MAINSTREAM RENEWABLE POWER

Neart na Gaoithe Offshore Wind Farm

Supply Chain Plan

8 October 2014

Important Information

Mainstream Renewable Power Limited, following consultation with and input from certain of its major suppliers, presents this Supply Chain Plan to the Department of Energy and Climate Change (DECC) for the sole purpose of DECC's evaluation as to whether or not the Neart na Gaoithe Offshore Wind Farm Project meets the approved Supply Chain Plan eligibility criteria required by the Project as a pre-condition of eligibility to apply for a CfD.

At this stage, Mainstream, on its own behalf and on behalf of those of its suppliers, who have helped compile the information in the Supply Chain Plan and its annexes, advises DECC that all information in the Supply Chain Plan and its annexes is commercially sensitive and confidential and should be treated as such. In particular, DECC is asked to appreciate that information in respect of pending technological or other innovations or new business development plans is extremely sensitive because of its value to competitors. Release of such commercially sensitive information would be materially detrimental to the interests of Mainstream and all affected parties.

Mainstream recognises that if a CfD is awarded to the Project, DECC may wish to share information with the supply chain and to support implementation. In such circumstances, Mainstream will work with DECC, supported by its affected suppliers, to agree a shorter version of the Supply Chain Plan for publication at CfD award that respects the confidentiality of, then, commercially sensitive information. Mainstream, supported by affected suppliers, will again work with DECC to agree a longer version for publication that respects the confidentiality of, then, commercially sensitive information, if DECC wishes to publish a longer version of the Supply Chain Plan at the Milestone Delivery Date.

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1 Executive Summary

The Neart na Gaoithe Offshore Wind Project is a 450MW renewable energy project off the coast of Scotland in water depths of 45-55ms, currently under development by Mainstream Renewable Power Limited. Mainstream has been developing this project for the past six years and anticipates that the project will achieve its non-recourse financial closing in Q1 2016 with construction starting in Q1 2016 and first commercial supply of electricity occurring in Q2 2018.

The Neart Project's Supply Chain Plan sets out the material contribution to the economic growth and development of the industrial supply chain supporting the offshore wind sector under the headings (i) competition, (ii) innovation and (iii) skills.

The Project's material contribution to the economic growth and development of the industrial supply chain, through competition, is evidenced in Mainstream's status as the sole non-utility developer of offshore assets in the UK and its associated requirement to project finance the development. This drives Mainstream to aggressively look to drive down costs through (a) competitive tendering, (b) managing the procurement activities of its Tier 1 suppliers, and (c) its hands-on engagement with potential new entrants to the industrial supply chain.

By successfully bringing the Project through to the end of its development cycle, Mainstream has:

- Run a world class tender process for the turbine and construction work packages, involving over 30x companies worldwide, 50% of which are new entrants to the offshore wind sector;
- Selected four supply chain partners with strong track records of innovation and execution, who together will deliver the Project at lowest cost, using best available engineering techniques and development of a new skills base; and
- Embraced innovation with cutting edge technologies, extensively researched and de-risked, such as:
  - the Siemens 7MW direct drive turbines;
  - a revolutionary Offshore Transmission Module that eliminates the need for a dedicated offshore foundation and platform for the offshore transmission equipment;
  - three legged jackets;

all in a drive to be "first in class" with the Neart Project and drive down costs.

Mainstream's supply chain structure is in the final stages of being fully formed. Long-form Heads of Terms are fully negotiated and signed with GeoSea. Separately, long-form Heads of Terms are undergoing final head-office sign off in STDL / Prysmian. Negotiations with Siemens Wind are at final full-form contract negotiation stage involving commercial and legal teams.

In line with the UK Government's strategy of introducing competition into the offshore sector, Mainstream, as an independent developer/sponsor, is positioned with Neart to deliver the lowest LCOE seen in the UK's offshore wind market. Mainstream has been working collaboratively with its Tier 1 supply chain partners throughout 2014 to find cost savings through engineering innovations and procurement strategies. Neart can now bid below the published Administrative Strike Prices for CFDs, while still achieving investment grade equity returns, satisfying lenders and implementing required project finance structures.

The details in this Supply Chain Plan reflect the Project's level of advancement and contains factual statements backed by evidence. This Supply Chain Plan is not aspirational or forward looking. In developing the Project, Mainstream Renewable Power will continue to work across industry to help build a competitive supply chain that will deliver innovation, skills and competition to the UK offshore wind sector. Successes achieved in these areas will enable Neart to provide a cheaper energy generation solution and better value for consumers.

2 Competition

2.1 Encouraging competitive procurement processes

Open competition across the supply chain to ensure the widest pool of candidates are able to bid for, and win, contracts

Mainstream Renewable Power (**Mainstream**), as the only non-utility company with offshore wind assets under development in the UK, does not have a utility balance sheet. Therefore, it must use all competitive market forces available to it to make its offshore wind assets, and their build out, economically viable. To do this, Mainstream has sought out best prices from the supply chain for the last six years on the Neart na Gaoithe Project (**Neart**, **NNG**, or the **Project**).

Mainstream has championed best practice in the use of extensive and competitive procurement processes for the major work packages to be awarded in respect of the Project. In 2012-2013, Mainstream approached the market to determine the appetite of potential suppliers to engage in a project built under a Turbine Supply Agreement (**TSA**) and a single Balance of Plant (engineer, procure, construct, or **BOP EPC**) contract.

In order to satisfy project finance requirements, Mainstream has sought to minimise the number of (Tier 1) construction packages and points of contractor interface, hence initially settling on a two work-package strategy. In total, 31 companies drawn from across three continents and multiple sectors engaged with Mainstream during the initial tendering and detailed pre-qualification stage. These companies are listed in full in Table 1 below.

BOP (EPC)		Turbine
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
[redacted]		[redacted]
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[redacted]		
[redacted]		

Table 1: Turbine and Principal Contractor (EPC) Long-Lists

The companies listed in the Balance of Plant column cover the following work package areas: vessels, foundations, cables, sub-stations, installation and commissioning. The companies listed in the Turbine column cover wind turbines, blades and towers. All companies listed have competency in design, construction, health & safety and training. Mainstream is highly confident that the overall tendering process represented industry best practice, as evidenced by comments made by GeoSea[1].

In order to maximise its knowledge of the underlying sub-contractor supply chain, Mainstream engaged extensively with potential contractors, through an open book approach to tendering and pricing of sub-contractors, materials and equipment. Although Mainstream must wrap its contracts into two or three "work packages" [2], this does not mean that Mainstream cannot actively engage with these contractors to push forward competitive solutions on these Tier 1 contractors.

Mainstream adopted a collaborative approach with its major contractors where the clear message was delivered that Neart cannot sustain utility pricing levels. This message has been underpinned by (A) the use of an open book approach to tendering and pricing of sub-contractors, materials and equipment, and (B) Mainstream sharing the Neart financial model with its Tier 1 contractors to prompt them to revisit their approach to material, equipment and sub-contractor tendering to secure more competitive prices.

2.1.1 Mainstream's Tender Process

Through consultation with Offshore Wind Consultants (**OWC**), a leading UK offshore wind consultant, tender documents were developed for bidding Tier 1 contractors. Contractors were provided with detailed information on the Neart site (as at November 2012) and asked to complete a comprehensive tender document focused on five main criteria which included[3]:

Technical:	Mainstream encouraged innovative technical proposals from (A) turbine suppliers to provide maximised power delivery, whilst at the same time complying with consent conditions and meeting strict delivery timetables, and (B) EPC contractors to provide effective foundation solutions to overcome challenges associated with water depths (c.50m) and sea-bed conditions.
Bankability and Costs:	The ability to raise project finance is dependent on the use of proven/certified components, techniques and designs in the construction of the wind farm (e.g. a requirement for any selected turbine was to be compliant with the IEC 61400 series of Wind Turbine Standards and to have demonstrated certification). The higher the bankability score, the lower the overall cost of project debt, a key driver in achieving a lower cost of energy. Detailed pricing proposals were requested from all contractors and provided in a format which enabled Mainstream to determine sub-categories of work, anticipated margins, contingency requirements, as well as areas for future improvement and cost-down initiatives.
Local Supply (and Sustainability):	Local content, with particular emphasis on Scotland, was established as an important element of all contracts to be awarded for the Project.

[redacted]

Health and Safety: Maintaining the health and safety at work of Mainstream's staff and any contractors and taking care of the environment are core values of Mainstream.

