfarm, the respondents to the survey in early 2019 were also asked their experience of the same range of impacts during the early O&M stage. The responses were essentially the same, except for a slight increase in those responding that the visual impact from the onshore component was more than expected (from 6% to 13% of respondents) and visual impacts from the offshore turbines from 7% to 13% for less than expected and 11% to 21% for more than expected (Table 10.3)

***Table 11.3**: Summary of responses on experience of impacts during early part of O&M phase*

Potential impact	*Not experienced*	*Less than expected*	*More than expected*	*As expected*
Traffic	62%	11%	2%	25%
Visual impacts from onshore component of AOWF	29%	17%	13%	41%
Project bringing benefits to local economy during operation	42%	16%	7%	35%
Project providing local employment opportunities	47%	14%	6%	33%
Project bringing change to community character	46%	12%	7%	35%
Visual impacts of offshore turbines	22%	13%	21%	44%

Project providing local education opportunities	45%	14%	4%	37%
Project bringing social benefits	49%	16%	7%	28%

A small number of open responses to the survey cited distance from shore as being something they had not really been aware of e.g. 'consensus was that they would be much less visible by being located much further from land'. Others provided the seemingly conflicting views e.g. that whilst they were 'surprised' about their actual size this was 'not a problem'. Another commented that they 'don't enjoy the view…but understand the benefit'. A number attached very positive expressions to their statements e.g. delighted, look great and commented on the benefits they bring ('clean energy').

A second survey of the experience of the local community during the O&M stage was carried out in late summer 2019. The survey was distributed during one Saturday in July 2019 to residents and visitors to Balmedie and also made available for completion on line. A notice of the survey and link to the online version was advertised in the *Belhelvie Banter* (distribution to 2000 homes) in August/September 2019. A combined total of 41 responses were received.

The survey asked respondents to select statements which they considered reflected their feelings about the EOWDC specifically (Table 11.4) and in relation to wider issues (Table 11.5). Respondents were asked to select as many as applied to them.

Table 11.4: *Responses to statements, which reflect 'feelings' about the EOWDC during first year of O&M*

a) It's brilliant	b) It looks great	c) I'm surprised how close to shore it is but not bothered by it	d) It upsets me that it is so close to the shore	e) I like to watch the turbines move	f) I prefer when the turbines are still
5%	7%	51%	24%	32%	5%
g) I don't enjoy the view of them	h) I would like to be able to view them close up by boat	i) They spoil the seascape	j) They enhance the seascape	k) I'd like to see more offshore windfarms	l) I get excited when I see them
24%	29%	29%	15%	37%	7%

Table 11.5: *Responses to statements, which reflect their opinion of the EOWDC in relation to wider issues*

a) Good to see clean energy being generated	b) I understand why we need offshore windfarms, but they should not be here	c) Windfarms should always be further offshore than this one	d) Its presence effects the area in a positive way	e) Its presence effects the area in a negative way
80%	17%	32%	17%	15%

f) I am more drawn to the coast due to its presence	g) I do not visit the coast as much as I used to due to its presence	h) I now have more understanding of renewable energy technology then I used to	i) Originally, I did not support the windfarm but now my opinion has changed	j) Before the windfarm was constructed, I could not image it being here but now it is part of the geography of the area
2%	10%	29%	7%	37%

Those who selected that they 'spoil the seascape' tended to also reply that they should be 'further offshore'. They also tended not to select the option that they liked to see clean energy being generated. Respondents were also invited to provide open comments. A small number of respondents did comment on the personal negative effects of the windfarm e.g. 'the whole area is spoilt', 'was excited but ruined scenery'. Others commented 'looks fine and doesn't bother me', 'all the negativity seems to be based on the appearance of the farm'. Some commented on potential tourism benefits e.g. 'we've already seen them up close on an RNLI boat at their family open day' and the desire for more information on the wider impacts e.g. ' I would be interested to see how much employment and additional revenue has been generated locally … as well as how much it contributed to the national grid'.

***Box 11.1**: Comparing Social Actuals with Predictions -- O&M stage*

The same caveat applies to the comparison between actual and predicted social impacts for the O&M stage as noted for the previous stages. The main aspect noted in community surveys about feelings about the development in the first year of operation mainly related to visual impact of the turbines -- *I am surprised how close to shore it is but not bothered by it (51%); it upsets me that it is so close to the shore (24%).* In relation to the wider context – 80% noted *good to see clean energy being generated,* 37% noted *before the windfarm was constructed, I could not image it being here but now it is part of the geography of the area,* and 32% *thought windfarms should always be further offshore than this one.*

A major social/economic impact of this stage was the introduction of the EOWDC Community Benefits Fund (CBF), known as the *Unlock our Future Fund.* This was not included in the ES because developers provide such benefits voluntarily, and additionally, outside of the planning and licensing process for major projects. They are not mitigation measures to manage adverse project impacts, nor are they enhancement measures for increasing positive project impacts; as such, they are not material considerations in the project decision-making process (Walter, 2012).

The process of establishing the fund, with good local stakeholder and community engagement, represents a very good example of a community benefits initiative for UK offshore wind farms. At £1500 per installed MW pa, it also represents a higher level of funding than many recent UK OWF projects. There is also recognition of the local Blackdog community with a sub-allocation of the fund for its own community projects.

PART D : ABERDEENSHIRE FLOATING OFFSHORE WIND FARM COMPARATIVE SOCIO-ECONOMIC IMPACT STUDIES

12. Introduction

As well as the EOWDC project in the Northeast of Scotland, there are two other significant offshore windfarm projects in the immediate area. The five turbine, 30 MW, floating Hywind Scotland Pilot Park Project (off Peterhead) is now operational. The six turbine floating Kincardine Offshore Windfarm Project, with a nominal capacity of 50MW, has now partially started generating, but with just 2MW to date. This part of the report briefly reviews the socio-economic content in the Environmental Statements (ES) of these two OWF projects and notes any evidence on actual impacts. Part E compares them with the EOWDC project.

Generally and until recently, socio-economic impacts have not been carried out in a consistent manner in the assessment of the impacts of major projects. This has seen wide variations in content and approach. Given the close proximity of the three Northeast Scotland offshore windfarms it is useful to assess the approach and methodology taken; this may assist in providing for an eventual more integrated and comprehensive assessment for all stakeholders involved in these projects in this area. These two projects also provide an opportunity to explore any particular socio-economic impacts associated with the new offshore floating windfarm technology.

13. Hywind Scotland Pilot Park Project (off Peterhead)

13.1 Assessment of socio-economic indicators and Impacts

The assessment, which formed a 62 page report conducted by Optimat (2014), identifies the potential impacts associated with the construction, O&M and decommissioning of the five turbine floating offshore wind farm located 25km east of Peterhead and with a landfall location for the connector cable being in Peterhead itself. The scope of the report covers the direct and supply chain economic potential impacts and the potential impacts on the local tourism and recreation activities.

Assumptions used for the impact assessment are total project capital expenditure of £150m , equating to £5m per MW installed and £100m operational spend over a 20 year timescale, based on £5 million per annum average spend. The calculations were undertaken in accordance with Scottish Enterprise's economic impact assessment and additionality guidance, the HM Treasury Green Book guidance and the Scottish Government Annual Statistics.

13.2 ES Summary of predictions

The ES used two main scenarios to assess the economic impact of the project on the Scottish supply chain:

- Scenario 1: 100% construction and installation, operation and maintenance, and decommissioning activity carried out in Scotland over a 25 year project timescale, except for turbine manufacture and heavy lift vessel charter costs; and
- Scenario 2: all construction and installation work provided from outside Scotland, with O&M and decommissioning activity provided by Scottish based businesses.

Under Scenario 1 - the projected economic impacts are:
• a total potential capital investment of £210m, equating to around £84m direct and indirect GVA;
• £100m capital spend on construction and installation resulting in a potential £40m direct, indirect and induced GVA in the Scottish economy within a two 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;
• £100m long-term O&M spend, generating a potential £40m GVA and supporting 33 FTE net direct, indirect and induced jobs over the 20-year project timeframe; and
• £10m capital spend on decommissioning of five turbines after completion of the 20 year project, supporting around 21 temporary short-term jobs within a six month time window.

Under Scenario 2 – where only O&M and decommissioning takes place in Aberdeenshire and the rest of Scotland, the projected total economic impacts are:
• £110m operational spend over 20 years of the project lifetime, generating an estimated £44m of GVA and supporting 33 FTE long-term direct, indirect and induced jobs;
• £10m decommissioning expenditure for the removal, re-use and/or recycling of five offshore installations, generating £4m of direct and indirect GVA creating around 21 temporary jobs over a six month operational window.

13.3 Methodology - direct and supply chain impacts

The direct and supply chain impacts were measured quantitatively by calculating GVA and FTE jobs, using turnover to GVA ratios obtained from the ONS (Office of National Statistics) guidance notes that are specific to the sector from where the impact is derived. The consultants stated that 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. 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 project lead to a reduction of economic impact elsewhere in the economy (e.g. 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; and
• *Multipliers* – the first round of multiplier impact (i.e. the increase in turnover of supplier companies to the projects).

The impact assessment indicates there could be around £8 million direct spend in and around the Peterhead area during the onshore construction phase, under Scenario 1.

13.4 Economic impact significance

It was considered that the overall economic impact significance of the Hywind project ranges from minor to moderate, where the magnitude and consequence of nearly 260 FTE jobs supported and £40m GVA during construction and installation in the first two years is judged to be moderate—under Scenario 1. Both the predicted £5m spend pa and 33 FTE jobs during O&M, and the £10m spend and 21 temporary jobs during decommissioning, are considered to be of minor magnitude and consequence.

It is the wider impact of the project that the ES considered to be more positive, with the project having the potential to attract inward investment especially for turbine manufacture, tower/substructure fabrication and O&M operation which would have significant economic impact. It is noted that the five turbine pilot Project alone is unlikely to attract investors to setup facilities in Scotland. The ES considered that the Hywind project is potentially a springboard to the wider opportunity for Scotland of developing expertise in floating offshore wind, where experience gained (e.g. 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.

13.5 Impacts on tourism attractions and recreation activities in the study area

The ES includes commentary on the area as a location for tourism, and for local coastal recreation activities, including recreational boating and sailing, surfing and sea angling. This tourism and recreation study area used 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 area contains the following tourism and recreation sites and activities:

- visitor attractions including the Slains Castle and the Arbuthnot Museum in Peterhead;
- 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 attracting visitors with interests in walking, bird watching and other wildlife watching;
- walking and cycling is an important recreational activity;
- a number of cruise and charter boats operate from bases in the area;
- 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); and
- other significant attractions include sailing, sea angling and water sports

The ES assessed the impacts on key tourism attractions and recreation activities as of negligible significance for both the construction and O&M stages.