The weighting for each of the five criteria was communicated to the suppliers as follows:

1. Health, Safety and Environmental (10%);
2. **Technical (25%)**;
3. Bankability (30%);
4. **Local Content and Sustainability (15%)**; and
5. **Indicative Cost (20%)**.

2.1.2 Wind turbines

The wind turbine selection process has been underway since late 2012. Eleven Wind Turbine Generator (**WTG**) manufacturers[4] were approached as part of the initial tender process, and the world's leading manufacturers provided comprehensive responses, including extensive pricing estimates.

Mainstream's Turbine Supply evaluation summary outlines the exhaustive process Mainstream undertook to engage the supply chain[5]. Through the process, Siemens Wind emerged as the leading turbine manufacturer, offering a key balance between affordability, bankability and maturity. Mainstream took the decision in January 2014 to move into exclusive bi-lateral discussions with Siemens Wind, as a Tier 1 supplier, in respect of WTG supply to the Project[6]. [redacted]

As stated earlier, when Mainstream entered into bi-lateral discussions with all of its Tier 1 contractors, it was on the clear basis of contractor commitment to implement a comprehensive and open procurement strategy. The result will be to promote competition and find the best supply chain partners offering most competitive pricing for work packages[7]. That Siemens will meet this commitment is evidenced by its track record of delivering projects using a broadly sourced supply chain, particularly in the area of fabricated steel structures. Siemens has already engaged with at least three external suppliers across each of the following areas in relation to the Neart project:

Fabricated Steel Structures	O&M facilities	Ports
[redacted]	[redacted]	Port of Dundee - Forth Ports
[redacted]	[redacted]	Nigg Energy Park - Global Energy Solutions
[redacted]	[redacted]	ABLE Seaton Port - Able Ports

Table 2: Early Procurement, Siemens Wind

Economic efficiency (minimising logistic and weather related costs) dictate that certain functions must be conducted within a limited geographic range of the Neart facility. The requirement to maintain maximum competition via competitive tendering process in areas such as pre-construction facilities (Nigg, Able Seaton and Dundee) and Operations & Maintenance (**O&M**) ports [redacted]) is particularly important for the Project.

[redacted]

Exposing all parts of the supply chain, including the local supply chain, to tenders for large scale contracts will ensure best value for money is obtained for Neart. Any successful Port or O&M facility that emerges from this competitive process will be provided with a critically important reference project and legacy investment to help compete for and win further contracts during the delivery of the UK's Round 3 offshore wind projects and on European projects.

This wider supply chain benefit is a function of Neart's ability to deploy early, while having the qualities of a Round 3 project in terms of water depth (approximately 50m) and complexity (ground conditions), providing suppliers with valuable insight into a new competition phase.

2.1.3 Balance of Plant

In parallel to the WTG process, a balance of plant (**BOP**) selection process has been underway since late 2012. The initial tender was designed to bring forward the world's most experienced BOP and marine contractors into the Project.

During the response period, a number of contractors informed Mainstream of their intention to join together in providing a consortium / joint venture response. A total of nine comprehensive submissions were received in Q1 2013. Following an initial review of these by OWC and Mainstream's internal project team, seven contractors / consortia were invited for meetings in Q2 2013. An extract from Mainstream's BOP Supply evaluation summary outlines the exhaustive process undertaken by Mainstream to engage the supply chain[8].

In summer 2014, Mainstream entered into exclusive bi-lateral discussions with marine expert GeoSea on all foundation and marine installation work and a consortium of Siemens Transmission and Distribution Limited (**STDL**) / Prysmian consortium on the electrical package[9].

GeoSea is committed to delivering the most cost efficient foundation and marine installation available for Neart and as a result has already successfully completed the tender process on a number of components, drawing from across the European supply chain. The example listed in Table 4 below is in respect of jacket and pile fabrication and transport, which is the single biggest work package within GeoSea's scope of work (55% by value)[10]. All companies listed below have been contacted by GeoSea in Q3 2014 in respect of the Project.

[redacted]

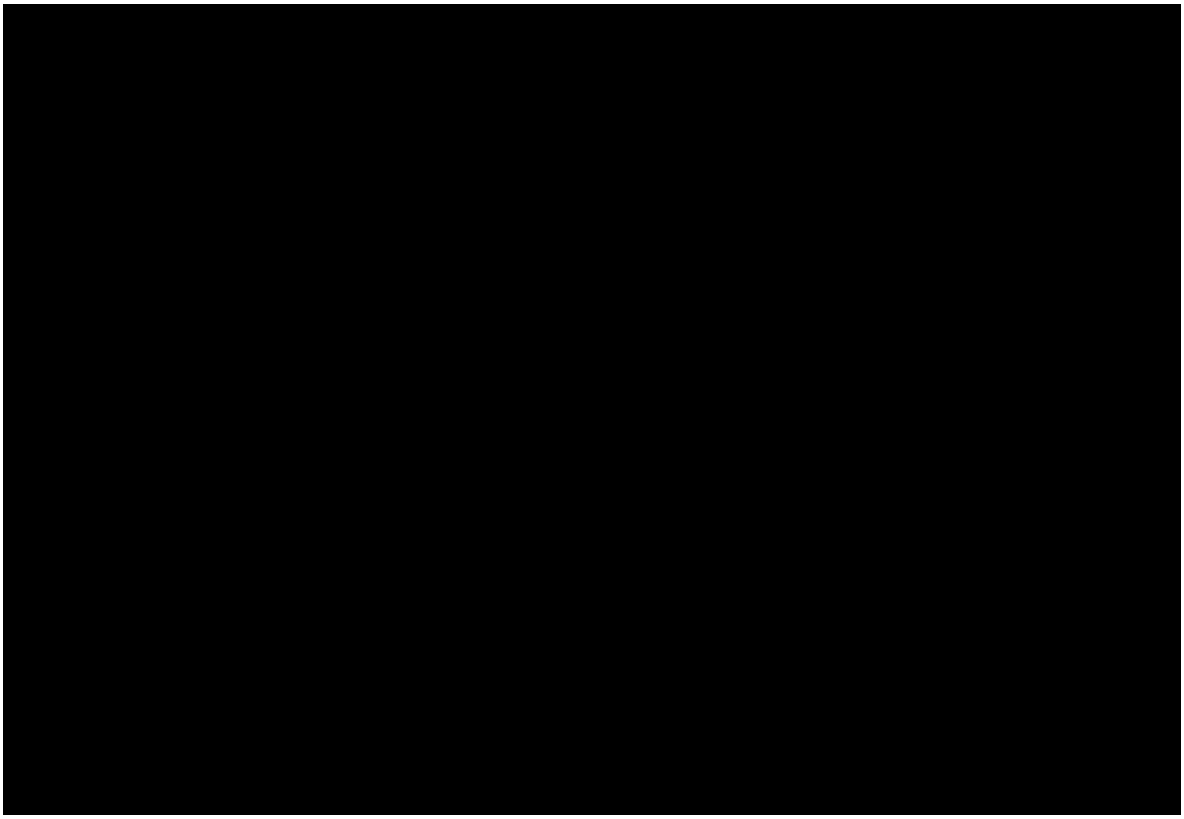

Table 3: Jacket/Pile Procurement, GeoSea

2.2 Supporting new entrants to the sector

Encourage broader supply chains by supporting new entrants to the sector

A significant proportion of the WTG and BOP contractors approached by Mainstream were making first forays into offshore wind (c.f. companies in italics listed in Table 1 above). The ratio of incumbents to new entrants in the WTG and BOP processes confirms the commitment by Mainstream to encouraging new entrant participation in this market. Similarly, a very high proportion of the fabricators approached by GeoSea are new entrants[11]. The ratios are summarised as follows:

Scope	Total Long-List	# New entrants (%)
WTG	11	6 (*55%*)
BOP	20	9 (45%)
GeoSea	17	8 (*47%*)

Table 4: New Entrant Ratios

In the three examples provided above, almost 1 of every 2 contractors is a new entrant. Set out below are three further examples in the areas of Ports/Harbours, Jacket Design and Jacket Supply/Fabrication.

2.2.1 Port and Harbour facilities

In order to secure a project office and potential load-out bases for Neart, GeoSea has visited 12 regional ports during 2014, including: [redacted] Although some of these ports have previously been utilised by the offshore wind sector, all of the ports are classified as new entrants given that none have any prior experience of loading out jacket structures in these volumes.

[redacted]

In order to maintain as much competition in the procurement process as possible and thus procure low CAPEX costs for Neart, GeoSea undertook the development of a floating storage solution for jackets, using large barges and novel fastening devices. This will ensure that ports which would otherwise be disqualified due to insufficient onshore laydown areas or suitable quay wall capacity can remain competitive with the larger ports on the long list and participate fully in the tender round. Once successfully deployed, this innovative storage method can be used to increase the number of ports who can qualify as load-out bases for jacket installation in other projects, bringing an increasingly competitive supply chain to the offshore market[12].