13.6 Updates and actuals

- The actual construction work for the turbines took place at Stord in Norway during 2017.
- In November 2018 Halvor Hoen Hersleth, plant manager at the Equinor's Hywind Scotland pilot park, said a "lower" number of local companies competed for contracts for the project than expected. He confirmed that Northeast firms could do more to win orders and that in the O&M stage there is almost none of the work that could not be done locally once the industry was in place.
- In Nov 2018, Equinor opened the Hywind Hub at Peterhead Academy, the result of a £60,000 donation. This was used to transform a former disused classroom into an "ultra-modern" renewables space, complete with screens, break out areas and turbine models. The facelift was the result of a collaboration between Hywind, Aberdeenshire Council and Peterhead Academy.
- In July 2018, Batwind partners Equinor and Masdar opened a world first battery storage solution in Peterhead. Electricity produced at Hywind can be transported via cables to an onshore substation where the 1 MW batteries are placed and connected to the grid. The battery capacity is the equivalent of more than 128,000 iPhones.
- In Nov 2018, Equinor confirmed it was on the lookout for another floating wind site west of Shetland.
- A small number of jobs have been created at the Peterhead O&M base.

Whilst it is not possible to provide a direct comparison with the ES predictions, it is clear that Scenario 1 is not applicable, and indeed there may be less local economic benefit from the O&M stage than anticipated in Scenario 2.

14. Kincardine Offshore Windfarm

14.1 Introduction

Kincardine Offshore Windfarm Ltd (KOWL) is a company originally formed by Pilot Offshore Renewable Energy (PORL) and Atkins Ltd. PORL is an Aberdeen based joint venture between MacAskill Associates Limited and Renewable Energy Ventures (Offshore) Ltd. Both are Scottish companies with extensive experience in the wind industry. KOWL was established in order to develop, finance, construct, operate, maintain and decommission the Kincardine Offshore Windfarm. In 2018, the Spanish Cobra Group acquired the majority ownership of the development. The windfarm began exporting power in October 2018 with 1 x 2MW unit turbine. The developer plans to install five more floating wind turbines at the site, each with an individual output of up to 9.5 MW. Kishorn dry dock in Wester Ross, a site unused for 23 years, was used for construction and to help build the floating turbines.

14.2 Summary of socio-economic predictions

The developers commissioned Atkins carry out the following:

- Environmental Scoping Assessment

- Environmental Baseline Studies and Reports
- Environmental Impact Assessment and Environmental Statement (March 2016, Atkins)

The socio-economic assessment considered both the anticipated economic and employment impacts across the project area. Atkins stated that the methodology for the evaluation of the socio-economic impacts of the development used previous experience of similar developments, professional judgement, statutory requirements and Government advice. The assessment considered how the development will affect the socio-economic baseline conditions, during both construction and O&M stages. Given the nature of the development, quantitative and qualitative impacts are considered, where possible, including employment, possible disruption during the construction phase and other impacts. The report states that there is no high-level guidance as to preferred criteria for socio-economic assessment; the significance of the socio-economic effects of the project will be based on defined assessment criteria, as set out in a table in terms of impacts. No reference is given to Scottish Enterprise or HM Treasury criteria.

14.2.1 Construction predictions

Construction of the *substructures* was expected to be undertaken within a Scottish port facility and this was likely to include a significant level of fabrication support for the substructure assembly at a regional/UK wide level. The project and enhancement of skill sets associated with the construction of the KOWL floating units would form a positive, short-term (up to two years), employment opportunity for the selected port site. It was expected that over 50 people would be required to support the construction and installation of the turbines within the construction port over a two- year period, representing a net economic benefit to the regional/national economy.

It was anticipated that all of the WTG unit (tower, blade and nacelles) would be fabricated outside of Scotland and transported to the construction base for assembly. This was likely to provide additional local development and skill enhancement to the local port construction workforce, which could enable further windfarm development opportunities for the local workforce. The construction of the project was expected to create a small number of short-term employment opportunities in the area; there would be demand for skilled onshore and offshore construction workers, vessel operators and engineers. Given the nature of the development and the type of skills available in the local labour market, it was anticipated that these jobs would be fulfilled using existing employment from the Aberdeen City and Shire labour markets. The equivalent of approximately 40 jobs were anticipated to be required in order to assemble and install the turbines. The construction period for the onshore and offshore section of the connecting cable to the sub-station was likely to be between three to six months; it was estimated that the installation of the cable would employ a maximum of 20 people.

The offshore section would also require the charter of a suitable vessel and associated crew. It was expected that an existing vessel from either Aberdeen or Peterhead harbour would be used to support the offshore cable element. In addition, further indirect jobs wouldbe supported locally and regionally through supply linkage and income multiplier effects. This includes firms

supplying construction materials and equipment. Employment and economic impacts are considered a temporary, beneficial effect, of minor significance for the economy of Aberdeen City and Shire.

KOWL had discussions with Scottish Enterprise with regard to undertaking a number of events in conjunction with its Tier 1 contractor to publicise the project, and to introduce smaller Tier 2 and 3 suppliers to the programme. These sought to provide them with an understanding of opportunities available during the CAPEX and OPEX phases and provide them with an introduction to KOWL and the Tier 1 contractors. This should assist local companies to access opportunities in both the CAPEX and OPEX phase of the development. KOWL has maintained a continuous dialogue with AREG since inception and will aim to work with AREG, SE, and the Councils to publicise the Kincardine programme, and to promote local content and employment opportunities. There appears to be no monetary valuations put upon the impacts in the ES.

14.2.2 O&M stage predictions

For one week every month during the 25-year operational life of the windfarm, the turbines will undergo checks and maintenance. This will require approximately four engineers and a supporting vessel, plus around four onshore support staff. As with the construction stage, it is anticipated that the required skills will be supplied by the existing Aberdeen and Shire labour markets. The skilled labour required, and potentially the vessel used, is anticipated to be shared with another offshore windfarm. An office, warehouse and substation will form the base for the operation and control of the project. It will consist of an office for up to 10 people to operate and manage the project, and provide an operations base for the offshore maintenance teams. These employment and economic impacts are considered to be negligible due to the very small number of existing jobs supported when considered in the context of the existing economy of Aberdeen City and Shire.

As KOWL is only a demonstrator development, rather than a large offshore windfarm, there will be limited opportunities to take on apprenticeships directly as part of the development. However, KOWL will work with its key contractors to encourage them to offer opportunities for school leavers through apprenticeships. There appears to be no monetary valuations put upon the impacts in the ES.

14.3 Tourism and recreation impacts

The ES predicted that the development will have a negligible impact on tourism and recreation in the local area. The distance of the development from the shore and a very limited onshore development element means there is no impact on existing tourism and recreation uses and users in the local area. Dunnottar Castle at Stonehaven is the only tourist attraction in any proximity to the proposed development and its operation and use will be unaffected by the development.

An addendum to the original assessment was subsequently produced after stakeholder consultation and Atkins reported further that previous reports on windfarms and tourism

highlight the complex dynamics between tourism and offshore renewables. Transferring the key elements of these studies to the Kincardine Offshore Windfarm suggests that the scheme is likely to have little impact upon employment in tourism or the activity of the tourism sector in the study area. There is also the potential for the project to have a positive impact on tourism in the area, as it will provide a technical tourist attraction for a number of technical groups and institutions from around the UK and World. As one of the first offshore floating windfarm demonstrators it will likely attract interest and a requirement to undertake offshore visits to the development area during the lifetime of the project. This additional tourism will generate revenue for the local area through a number of activities, including:

- transport and accommodation with the local area;
- additional people visiting the Aberdeen City area;
- placing Aberdeen on the world map for offshore renewables; and
- vessel hire and support.

Additional tourism interest will be generated by the KOWL visitor centre that will be placed within the near vicinity of the cable landing area, which will attract a number of additional visitors to the area. Examples of this exist in Scotland elsewhere already, with the Whitelee Onshore Windfarm visitor centre, South of Glasgow, being a significant contributor to the local economy through job creation and the number of visitors to the area surrounding the windfarm development. It also acts as an educational centre for schoolchildren from the surrounding area. Annual visitor numbers exceed 100,000.

Overall, the ES predicts no negative impacts (e.g. on tourism, local disruption), whilst a number of local and regional positive impacts are predicted for both the construction and O&M stages for a Scottish port and for the local onshore installation site.

14.5 Updates and actuals

Kishorn Dry Dock came out of a 23-year hibernation for use during the construction of the floating offshore windfarm. Last used to work on the Skye Bridge in 1994, the dry dock is one of the largest in Western Europe and was used to help build the floating turbines. Work started, after a long delay in 2018 and the first turbine was installed in the North Sea in the third quarter of 2018. It was used for the fabrication of the semi-spar substructure for the turbines. Creating up to 200 temporary jobs in the area. Highlands and Islands Enterprise (HIE) has invested c£160,000 of the £450,000 costs of upgrading the dock in readiness for new contracts. HIE's area manager for Skye, Lochaber and Wester Ross, Robert Muir, said: "*It is great to see Kishorn coming to life again. The dock has huge potential, not just for renewables, but for oil and gas and aquaculture too. The site will provide valuable rural jobs and contribute to both economic and community growth, and wider competitiveness of the region*."

Only a very small number of ports in the region are currently 'floating wind ready', these having helped develop the Hywind and Kincardine Offshore Windfarm projects. Nigg Energy Park and Peterhead are the best in Scotland, according to a report published by the Carbon Trust (2017). Many other ports have significant constraints for large floating wind structures.

PART E : CONCLUSIONS

15. Conclusions on the Aberdeen project socio-economic impacts

15.1 Conclusions in context

The research on the EOWDC project aims, through detailed monitoring over the lifecycle to date, to provide an evidence base of actual socio-economic impacts - particularly at the local and regional level - and so help to reduce uncertainties in future assessment/practices. The research compares these actual impacts, as far as is possible, with the predicted impacts in the Environmental Statement (ES) for the project. Further, as the consenting process in Scotland occurs at both national and local decision-making levels, it seeks to inform impact assessment and consenting for OWF more widely.

The research has generated some useful information on actual impacts, both economic and social, over key steps in the project lifecycle, including the pre-construction, peak construction, and early operation and maintenance (O&M) stages. This is compared with predictions in the various original ES documents. However, there are some caveats. This is a relatively small wind farm, and the scale had implications for some impacts, especially for offshore construction, with the main contractors noting that due to the small nature of the project and the resultant short construction period, most of the personnel working on the project were sourced externally to the local area. Detailed data on activities, workforce and especially sub-contracts were not available for these main contractors.

In addition, whilst it was possible to make some comparisons between ES economic predictions and actual impacts, this was more problematic for social impacts, which had little coverage in the ES documents. As such, any comparison for social impacts can only be with established good practice elsewhere, as covered in other Technical Reports for this research programme. See in particular Technical Report 1- Literature Review, Technical Report 2 – Review of ESs for UK Offshore Wind Farms, and the summary Guidance Report (All Oxford Brookes University/Vattenfall 2020).