This GeoSea work builds on earlier work by Mainstream whereby Neart actively engaged with a number of ports and harbours, with no previous experience in the offshore wind sector, to give them the experience and knowledge they need to compete in the wider supply chain. As a result, not only can these facilities competently engage with GeoSea, but they can successfully engage with other developers and members of the offshore supply chain:

- ***Dunbar Harbour Trust***[13]***:*** Dunbar has identified Neart as the leading offshore development project in the context of engagement with ports. Due to the proactive work by Neart, Dunbar has made significant progress in the redevelopment plans for the harbour and their desire to co-locate indigenous fishing industry, commercial offshore wind O&M and a relocation of the RNLI lifeboat back to Dunbar; and
- ***Eyemouth Harbour***[14]***:*** Extensive engagement with Neart has enabled Eyemouth to attract grants to progress development plans to the harbour. Neart recognised Eyemouth Harbour as a new entrant to the market and based its bird survey vessel, the "Fleur de Lys", there.

Siemens Wind will use a local port base for storage, final assembly and early commissioning. As experts in offshore wind turbine deployment, they have conducted a comprehensive analysis of the port market. Of the three preferred port locations identified within Siemens analysis (Dundee, Able Seaton, Nigg):

[redacted]

In addition, Siemens will be required to construct new local O&M facilities to service the Project in the operational phase. In preparation for this work, Siemens Wind has carried out a comprehensive O&M facility port assessment study for its work on the Neart Project[15], which analysed the suitability of different port facilities within the required geographic range for readily accessing the wind farm.

2.2.2 Jacket Design

[redacted]

[redacted]

2.2.3 Jacket Fabrication

GeoSea has issued tenders for jacket fabrication and is seeking to encourage new entrants with previous experience of large jackets from the oil and gas sector, including [redacted]
By opening up the tender process to the more commercially developed oil and gas sector, GeoSea is able to leverage a wider pool of experience and therefore maintain competitive cost prices for Neart.

It is intended that the jackets to be used on Neart's offshore wind farm will be fabricated using a combination of two suppliers, with approximately 44 jackets being produced at a facility in the UK and the remaining 20 in mainland Europe. [redacted]

2.3 Improving awareness

Improve awareness of the commercial opportunities among both companies that currently supply to the relevant low carbon generation sector and those that have the capability to do so, but have not yet entered the market and have not yet reached critical mass.

Over 30x companies across the world participated in the initial tendering for each of the WTG and BOP work packages. This large number, when taken with the high ratio of new entrants, is evidence of the deliberate steps taken by Mainstream to promote this Project and maximise its awareness among the relevant contactor communities.

During the development stage, Neart has engaged with a large number of local and UK suppliers. This engagement has mainly focused on meetings, conference presentations, supply chain "**Meet the Buyer**" events, workshops, supplier site visits and organised tours of regions. These events are on-going and summarised below:

- Since 2010, Neart has attended 25x public community events, of which only 6x (*25%*) were statutory consultation events[16];
- In addition to the local events, Neart attended numerous conferences and supply chain events throughout the local area. Neart na Gaoithe has provided an update at the Scottish Renewables Offshore Wind and Supply Chain Conference every year since 2012 and a supply chain update at the Renewable UK Global Offshore Wind conference in 2014;
- Neart has worked with Enterprise Ireland to provide insight into Irish companies looking to get involved in the UK market and the Netherlands British Chamber of Commerce (**NBCC**) at the Renewable UK conferences to provide project updates and contacts;
- Scottish Enterprise[17] and Fife Council[18] have organised supply chain events and contract awareness events where Neart has provided insight in to both the Project and the industry;
- Neart has attended and pro-actively supported the East Coast Renewables venture between all the local development agencies on the East Coast (c.f. Annex 15 and Fife Council Letter);
- Mainstream conducted a regional roadshow chaired by Group COO and Offshore CEO, Andy Kinsella, with support from existing supply chain members, between 2011-2013. The objective was to

[redacted]

promote opportunities within offshore wind to local supply chains, with Neart acting as an entry point opportunity. Cities visited included Belfast, Dublin, Dundalk and Ballina (the latter in conjunction with the office of the Irish Premier, *An Taoiseach*);

- Neart and Scottish Enterprise have committed to a number of future 'Meet the Buyer' events, including 3 targeted events in Dundee, Fife and East Lothian[19]. This will involve Neart, in conjunction with Tier 1 suppliers, providing face-to-face time with suppliers. Scottish Enterprise, with the aid of local development agencies (Fife Council) will organise and host these events, which are due in Q1 2015; and
- Neart will bring a more targeted 'Meet the Buyer' event to both the fishing community and the ex-military community to promote diversification and re-training in indigenous local industries. These events will be organised in the same timeframe as the other 'Meet the Buyer' events in Q1 2015.

2.4 Removing barriers to entry for new suppliers

Identify and remove barriers to entry for new supply chain companies, where these are within the scope of the project

In addition to 'Meet the Buyer' events, the Project has also developed a comprehensive supply chain database, facilitated the formation of consortia among the Tier 1 providers, and supported the Siemens supply chain management programme. These are described in further detail below.

2.4.1 Supply Chain Database

The Project website (www.neartnagaoithe.com) provides potential suppliers with an option to register on the site to have updated information on the Neart project emailed directly to the suppliers, as well as an option to register, as an available supplier, on the official Neart na Gaoithe database (www.nngsupplierdatabase.com). Additionally, when any member of the Project team and /or Mainstream Group attends, presents or hosts an event where engagement with the supply chain is expected, there are dedicated iPads available for supplier registration. The registration process allows for the supply chain to upload any relevant information in pdf format. A copy of the current database and the supply chain database analysis is attached as an Annex[20].

To date, the Supply Chain Database has been shared with all Tier 1 contractors working on the Project, with the result that supply chain companies not in a position to contract directly with Neart na Gaoithe are able to engage with the appropriate Tier 1 contractors directly. This has significantly opened up competition for suppliers at the Tier 2 and Tier 3 level, increasing the competitive procurement process and as a result, driving down costs for Neart. Additionally, as a result of allowing access to this database for Tier 1 contractors during the tender process, companies who are seeking to enter the offshore market have been able to receive exposure to major contractors within the sector, contacts which can be revisited for other projects in the future.

The supply chain database is refreshed regularly and sent to Neart's Tier 1 contractors. Mainstream will provide the final database to Scottish Enterprise for ongoing maintenance and use on other offshore wind projects once the final supply chain appointments are completed on Neart.

[redacted]

2.4.2 Siemens Global Supply Chain Management Programme

While Siemens design most of their components in-house, and manufacture some components, a significant proportion of the Siemens end product (Wind Turbines, onshore and offshore electrical components) are sourced externally. Siemens Global Supply Chain Management Programme is committed to supporting the sourcing, development and management of existing and new suppliers to support the Neart project. Key sourcing criteria will focus on the technical, commercial and logistical capabilities of companies and Siemens will actively support local businesses seeking to overcome barriers to enter the supply chain by making the relevant criteria publically available where possible.

Siemens is open to the selection and development of local suppliers or subcontractors for the Neart project with consideration to the quality and price criteria. This approach is fully in line with Siemens focus on improvement of the business case and competitiveness of its offered solution. Siemens will also assist, co-ordinate and facilitate the introduction of new, lower tier suppliers to Siemens Tier 2 suppliers on Neart, further opening up a competitive supply chain across the offshore wind sector[21].

In line with the mandate set out by Mainstream in its tender process, Siemens has committed to maximize the supply of locally sourced parts and will competitively source up to 14,000 component parts (from machine oil to electrical components parts) for the Neart Project.

2.4.3 Consortia

By opening up the BOP tender process to consortia responses, Mainstream ensured that the barrier to entry which often arises due to projects being too large for any single contractor's balance sheet did not arise in Neart. Mainstream encouraged the formation of, and gave due consideration to, all consortia responses. Without the consortium option, many of the BOP contractors who engaged in Mainstream's BOP tender process would otherwise have exited the procurement process at its initial stages, undermining the competitiveness which had been achieved.

In certain cases, consortia that came together for the Neart tender process, but who were unsuccessful, have maintained relationships and continue to work together in bidding for other offshore wind projects. In summary, best practice from the Neart competitive tendering process has increased the supply of available contractors for European offshore wind farm procurement processes including UK Round 3 projects.