15. 2 Economic impacts

The various actual – prediction comparisons are highlighted in the boxes in Part B of the report — Boxes 4.1 to 7.1. Some of the key findings are set out below.

There were no employment and expenditure ES predictions for the **pre-construction stage**, but Vattenfall has provided some data on actual project contracts, with a value totalling around £3m.Taken together with other smaller retail contracts, they bring an important share, c30%, of the £3-3.5m total into Aberdeen, Aberdeenshire and Scotland at large (ie c£1m).

The ES estimated **total capital expenditure** for the project at £260m (DTZ 2011). As at August 2019, the grand total of spend on the project was £278m. The distribution over the key construction years was £37m (2016), £100m (2017), £135m (2018) and £6m (2019) (Vattenfall contract data). Employment predictions for the **main construction stage** were of the order of 360 jobs for the Inner Study Area (Aberdeen and Aberdeenshire) (i.e. 180 jobs pa over two year period) and 740 (370 pa) for the wider study area (Scotland). These include both onshore

and offshore jobs. Contract expenditure predictions were for Scotland GVA of £40m, of which £16m would be in the Inner Study Area.

Predictions were sparse for **onshore construction** – 30p/t temporary jobs for 14 months work on sub-station and cable landfall. For actual employment, survey data for the main contractor, and estimates for the cable to Dyce work, indicate about 60 employees in total over a period of about 12-18 months. Survey work on the sub-station employees indicate c 60% of this workforce came from the Inner Study Area and most of the remaining 40% from the rest of Scotland. Local multiplier impacts may have increased the total employment impact to c90 for the period involved. This is significant locally, and substantially higher than predictions. Detailed contract data for the main sub-station contractor indicates about 33% of contract spend in the Inner Study Area, and another 15% in the rest of Scotland. With similar figures for the connection to Dyce, this would give an Aberdeen/shire spend of c£4m, with local multiplier impacts potentially increasing to about £6m, and for Scotland £6m with multiplier increase to £9m.

ES predictions were for c150 inner area (Aberdeen and Aberdeenshire) **offshore construction** jobs pa over a two year period. As noted above, for this relatively small project, the main contractors sourced a large percentage of the overall personnel working on the main offshore element external to the local area. It is not possible to be detailed on the actual local construction employment, but even allowing for a 50% indirect and induced multiplier impact, it is likely to be well below the predictions, at probably no more than 50-60 jobs pa, and as such similar to the actual onshore jobs impact. The ES prediction was for c£16m GVA in total in the inner area. The actual expenditure is estimated at £2.4m from details from both Vattenfall themselves, and from our own analysis of the project contract data. This is a big difference, and even bigger when adjusted to GVA. However, it does exclude any contracts associated with the two main contractors, which account for two-thirds of all offshore construction spend. If the local expenditure from those was pro-rata similar to that calculated above there would be an increase to c£7m. However, compared to onshore expenditure, this remains a major area of leakage of economic impact from the local, and from the Scottish economy

Estimates of the total economic impact of the construction stage are very roughly as follows. For the Inner Study Area, the estimates are c120 jobs pa (largely for 12-18 months only) and expenditure of c£12-13m. Of these figures, the onshore work appears to have the most significant local economic impact. The contract expenditure figure for Scotland as a whole is estimated at c£16-18m. Both the number of jobs and the contract expenditure (especially when adjusted to GVA) are, based on current information, considerably less than the ES predictions.

For the **O&M stage** ES predictions were for c660 job years over the life of the project for the inner area, and for a total GVA of c£20m for the same area. The overall contract value of the O&M stage, largely using locally based companies, may be of the order of at least £3m pa, and indirect and induced multiplier impact of up to another £3m, giving a total of c£6m – totaling undiscounted total expenditure of over £100m over the project life. Although adjusting to compare with the GVA prediction is not straightforward, it is likely that the actual O&M economic impact is well above that predicted. Most of the O&M staff are local and, with long-term contracts, there may be higher multiplier impacts, increasing total job impacts to c40-

50pa, giving a significant 800-1000 FTEs over the life of the project, and again well above the predicted O&M impacts in the ES.

In summary, the EOWDC project performed well against economic impact predictions for the onshore construction and for the early O&M stages of the project life cycle -- stages that tend to be underplayed in EIAs and in the ES documentation, but which are especially important for local economic benefits. The O&M stage is particularly significant in terms of the high local percentage of the total economic impacts, over a 20-25 year life. In contrast, for this project, the local and Scotland wide economic benefits from offshore construction appear to be very limited, and much less than predicted. There are some caveats, relating to the relatively small size of the EOWDC project, and data gaps from two key Tier 1 contractors, but even so, the actual impacts are estimated as being low and well below those predicted in the original ES documents. The nearby Hywind floating wind farm project appears to have even larger construction stage leakages, and indeed, there may be even less local economic benefit from the O&M stage than anticipated in the low impact scenario for that project.

This leakage of the offshore construction stage benefits is a major concern to local, regional and national authorities. For example, at an offshore wind summit in Edinburgh in early 2020, the Scottish Energy Minister commented, '*Scotland is the ideal location for offshore wind, but recent projects have not delivered the significant economic opportunities we want to see for Scottish businesses. The Scottish government has been calling for the offshore sector to do more by awarding contracts to our indigenous supply chain but recent disappointments suggest that more has to be done. I will use every lever at our disposal to ensure that our renewables supply chain benefits from the expansion of offshore wind in our waters, leading to the creation and retention of Scottish jobs'*. Under new measures agreed between the Scottish Government and the Crown Estate Scotland, developers will have to agree on supply-chain commitments when applying for offshore wind leases.

15. 3 Social impacts

The various actual – prediction comparisons are highlighted in the boxes in Part C of the report — Boxes 9.1 to 11.1. Some of the key findings are set out below.

For the **pre-construction stage**, there is evidence of much good practice in the Vattenfall engagement strategy, well managed by the project's Local Community Liaison Officer. There was extensive engagement with local residents and key local stakeholders, and a programme of community funding support, totaling at least £85,000 for a range of large and small projects. Although there were some local concerns from the Blackdog residents, there was recognition of Vattenfall's commitment to community engagement, plus awareness that some of the main local benefits were more likely in the O&M stage.

For **the construction stage**, for a small offshore wind farm project, with only limited direct local employment, any impacts of the construction stage on the local housing market, local services, quality of life and community cohesion, are quite small in total, and somewhat diffuse over the wider Aberdeen/shire area. The only community where the impacts were more concentrated was that of Blackdog, and even here, from survey responses, impacts were seen to be limited. Surveys of a wider Aberdeen/shire community indicated some concern about the flow of information about the project and possible disruptions during construction.

However, in general, impacts were as people expected or not experienced. There were some examples of impacts being less than expected, including economic benefits. There were mixed views on visual impacts with some respondents seeing them as more than expected, and others less.

Media coverage showed the negative perceptions towards the project were more dominant at the pre-approval consultations stage, and were much less so in the construction and O&M stages. These findings are not unusual as projects progress through the life cycle. Key negative comments included potential impacts on the Trump golf course, on shipping lanes, and on wildlife. Conversely, the positive perceptions, as reported in the media, remained strong throughout the life cycle. These included the benefits of renewable energy, carbon reduction, potential economic benefits and job creation in the Aberdeen city and region. The overall outlook shows a clear balance of positive comments as reported in the media.

For the early years of the **O&M stage**, the main aspect noted in community surveys about feelings about the development mainly related to visual impact of the turbines –' *I am surprised how close to shore it is but not bothered by it' (51%); 'it upsets me that it is so close to the shore' (24%).* In relation to the wider context – 80% noted '*good to see clean energy being generated'*

A major social/economic impact of this O&M stage was the introduction of the EOWDC Community Benefits Fund (CBF), known as the *Unlock our Future Fund.* This was not included in the ES because developers provide such benefits voluntarily, and additionally, outside of the planning and licensing process for major projects. The process of establishing the fund provided a good example of community engagement. At £1500 per installed MW pa, the fund also represents a higher level of funding than many recent UK OWF projects. There is also recognition of the local Blackdog community with a sub-allocation of the fund for its own community projects. A total of £118,500 was allocated in the first round for 11 community projects.

In summary, there was very little coverage of social impacts in the ES documentation, and there was no evidence of any significant actual impacts on social infrastructure, such as housing and local services. However, from the various surveys, there were some community concerns, although these lessened over the life cycle.

Community views of the project during the consenting and pre-construction stage comprised elements of 'resistance' due to uncertainty over the number, size and location of the turbines. Parts of the community felt 'blighted' due to decades of historic legacy of unwanted development and made vocal objection to the development. Yet others expressed that they did not mind the proposed development and sought to 'get on board' with the project. These differing views (possibly somewhat exaggerated by the media) did result in some limited loss of social cohesion within the communities during the pre-construction and construction stage, but this was less of an issue into the early O&M stage.

Concerning visual impacts during construction of the onshore and offshore elements, most respondents (over 50% in each case) felt that the impacts were as expected. These dropped slightly in a later survey of community views during the O&M stage, when 'as experienced' or 'not experienced' was the dominant response. Many responses used the word 'surprise' in relation to the wind turbines – how big they are and how close to the shore. Balmedie Beach

forms a good location to view them – as apparently does the Aberdeen Bypass. The biggest 'feeling' in relation to the windfarm was that it was '*good to see clean energy being generated'* (80%). However, a number of qualitative comments indicate some conflicted viewpoints e.g. *'not great for the seascape but the renewable energy is necessary'*.

Of importance for management of both social and economic impacts is the engagement strategy of the developer.There is evidence of much good practice in the Vattenfall approach, well managed by the project's Local Community Liaison Officer, throughout the life cycle from pre-construction through to early O&M. The introduction of the EOWDC Community Benefits Fund (CBF), known as the *Unlock our Future Fund,* is another very important feature of long-term community engagement.

16. Conclusions on comparative projects and cumulative impacts

16.1 Conclusions on comparative projects

On methodology, the Hywind project uses a relatively detailed and established methodology: Scottish Enterprise's economic impact assessment and additionality guidance / HM Treasury Green Book guidance. In contrast, the Kincardine project uses a more ad-hoc/professional judgement approach, with no monetary valuations put upon the impacts, and a very high-level assessment of potential jobs.

The Hywind Scenario 2 predictions indicate little local impact from the construction stage, which appears to be borne out in practice. However, for the O&M stage the prediction is for expenditure of c£5m pa with c33 jobs in total; much of this is expected to be locally sourced. The predictions for Kincardine suggest c110 jobs in total for various elements of the construction stage, but estimates of the local element are unclear.