2.5 Best practice

Share best practice and lessons learnt

2.5.1 Development Agencies

To enhance its access to the local supply chain and encourage the sharing of best practice methodologies, Neart engaged with Scottish Enterprise throughout the development phase of the Project and more recently through the secondment of a dedicated Scottish Enterprise employee, Jamie McLeod in January 2014[22]. This secondment has offered Neart a unique insight into the wider local supply chain. It has also provided Scottish Enterprise with deep insights into the Project and the offshore sector.

The Scottish Enterprise secondment has provided an important project liaison between Neart, Scottish Enterprise and other stakeholder groups such as:

- Infrastructure team, on O&M port and Construction port issues;

[redacted]

- Scottish Manufacturing Advisory Service (**SMAS**), on future supply chain development workshops drawing on best practice from other sectors where appropriate;
- Skills Development Scotland, on Energy sector skills initiatives, support mechanisms;
- Scottish Development International, on potential supply chain inward investment and grant support to close identified gaps; and
- [redacted]

2.5.2 Mainstream Best Practice

The responses from the initial tender process were used by Mainstream to further refine the Project's design envelope, thereby helping to de-risk the consenting process and advance the EPC procurement strategy. Through engagement with the three final shortlisted contractors, Mainstream took the brave step of early engagement with leading designers so that initial design work could be started in parallel with the BOP selection process. This had the effect of providing the final grouping of Tier 1 contractors with access to leading design development work, which in turn fed-back into procurement processes.

The approach described above has enabled Mainstream to establish a key link between the custom design for building the Project and contractor selection. Through this strategy, Neart successfully shared design information and data from the development stages of the Project with the two shortlisted BOP suppliers, including innovative geotechnical surveys conducted at the site by Fugro Geotechnical Consulting. This approach achieved the three primary goals of:

- Ensuring that the final BOP contractor selection was made on the basis of a 'live' engagement, enabling contractors to come forward with fixed price proposals;
- Providing the shortlisted parties with an incentive to come forward with additional innovations and construction value add/value engineering solutions (**VAVE**) while in the tender process; and
- Giving exposure to the shortlisted companies to site/ground conditions representative of UK Round 3 offshore in a UK Round 2 setting, thereby starting the innovation process for all UK Round 3 in advance.

The innovative parallel path and early engagement strategies described above further enhanced the bankability of Neart.

Competition Summary:

- Through Mainstream's tendering process, over 31x Tier 1 turbine and BOP contractors were approached. A large proportion of these were new entrants (c.50%). Mainstream's choice of Siemens Wind, STDL/Prysmian and GeoSea is evidence that a world leading consortium with best in class execution capability can be obtained through competitive tendering processes where price/cost is identified as the key driver;
- Through the Heads of Terms agreed with the main contractors, Mainstream has ensured that broad procurement strategies will be followed for all major work packages. GeoSea's extensive contact with fabricators, both existing and new entrants, is evidence of this; and
- As a first mover in Scottish waters, Neart is ideally placed to kick-start a fresh wave of Port/Harbour infrastructure development in the North East.

3 Innovation

Innovation is one of the six core values identified when Mainstream was formed in 2008 and is a metric which all staff and projects are measured against annually[23]. Due to the project finance solution targeted for Neart, it has been imperative for Mainstream to strike a balance between innovation and its ability to satisfy lenders that all project risk is correctly quantified and properly managed.

3.1 Technological development

Turbines

3.1.1 7MW Direct Drive Turbines

[redacted]

Successful installation and commissioning of the 7MW Direct Drive turbines at Neart will cement their commercial viability in the wider offshore market. Neart would represent a major break-through in two respects: (i [redacted] and (ii) by using a non-recourse project finance structure at the construction stage.

The 7MW Direct Drive turbine has 50% fewer moving parts than comparable geared machines [redacted] Replacing the main shaft, gearbox and high-speed generator with only a low-speed generator eliminates two-thirds of the conventional drive train arrangement. As a result, the number of rotating and wear-prone parts is vastly reduced. These features of the 7MW platform will have a significant positive impact on construction and O&M costs on Neart, and hence will significantly reduce the levelised cost of energy (**LCOE**).

The newly developed rotor blades combine lightness and strength through single-cast Siemens IntegralBlade production. The 7MW turbine will be fully pre-commissioned onshore from Neart, leaving only final connection to be performed after installation at the offshore Project site. This approach significantly lowers the installation risk, further helping to drive down project and consumer cost. Neart will therefore lead the way in establishing a fully pre-commissioned turbine as the new installation standard for offshore wind farms, also benefiting the wider industry. This combination of robustness and low weight significantly reduces infrastructure, installation and servicing costs and boosts lifetime energy output.

Following Mainstream's decision to move into partnership for 7MW turbines, Siemens indicated its intention to establish a UK manufacturing facility for Direct Drive turbines on the site of the Humber Estuary in March 2014. The Hull project remains on schedule for a 2016 completion date, in line with expected contract and project requirements. [redacted]:

- A project execution site located at Alexandra Dock;
- [redacted]
- [redacted]
- A Logistics Distribution Centre (**LDC**) supporting service activities.

[redacted]

[redacted]

Offshore substations

3.1.2 Offshore Transmission Module

The Neart project will be truly innovative by being the first commercial deployment of an offshore wind farm that does not include a dedicated offshore substation. This is achievable through Siemens Offshore Transmission Module (**OTM**), proposed by Siemens Transmission and Distribution Limited (**STDL**), which will completely remove the need for a dedicated offshore transmission platform[26]. This will be achieved through the extension of several offshore wind turbine platforms, on which the transmission equipment (high voltage switchgear and transformers) would be placed.

The main impacts of this ground-breaking OTM innovation at Neart are three-fold:

- By co-locating the offshore substation equipment on extended wind turbine platforms, STDL expects to be able to save 30% for the Neart offshore substation system CAPEX costs[27];
- Integration of the offshore transmission equipment onto the wind turbine platforms will reduce the operating costs requirements at Neart by 10-15%. This is achieved through the reduction of ancillary equipment, the biggest single driver of O&M costs, and through reduction in corrosion and paint repairs by 50%; and
- In addition to CAPEX and OPEX savings, Neart expects to achieve a reduction in the construction programme, through savings in offshore activities and installation durations. These will further reduce the levelised cost of energy (**LCOE**) by lowering project financing cost.

At present, only a limited number of fabricators and installers are able to manufacture and install dedicated offshore substation structures. Dedicated offshore substations are currently the only option for offshore wind farms and require exceptionally large vessels (crane capacity of approximately 2,500 tonnes) at significant cost. This limited supply chain capability is a factor in the high associated costs.

An OTM solution requires a much lower crane capacity and as such will increase supply chain alternatives acting as a catalyst for further cost reductions. The early commercial deployment of OTM on Neart, as the

[redacted]

platform for OTM, will open up the supply chain to smaller, more diversified entrants to the sector, fostering competition and ultimately delivering lower cost solutions for the wider wind industry.

Wind Measurement

3.1.3 FLiDAR

Neart is a landmark project in the history of wind measurement in the offshore wind sector. This is due to the role it has played in facilitating the commercial validation of floating LiDAR (**FLiDAR**) technology in the North Sea, and also by the expected use of the technology in a first non-recourse project financing (all financings within offshore wind to date have relied on met mast data as the primary data source). At the heart of this innovative achievement was the initial decision by Mainstream to forego a traditional met mast solution for Neart. A fixed met mast on Neart would have proven onerous due to the high one-off installation costs (£15-30m), difficult deployment and high O&M cost profile.

FLiDAR represents a significant achievement for the Neart project in the area of innovation. It is also a demonstration of how innovation within supply chain partnerships, in this instance due to the validation and data provision role played by the NAREC offshore met mast, can produce game changing results for the wider sector. These points are evidenced in the letter of support provided by FLiDAR[28]. All future offshore projects choosing a floating LiDAR solution as a baseline wind measurement system will now benefit from a saving of at least £20m and avoid 24 months of met-mast related development work.

The FLiDAR system consists of state-of-the-art measurement equipment, including a buoy adapted Leosphere LiDAR, mounted on a standard marine buoy. The FLiDAR is powered by its own renewable energy system comprising solar photovoltaic and wind power technology. The technology is designed to capture valuable hub height wind resource data in the harshest conditions. Mainstream, in parallel to work by FLiDAR, engaged all the leading consultants in wind analysis (including DNV GL and Sgurr energy), to ensure the technology and the data acquired at Neart is acceptable for project finance both at Neart and for future projects.