It seems reasonable to assume that floating windfarms would have more flexibility in construction location than conventional OWFs, with the possibility of generating very little construction stage socio-economic impacts in their final destination location. This does seem to be the case for the Hywind project. However, in contrast, the Kincardine project does provide an example of where there can at least be some regional benefits, if an appropriate construction base is available. For the O&M stage, there may be more similarity in socio-economic impacts with conventional OWFs.

Table 16.1 provides a summary of some of the socio-economic features contained in the ESs for the three Aberdeen coastal OWF projects.

***Table 16.1** : Comparative summary of socio-economic content of the ESs for the three Aberdeen coastal ESs*

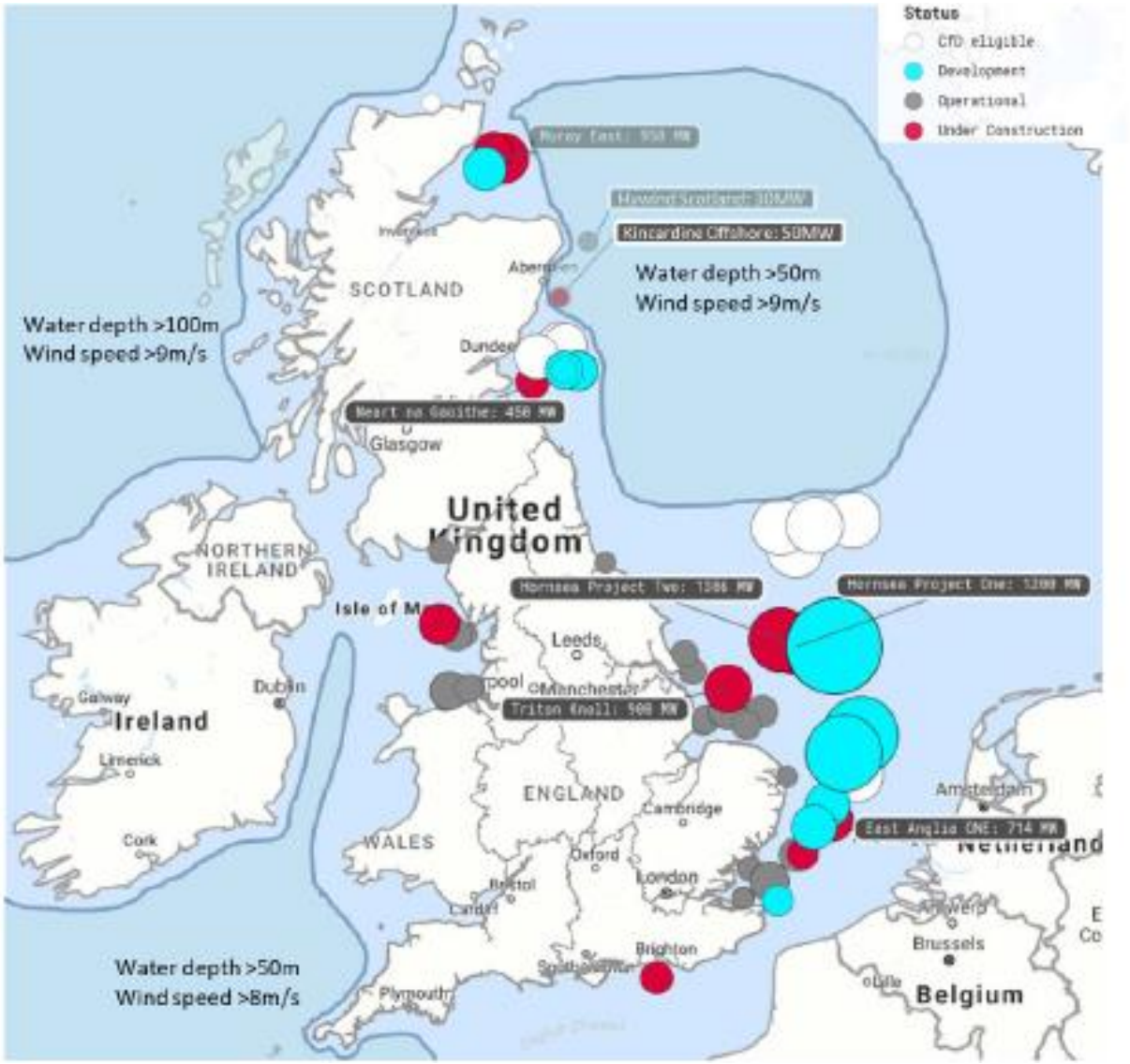
Socio-economic content in ES	Hywind	Kincardine	EOWDC
Methodology: Scottish Enterprise's economic impact assessment and additionality guidance / HM Treasury Green Book guidance	✓	×	✓
Stages of development covered – construction /O&M/ decommissioning	✓	✓	✓
Consideration of both onshore and offshore impacts	X	✓	✓
Scale of analysis of impacts—local, regional, national	✓	✓	✓
Direct employment effects, including employment generation, local content and safeguarding of existing employment;	✓	✓?	✓
Indirect employment effects; other labour market effects, such as changes in wage levels or commuting patterns;	✓?	×	✓?
Expenditure and income effects, including the use of local suppliers and other types of project-related expenditure;	✓	?	✓
Displacement/ Leakage/ Multipliers used	✓	×	✓
Employment impacts – no of jobs created	✓	✓	✓
GVA impacts – monetary impact of direct and indirect expenditure calculated	✓	×	✓
Economic effects on existing commercial activities (including tourism);	✓	✓	✓
Effects on the development potential of the area, including changes in the image of the area or in investor confidence;	✓	✓	✓
Social effects/ impacts on human population and in particular local residents and community	×	×	X?

16.2 Cumulative impacts issues

Cumulative socio-economic impacts from construction were not seen as significant for the projects in terms of a negative pressure on the local economy/workforce. However, there were perceived opportunities in terms of developing local supply chains and skilled labour inputs, and with the potential to attract inward investment especially for turbine manufacture, tower/substructure fabrication. For the long-term O&M stage, there may be some opportunities for sharing, including for example vessels servicing the turbines.

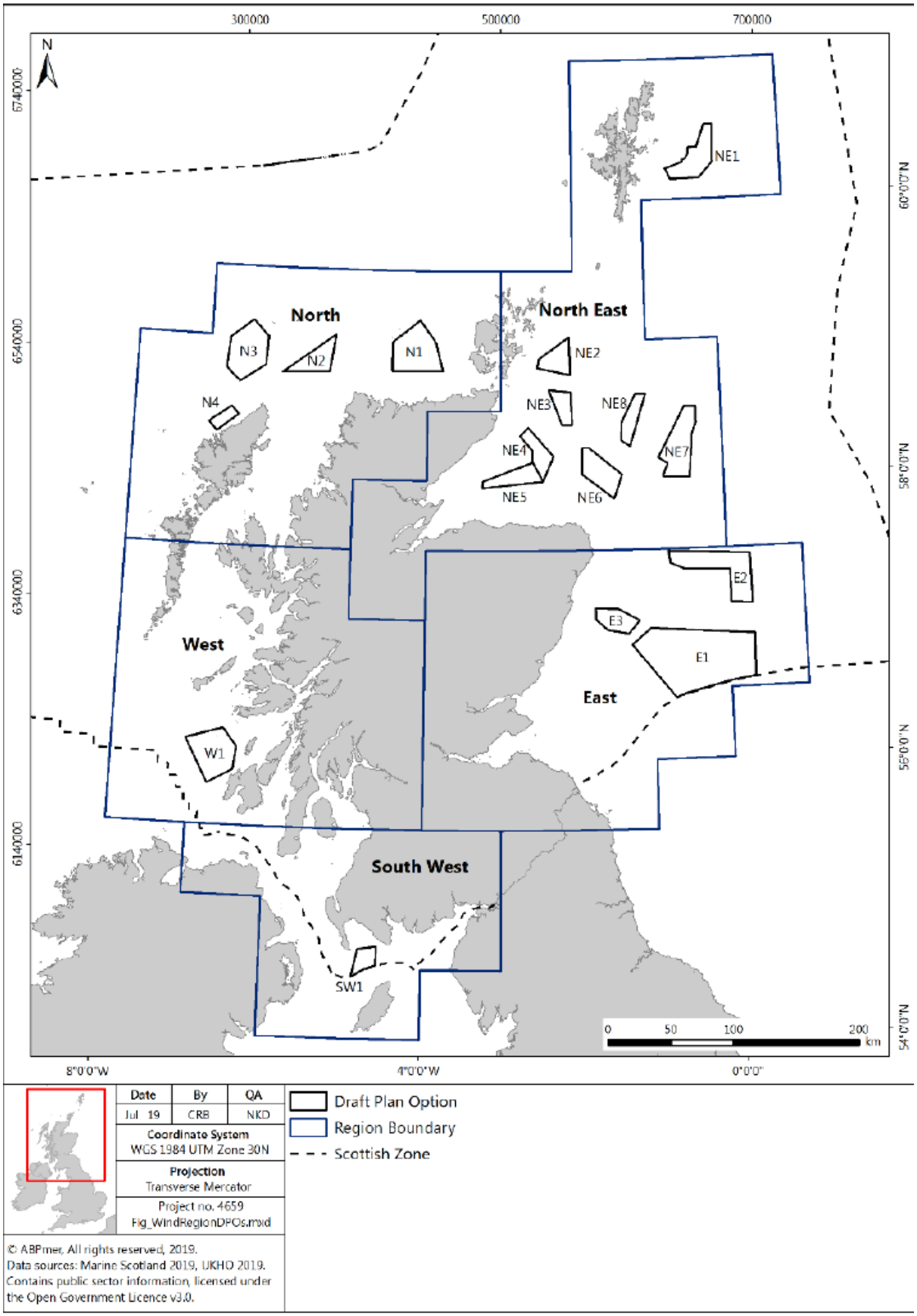
There is also the important innovation, and demonstration, features of the three projects. The Aberdeen project is pioneering innovations in turbine size, foundations, cabling, and control systems. The other projects are pioneering floating windfarm technology. The Hywind ES considered that the project is potentially a springboard to the wider opportunity for Scotland of developing expertise in floating offshore wind, where experience gained (e.g. design, construction, installation, O&M and decommissioning) could lead to cumulative projects. For example, a potential larger offshore park off the Scottish coast or in-combination with 12 other current/future offshore projects off Scotland. A Crown Estate study (2018) identifies the macro-economic potential of floating offshore wind in vast areas of deeper water further off the Scottish Coast. Figure 16.1 outlines the potential deeper water locations. For Scotland, the Draft Sectoral Marine Plan for Offshore Energy (Scottish Government, 2019) sets out some option areas for OWF development – both floating and fixed (Figure 16.2).

***Figure 16.1**: Indicative floating wind farm locations compared to existing UK offshore windfarm portfolio*



Source: Crown Estate (2018)

Figure 16.2: *Draft Plan Options - Draft Sectoral Marine Plan for Offshore Energy*



Source: Scottish Government (2019)

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