As a member of the Offshore Wind Accelerator (**OWA**), Mainstream had access to FLiDAR used at Gwynt y Mor in a pilot/demonstration capacity. Mainstream concluded that this innovative technology could be deployed commercially, recognising economies of scale for both costs and risk, and embarked on a procurement campaign.

Mainstream invited all floating LiDAR manufacturers and service providers to provide information on their solutions including indicative prices and schedules. An initial tender (pre-qualification questionnaire, **PQQ**) issued to the following seven companies: [redacted]. The assessment of the tender documentation resulted in a shortlist of two solutions: [redacted] with a final award being made to FLiDAR following completion of the Mainstream assessment.

The deployment methodology required three month validation adjacent to a fixed met mast (NAREC), followed by on site measurements for six months and concluded with a further month of validation (NAREC). Independent confirmation from DNV GL proves that the Neart FLiDAR device has surpassed all KPI acceptance criteria as detailed in the Carbon Trust OWA Roadmap for commercial acceptance[29].

The key findings of the report:

- The validation trial has been successfully completed with best practice criteria surpassed for accuracy and reliability / data availability KPIs;

[redacted]

- There is no discernable sensitivity in wind speed accuracy to the met ocean conditions experienced at the validation met mast, NAREC; and
- The FLiDAR device can now be used as an independent source of onsite wind data at the Neart site or in support of wind flow modelling.

The primary wider impacts on the supply chain by the FLiDAR successes at Neart are two-fold:

- The development costs related to wind measurement reduced by 90% at Neart (approximately [redacted] a saving which can be captured by any developer using FLiDAR[30]. FLiDAR has confirmed the very positive impact the Neart project has had on its business. As the onus for developers to conduct quicker and cheaper development campaigns is greater in a CFD context due to the risks inherent in the allocation round format, the significance of the time and money savings now available to all developers by using FLiDAR cannot be overstated; and

- As a direct result of the Neart Na Gaoithe project, the successful deployment of floating lidar technology has enabled DNV GL to independently validate the results and move the FLiDAR in to Stage 2 of the Carbon Trust OWA Roadmap for commercial acceptance[31]. Stage 2 was reached in September 2014, meaning that the system can be deployed on all offshore sites as a stand-alone source of wind data (or to supplement fixed offshore met masts). This will deliver cost reductions to all future offshore wind farm developments.

3.2 Innovative or new installation methods

Foundations[32]

3.2.1 Drive-Drill-Drive

Early design work for the Neart project confirmed that jacket foundations supported on piles were the most economical foundation concept for the site. The ground conditions at Neart are challenging for the installation of piles. The challenge arises from the presence of hard bedrock of variable strength at a shallow depth below sea-bed that must be penetrated by the piles. The current default pile installation process for offshore wind uses an impact hammer. This is not suitable for use at Neart (risk of refusal) and has required GeoSea to innovate and look for an alternative piling solution, called the 'drive-drill-drive' (**DDD**) technique.

While this alternative DDD technique has been used for monopile foundations, it has never been deployed with jacket structures. The load profiles of monopile and jacket foundations differ significantly, and therefore the industry regards the use of DDD for jackets as completely unproven. GeoSea will now look to work with external design and engineering firms to ensure that Neart's DDD process will be properly certified by a certification authority.

To support the certification process, Mainstream, GeoSea and a certifying body have already embarked on a series of innovative onshore pile tests in ground conditions similar to those at the Neart site. The onshore site is located close to Edinburgh and successful completion of the tests will enable DDD certification and use on the Project. It will also enable non-recourse finance (project debt) to flow into the project, lower capital costs and ultimately costs to consumers. [redacted] Lastly, certification and wider promotion of the process through tendering will ensure these processes can be quickly deployed in other offshore projects with similar characteristics.

[redacted]

As a second potential solution GeoSea is developing a novel technique based on grouted driven piles, already in use in port infrastructure by the DEME Group (of which GeoSea is member), but never in offshore wind. GeoSea is in active dialogue with a range of new supply chain entrants in the UK and Europe to determine which are best placed to provide the DDD and grouted pile solutions. Many come from the oil and gas sector, where synergies exist. Deployment of these new technologies at scale on Neart will be world first, triggering wider deployment in offshore and provide competitive advantage to the supply chain teams involved.

3.2.2 3-legged jackets

The deep water depths at Neart will require bigger jackets than have been deployed to date at scale in the offshore wind sector. This presents a further challenge and opportunity to innovate with GeoSea asking fabrication yards to come forward to GeoSea with new methods and equipment in respect of:

- Up-righting of jackets (following their fabrication in a horizontal position); and
- Transportation and storage of jackets.

Four-legged jackets are the default solution for use in offshore wind projects. GeoSea has concluded that a three-legged jacket would reduce the fabrication costs by approximately 5% and thereby provides the most cost effective solution for the Project. Neart will represent the deepest application of three-legged jackets in offshore wind to date worldwide. A further benefit is the consequential reduction in the numbers of piles required by 25% and an associated saving on piling costs. Once executed successfully in deeper waters at Neart, the use of 3-legged jackets will reduce CAPEX costs of Round 3 and Scottish Waters projects across the offshore wind market.

3.3 Research and Development

Research and development, including links to universities and any examples of testing and demonstration

3.3.1 OWA

The Offshore Wind Accelerator (**OWA**) is the Carbon Trust's flagship collaborative R&D programme that targets support of innovation to reduce the levellised cost of offshore wind by 10%. Established in 2008, the OWA is a joint industry project, involving offshore wind developers who hold 77% (36GW) of the UK's licensed capacity. Mainstream is the only independent /non-utility offshore wind farm developer in the OWA. Since 2008, the OWA has grown from 5x developers considering the feasibility of innovations to 9x developers working collaboratively with over 550 companies throughout the supply chain to bring the best ideas to market in time to make an impact on the cost of UK Round 3 and Scottish wind farms.

Mainstream has played a leading role in driving the OWA forward. Through Mainstream's membership the following three R&D projects have had a direct and positive impact on the design of and innovations planned for the Neart Project:

- ***66kV Inter Array Cable:*** Validation studies completed by the OWA in period 2011-2013 have identified that adoption of inter-array cables at an operating voltage of 66kV rather the conventional 33kV could reduce wind farm electrical losses by 75%. The OWA has awarded contracts to 3 cable manufacturers including Neart's Tier 1 supplier for cable installation, Prysmian, to manufacture 66kV cables for extended testing. Neart will adopt 66kV inter array cables subject to the validation testing success;
- ***Layout Optimisation:*** The Project aims to maximise wind farm output by designing layouts that minimise interference between adjacent turbines. Data from the OWA layout project has been used in the wakes model for Neart and influenced the final consenting layout submitted to the Scottish consenting authorities in 2013; and

- ***Improving O&M Access:*** It was recognised by OWA that improvements in accessibility to turbines during adverse weather conditions could have a significant impact on turbine availability and in turn on the levellised cost of energy. O&M vessel selection has been a key challenge for existing operational wind farms and the OWA has developed a vessel performance metrics template that promises to significantly improve the selection process for O&M vessels. Siemens has adopted this performance metric basis for the Neart O&M contracts.

Other Mainstream-led projects supported by the OWA have had significant impact on Neart na Gaoithe. These are the FLiDAR project and the DDD project.

3.3.2 Turbines

The commercial deployment of the 7MW Direct Drive turbines on Neart has been fundamentally assisted by the research conducted at Siemens' Direct Drive Generators Centre of Competence at Sheffield University. This centre and employs 8x full time staff in the UK, 6x PhD students and 2x Research Associates. The Centre, which allows for the design and manufacture of more robust, cost effective generator solutions for both on and offshore wind farms, was integral to the development of the 7MW Direct Drive turbines used at Neart.

Additionally, the Centre will utilise and analyse key data and findings from the first large-scale manufacturing and deployment of the 7MW Direct Drive turbines at Neart, which will feed into the technological development of new generation Direct Drive capacity. This will drive the continued development of wind turbine technology at Siemens, which will create further competition within the wind-turbine market and drive down costs for consumers.

3.3.3 Geotechnical Investigations

Intrusive geotechnical investigations account for up to 40-50% of development costs. Mainstream, through its work with innovative non-intrusive geotech contractor, PanGeo, successfully enabled the testing of an acoustic corer on Neart. This was the first deployment in offshore wind by PanGeo and integral to the company's success in the industry. Acoustic coring has the potential to reduce the cost of all geotechnical investigations by 25-30%.

3.4 Procurement and Contracting Practices

Allowing less established products or processes to win part of a contract or co-investments in the supply chain which will reduce or manage the allocation of risk in such a way that it supports new entrants or less established suppliers.

[redacted]

[redacted]

3.5 Best practice

Share best practice and lessons learnt

3.5.1 Levelised Cost of Energy (LCoE)

Driving down the levelised cost of wind energy is integral to the Neart na Gaoithe project. New innovation, along with identifying and eliminating problems experienced on previous offshore wind farm developments, will help to steadily reduce the Levelised Cost of Energy (**LCOE**) produced by the offshore wind market.

Siemens has drawn on knowledge and lessons learnt from previous onshore and offshore wind projects to capture potential business case and LCOE improvements for the Neart project[34].

3.5.2 Customer Support Centre

In order to meet the growth of offshore service business and develop its capability to meet the complex needs of far shore service contracts, such as Neart, Siemens has established a UK Customer Support Centre (**CSC**), which will be a central hub to ensure the thorough and safe planning and execution of all wind farm activities. This coordination will increase safety, reduce environmental impact and improve wind farm energy production.

[redacted]

The CSC will use best practice and lessons learnt from previous projects to consolidate and expand service portfolio in a dedicated command and control centre providing visibility of every activity critical to the safe installation and service of a wind farm. The emphasis is on planning all work activity prior to the dispatch of vessels, spare parts and technicians. Once mobilised, the CSC will provide support for technicians and capture information on the work executed providing a feedback loop to operational planning. The service will be available 24 hours a day, 365 days a year and is expected to be delivered in time for Neart.

Innovation summary:

- Deployment of the new 7MW direct-drive turbine, the new offshore transmission module and three legged jackets at scale by Neart, will give Neart a sector leading LCOE and represent a new frontier of innovation for larger wind farms deployed in deeper waters;
- The successful introduction of FLiDAR technology into the sector via Neart will enable all future projects to be developed without the cost, construction and delay risks associated with traditional met-mast structures; and
- The risk management / risk share structures to be adopted with contractors as part of Neart's non-recourse project finance structure, and the breaking up of utility dominance of offshore asset management through successful launch of [redacted], will together introduce best practice risk management and more transparent cost optimization into the offshore wind sector for all future projects. Operational excellence will force lifecycle costs to fall.

4. Skills

The Neart Project is committed to continuing the development and maintenance of a skilled, reliable and long term workforce in the offshore wind farm industry in collaboration with its major suppliers for the 25 year operational life of the Neart Project.

4.1 Skills currently in place

An assessment of whether these skills are currently in place and what, if any, gaps there are

4.1.1 Development Skills

Core Development

Over the six years of its development of the Project, Mainstream has built up a significant pool of skilled workers. As of Q3 2014, Mainstream has more than 25 full time employees deployed on the Project. Accreditation from The Irish Institute of Engineers was awarded to Mainstream in 2012 for its continuous professional development (**CPD**) programme[35].

The success of the Mainstream entrepreneurial and engineering skill sets are now apparent in the UK's offshore wind sector. In the case of Neart, and despite being a new entrant, it is one of only 3x projects successfully developed from an initial award of 10x projects in the Scottish Territorial Waters Round (2008/2009). This is due to the strength of the development team assembled on Neart.

While the core skill sets for Neart were sourced from Mainstream, when the Neart Project team set up its project office in Glasgow, it set about training and developing newly recruited employees into a stand-alone team of experienced environmentalists, wind analysts and engineers. Today, this expanded team can not only serve the Project, but also the wider UK offshore wind industry. For example, some of Mainstream's employees have now set up their own supply chain businesses to service Neart and other players in the UK renewables energy sector. Mainstream has supported this entrepreneurial development by allowing them to successfully compete to be part of the Neart Project's contractor supply chain.

Environmental consent

Throughout the design and development phase of the Neart project, Mainstream has actively engaged with emerging players throughout the marine sector, building a more robust, diverse and competitive supply chain. The ultimate rationale for so doing has been to drive down costs.

Mainstream initially commissioned Fugro EMU in 2008 to deliver offshore environmental consenting services and has continued this relationship through the EIA process and with ongoing support on all aspects of marine environmental and consenting works. This relationship has resulted in the following benefits for Neart, as well as providing Fugro with a platform to successfully target the offshore sector more broadly:

- Neart was the first offshore wind farm project undertaken by Fugro EMU to utilise Survey, Consultancy and Laboratory capabilities to enable a coordinated and informed service delivery across the Project;
- Neart's offshore environmental consenting programme has been supported by a core team of 2-3 dedicated consultants on a permanent basis since 2008, supported by a wider team of 25 environmental and GIS consultants based in Southampton and Edinburgh; and

[redacted]

- During the consent and preparation phase for Neart (2009-2012) the Project represented approximately 10% of business for Fugro EMU, with the offshore wind sector accounting for approximately 70% of all business during the same period.

The skills developed and refined through engagement on Neart have been integral to Fugro EMU winning other contracts (e.g. [redacted]

Mainstream has worked to develop skills and promote a greater pool of expertise in ports and harbours by actively engaging with Dunbar and Eyemouth, two ports with no previous experience in the sector. By locating the Neart bird survey vessel, the "Fleur de Lys", at Eyemouth Harbour when 'off-site', and through knowledge transfer interactions with Eyemouth, the Neart project has provided these harbours with knowledge, information and a network of contacts that has allowed them to successfully engage with other developers and members of the offshore supply chain[37].

Neart has been instrumental in the development of new environmental skills and techniques during the development phase, resulting in the creation of new and lasting skills among suppliers. These include:

- **Long term Bird Monitoring**: Working with Cork Ecology, Natural Research Projects and St Andrews University's Centre for Research into Ecological and Environmental Modelling (**CREEM**), Neart used the ground-breaking before-and-after gradient bird assessment approach which provides the foundation for key post construction monitoring programmes. The skills deployed in this CREEM monitoring scheme are completely novel. Neart has committed to undertake 5 years of post-construction monitoring, which will significantly improve industry understanding of the impact of wind turbines on key bird species; and

- **Bird Tagging:** Neart worked with the Centre for Ecology and Hydrology (**CEH**), part of the Natural Environmental Research Council, to develop a new bird tagging program that formed a key component of the Project's environmental impact assessment. This revolutionary program will provide evidence for changes in bird behaviour before and after the construction of an offshore wind farm. The new skills required for effective deployment of the tagging campaign will be transferable to all other offshore projects. NNG contributed the data from this tagging for strategic population modelling, undertaken by CEH for Marine Scotland, and was an active participant in the steering group for this strategic work.

Neart na Gaoithe has to date worked with a cross sector team comprising academics, consultants, developers, regulators and nature conservation bodies. Mainstream will build on this experience by forming a framework system with partner companies to allow for a more comprehensive understanding of cumulative impacts of multiple projects on marine mammal populations in UK and European waters. The new environmental skills developed as this framework is implemented will greatly assist the consenting process for current and future offshore wind, wave and tidal projects.

4.1.2 Construction

WTG manufacturing and installation

Through its choice of Tier 1 contractors, Mainstream has available to it an extensive UK and international workforce to support the efficient construction and installation of Neart. Siemens already employs 2,000 people in the UK win in activities that include turbines, grid connections and life cycle activities. Siemens Services alone employs 850x people in its main offices at Newcastle. Prysmian can draw from a pool of 19,000 employees worldwide and 17 research and development centres to support its project work on Neart, and GeoSea is supported by DEME's 4,300 strong workforce.

[redacted]

4.1.3 O&M

Siemens Energy Services, based in the UK, provides a wide range of innovative solutions for the Service, Maintenance and Monitoring of Siemens equipped Wind Farms. In addition to the general staffing levels, Siemens Services confirms that Neart will directly create approximately 60x additional and long term sustainable jobs for the 25 year operational life of the project[38], making a direct and significant contribution to skilled workers within the offshore O&M sector.

4.2 Investment in skills and training

A set of actions that will provide investment in skills and training in order to meet the future needs of the Project. These could be actions that have been taken in the past or are planned for the future.

4.2.1 Design & Structuring

Engineering - GeoSea

GeoSea, as part of their scope of work, will build a full scale mock-up of the foundation – wind turbine tower interface at the onshore fabrication yard that will be used on the Neart offshore wind farm, at least six months before offshore installation commences. This mock-up will provide an opportunity to critically examine the key design interface, and permit offshore technicians a unique opportunity to examine and walk-around the structure platform where they will work during the operations phase.

The demonstration (mock-up) project will play a key role in finalising design details and will enhance safety for the operations phase. This will be the first offsite training facility designed specifically for the 3 legged jacket which, once successfully deployed at Neart, can be used for future offshore wind projects. Geosea anticipates that approximately 10x engineers, 4x HSE persons, 10x subcontracted staff, as well as Siemens personnel to participate in training on the site.

Engineering - Mainstream

Since award of an exclusivity agreement for the site in 2009, Neart has provided key on-the-job training in offshore engineering design, construction and contracting skills for Mainstream's engineers. This has taken place through the extensive survey phases of the Project, as well as engagement with experienced offshore contractors and consultants.

At present, the Neart project team includes 8x Chartered Engineers and 10x Graduate Engineers, who all follow individual Performance Objective programmes, reviewed annually. Mainstream also indirectly supports in excess of 50x engineers at engineering consultant organisations who work part-time on Neart. The team is envisaged to expand significantly as the Project moves towards the construction phase. Mainstream maintains close links with university organisations, in particular University College Dublin, who have developed specialist offshore engineering skills through direct involvement on Neart[39].

4.2.2 Construction

WTG manufacturing and installation

As a direct result of securing an exclusive bi-lateral agreement on Neart, [redacted]

- This includes the creation of approximately 500 jobs during the execution phase of the Project; and

[redacted]

- The manufacturing and deployment of the [redacted] (64x) 7MW turbines at the Hull facility for Neart, which will support the creation of several hundred further jobs in the construction industry at fabrication yards, as well as for the required onshore civil works.

Siemens has committed to establishing a pre-assembly facility exclusively for Neart at a local facility, [redacted] nautical miles from the wind farm site, as advised in the main response to the tender. This is a significant commitment, which will see the deployment of:

- Approximately 170 full time employees (**FTEs**) over the period of installation (with approximately 75 involved in pre-assembly onshore and the remainder being involved in shipping and installation activities offshore[41]); and
- A seasoned team to engage with the supply chain on Round 3 and Scottish Water projects, given that Neart will be the first to execute 7MW direct drive turbines.

Siemens Power Transmission (**STDL**) has invested heavily in recent years in a new engineering facility and also in recruiting heavily for high value, high quality engineering and project delivery resources to support the creation of its interconnection Centre of Excellence in Manchester. This recruitment includes both young engineers and experienced staff. Specifically on Neart:

- STDL will employ 80 specialist engineers to carry out the execution phase of the Project; and
- Post Project, these engineers, including some of the first trained to develop and execute the revolutionary Offshore Transmission Module, will be able to use their skills and lessons learnt from the Neart project on future offshore wind developments.

In addition, STDL has committed to train its staff for Neart in its £9 million state-of-the-art training facility in Newcastle. STDL believes that the Neart Project gives STDL the critical mass it requires for investment in the Renewable Energy Engineering Centre (**REEC**) and associated resources and the promotion of long term O&M skills for the OTM at RECC.

Recognising the need to provide ongoing investment in skills and training, Siemens continues to invest heavily in bringing in apprentices into the Offshore Wind sector as a key part of their resource and talent strategy. Siemens Wind is already exploring the opportunities for further apprentice intake linked to the Direct Drive manufacturing facilities in Hull, and are engaged with local stakeholders and training providers on these opportunities. Siemens has confirmed that up to 20x apprenticeships will directly be attributed to their involvement on Neart given the decision to deploy a new Direct Drive technology (7MW).

As part of the Power Academy, Siemens Wind also offer a series of both summer internships as well as year-long internship programmes for those who are on a sabbatical from business or as part of a degree programme. These internships provide young people with an opportunity to be exposed to various facets of our business. As a direct result of their involvement on Neart, 3x graduates per annum for 5 years will be taken on by Siemens during the construction phase.

Delivering some of the most innovative offshore wind projects currently within the market, such as the delivery and installation of 7MW turbines and the Offshore Transformer Module (**OTM**), the Neart project will provide a direct and significant opportunity for graduates to gain experience in the most cutting edge and innovative parts of the offshore wind market.

Lastly, a subsidiary of the DEME group (Dredging International N.V.) has recently opened an office in London's Canary Wharf area. One purpose of this office is to support the Neart project. Following any decision to

[redacted]

deploy GeoSea's [redacted] additional staff would be introduced to work from this newly established London hub.

4.2.3 O&M

In preparation for further growth in offshore wind projects initiated by Neart, Siemens plan to develop the existing Newcastle upon Tyne Training School by installing a fully operational nacelle of the very latest Direct Drive wind turbine technology, and other associated training equipment. This will enable current and future UK service technicians and apprentices to be trained to meet the huge forecasted growth in demand on this new equipment and its associated skills for maintenance.

This investment will increase the number of training staff based permanently in the Training Centre, but in addition to this, will see hundreds of Service Technicians coming to the region annually for first-time and refresher training. Mainstream's decision to select Siemens 7MW direct drive technology for the Neart has resulted in Siemens' plan to extend the existing training facility and increase the requirement for training staff to the benefit of the wider offshore energy sector.

4.2.4 Services

Finance/Services

Mainstream recently enhanced its project finance team by recruiting three (3) individuals to specifically meet the future financing needs of the Neart project. Unique skills are required to secure a 450MW offshore power purchase agreement, to negotiate bankable WTG and BOP (EPC) contracts and to bring the project to financial close. Mainstream has augmented the Neart team's skill set by recruiting a senior financier with direct experience of securing similar non-recourse EIB debt guaranteed by commercial banks. The project finance approach requires Neart to appoint owner and lender engineer teams[42]. The skills required in these firms to provide the necessary diligence reports to support a financial close process are novel in terms of risk analysis techniques and being developed for the first time in the UK.

Separately, Neart will continue to employ unique practices in structuring matters to support its project finance strategy. These include the use of a ring-fenced special purpose vehicle from the outset, which will drive down execution costs associated with financial investment decisions and the introduction of new equity partners. Mainstream partnered with Scottish law firm Shepherd & Wedderburn **(S&W)** in advising on all consenting and structuring matters. The establishment of Neart S&W's engagement on Neart marked the start of the firm's significant investment in the market.

S&W now employs approximately 50x full-time fee earners on offshore projects for all or a significant portion of their time, of which 45x have worked and gained significant experience on Neart. The firm has been able to refocus its business on the offshore sector and, due to its credentials on Neart, have secured numerous appointments on other Scottish and UK territorial waters projects[43].

4.3 Future skills requirements

An assessment of the future skills requirements at each stage of the project

4.3.1 Construction

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

4.3.2 O&M

Turbines

In preparation for further growth in offshore wind projects as a result of the successful deployment of 7MW turbines at Neart, Siemens will develop the existing Newcastle upon Tyne Training School by installing a fully operational nacelle of the very latest direct-drive wind turbine technology, and other associated training equipment.

This expansion of the Training School will enable current and future UK service technicians and apprentices to be trained to meet the huge forecasted growth in demand on the new direct drive equipment and its associated skills for maintenance. The investment in the Training School will not only see an increase in the number of training staff based permanently at the Training Centre, but will additionally see hundreds of Service Technicians coming to the region annually for first-time and refresher training.

As one of the first projects utilising Direct Drive technology and the 7MW platform, Neart is a major factor in Siemens' decision to extend the existing training facility and increase the requirement for training staff. The impact of this training facility will see an increased pool of skilled and highly trained technicians and engineers equipped for manufacturing and operating direct drive technology, maintaining a skilled and reliable local workforce that will be able to sustain future direct drive projects.

[redacted]

[redacted]

4.4 Maintaining and developing skills

Plans that the project intends to put in place to maintain and develop the skills necessary for the lifetime of the project

Siemens

STDL has recently invested approximately £9 million in a state-of-the-art training facility at its Service

[44] C.f. Annex 21: Asset Management Paper, April 2014 (extract);

Headquarters in Newcastle. Training of technicians and staff for Neart will be completed at the facility. This investment in the Renewable Energy Engineering Centre (**REEC**) and associated resources gives STDL the largest, most experienced offshore grid connection engineering and delivery organisation in the UK.

As described above, the Siemens REEC facility will be further developed through Neart[45], particularly with regard to developing and deploying the long term O&M requirements for the OTM. Elsewhere, initiatives planned include the use of the Siemens Power Academy, a unique partnership between industry and academia created by Siemens' transmission business, to address any perceived skills shortage in power engineering through a combination of financial support and workplace mentoring for students.

Mainstream

During its operating lifetime, Neart will require strong and competitively priced O&M support. This support will cover expertise in engineering, wind analysis, energy sales market analysis and implementation, vessel provision, response programme technical teams, procurement, spare parts manufacture and provision, storage, harbour facilities, financial, legal and other advisory services. Mainstream estimates that the Neart Project will spend [redacted] per annum on these services and it will want to secure them at the keenest possible prices for good quality services.

[redacted]

[redacted]

Skills summary:

- The skills developed to date during the development phase are extensive, both within Mainstream and consultants used in Neart (port, harbours, environmental, consent, services);
- The Tier 1 partners selected by Mainstream, already deeply committed to offshore and the UK, are committing to further skills development via Neart, involving new job creation, expansion of training facilities and enhancement of manufacturing facilities (for latter, to reflect new 7MW direct-drive turbine and [redacted]); and
- The O&M skills base will grow through the Siemens Newcastle hub as well as through the launch of [redacted]

[redacted]

MAINSTREAM RENEWABLE POWER

Neart na Gaoithe Offshore Wind Farm

Supply Chain Plan Addendum

15 October 2014

Important Information

Mainstream Renewable Power Limited (Mainstream), following consultation with and input from certain of its major suppliers, presents this Supply Chain Plan to the Department of Energy and Climate Change (DECC) for the sole purpose of DECC's evaluation as to whether or not the Neart na Gaoithe Offshore Wind Farm Project (Project) meets the approved Supply Chain Plan eligibility criteria required by the Project as a pre-condition of eligibility to apply for a CfD.

At this stage, Mainstream, on its own behalf and on behalf of those of its suppliers, who have helped compile the information in the Supply Chain Plan and its annexes, advises DECC that all information in the Supply Chain Plan and its annexes is commercially sensitive and confidential and should be treated as such. In particular, DECC is asked to appreciate that information in respect of pending technological or other innovations or new business development plans is extremely sensitive because of its value to competitors. Release of such commercially sensitive information would be materially detrimental to the interests of Mainstream and all affected parties.

Mainstream recognises that if a CfD is awarded to the Project, DECC may wish to share information with the supply chain and to support implementation. In such circumstances, Mainstream will work with DECC, supported by its affected suppliers, to agree a shorter version of the Supply Chain Plan for publication at CfD award that respects the confidentiality of, then, commercially sensitive information. Mainstream, supported by affected suppliers, will again work with DECC to agree a longer version for publication that respects the confidentiality of, then, commercially sensitive information, if DECC wishes to publish a longer version of the Supply Chain Plan at the Milestone Delivery Date.

This Addendum is provided in response to the request for further information made by DECC to Mainstream on 13 October 2014. All defined terms, unless otherwise specified, have the meanings given in the Supply Chain Plan dated 8 October 2014.

Authorised Representative:

[redacted]

Since 2008, Mainstream has prioritised all work which ensures that Neart na Gaoithe has access to a sustainable and skilled workforce. Neart, which obtained its offshore consent and marine licences on 10 October 2014[1], has continuously engaged with Skills Development Scotland (**SDS**) both at project level and as a key contributor to leading industry groups including the Offshore Wind Industry Group (**OWIG**) and Scottish Renewables. Following receipt of the offshore consent, Neart now moves into its delivery phase, and will continue to progress engagement on various key skills initiatives set out in this Addendum.

4.3 Future skills requirements

An assessment of the future skills requirements at each stage of the project

SDS and Scottish Enterprise (**SE**) will facilitate initial events specifically designed to engage with the local fishing communities in order to provide a platform for opportunities to be investigated directly with Neart's main contractors. Neart will hold kick-off events in Pittenweem, Fife, Dunbar and East Lothian during January and February 2015. At a minimum, these events will cover the following areas:

- Use of vessels and their crew through the life of the Project;
- Use of crew members on other vessels; and
- Individuals wishing to retrain and work full time on the Project.

Neart will ensure that the fishing communities are sustained, and not displaced, by the Project and the wider offshore industry. The Neart team also recognises that the fishing industry's great depth of knowledge of local waters will be very beneficial to the safe, reliable and efficient operation of the Project. Therefore, offering new opportunities for (working/commercial) fishing boats and crews is of key interest. Neart will work with SDS, SE and the local fishing communities to facilitate retraining and up-skilling of this important human resource[2]. These skills will extend beyond the life of the Neart project and will work directly in further diversifying the fishing communities for the growing marine energy sector, but in particular offshore wind.

4.4 Maintaining and developing skills

Plans that the project intends to put in place to maintain and develop the skills necessary for the lifetime of the project

Military

SDS and SE will facilitate and organise initial opportunities for ex-military personnel, and soon-to-be exiting military personnel, to meet all the key contractors for the Project. Working with SDS, Neart will commit to fund re-programs for ex-military personnel who are engaged by Neart through its partnership with [redacted] and Tier 1 contractors with specific UK training centres[3]. Both the Project and the wider renewable industry offer a great alternative to the reduction in the military employment in the local area and will directly contribute to sustaining a skilled and employed population.

Port Skills

In partnership with SE, SDS [redacted] Neart will organise and facilitate workshop events for [redacted] to ensure that the Project maximises its use of local training facilities[4]. [redacted]

This development of the local workforce, and the local supply chain, is of extreme importance for the ongoing safe, reliable and cost effective operation of the Project. In the longer term, Neart and its key contractors have committed to developing training partnerships to accelerate the establishment of local, sustainable training facilities to support the Project's O&M facility based in [redacted]. Through this, the [redacted] as well as other ports utilised by the Project, will be well positioned to competitively bid for offshore wind and other marine construction work, providing strategically important facilities for the future benefit of the wider industry.

[redacted]

Scottish Enterprise

31/07/2014

David Sweenie
Offshore Manager, Scotland
Mainstream Renewable Power Ltd
3rd Floor, 2 West Regent Street
Glasgow
G2 1RW

Dear David

Scottish Enterprise are working closely with Mainstream Renewable Power to support the development of their supply chain plan for the Neart Na Gaoithe offshore project. We currently have a member of staff, Jamie McLeod, seconded to Mainstream for 2 days per week to help with the identification of Scottish, UK and international suppliers with the potential to deliver local economic benefit in Scotland. Jamie will also be working with the Mainstream team and their tier 1 contractors to help organise "Meet the Buyer" events to promote local supply opportunities. Mainstream have also supported Scottish Enterprise by speaking at supply chain events to help highlight the growth opportunities which exist within the UK offshore wind industry.

Best Regards

Ewen Cameron
Senior Manager
Renewables & Low Carbon Technologies
Scottish Enterprise

Scottish Enterprise

David Sweenie
Mainstream Renewable Power
3rd Floor
2 West Regent St
Glasgow
G2 1RW

06 October 2014

Ref: Neart na Gaoithe 'Meet the Buyer' events on behalf of NnGOWL and Tier 1 suppliers

Dear David

Per our discussions on Scottish Enterprise's (SE) support in setting up, promoting and facilitating a series of Scottish supply chain 'Meet the Buyer' events, this is to confirm that we would provide that support, in line with SE's objective to maximise the Scottish supply chain of NnGOWL. These events would be held at agreed locations on Scotland's east coast, adjacent to the NnG site off Fife Ness, around January and February 2015.

The purpose of the events would be to:-

- Raise awareness of the NnGOWL project and the scale of the opportunity it represents
- Define NnGOWL project metrics, key requirements (e.g. SHEQ), milestones, structure, innovations and contracting strategy
- Allow Tier 1 suppliers to articulate their supply chain requirements, tendering strategies and expectations of their supply chains
- Raise awareness within NnGOWL and Tier 1 suppliers of local supply chain expertise, potentially broadening and deepening the supply chain, introducing greater competition
- Identify where current expertise related to offshore engineering can directly transition or diversify to offshore wind, thereby shortening lead times and decreasing project risk
- Identify companies new to offshore wind with cost effective and innovative products, goods and services, which with support can be developed into the sector

We have a wealth of experience in these types of events, and would utilise our existing account managed contacts, company knowledge and database of renewables suppliers.

In our experience, these types of events have proven not only to encourage developers and Tier 1 suppliers to interact with the local supply chain, but to help stimulate collaboration within the supply chain. The events also raise awareness of public sector support available to supply chain companies to transition/diversify into the offshore wind sector.

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50 Waterloo Street
Glasgow G2 6HQ
Telephone 0845 607 8787
Fax 0141 248 1600
www.scottish-enterprise.com

Scottish Enterprise

As an example of the impact that can be achieved, metrics for another Scottish offshore wind project that we supported show:-

- Three supply chain events held in 2014
- Attracted **294 delegates,** of which 26% were new to offshore wind.
- Delegates came from across **247 organisations** of which 96% were from the UK.
- **144 supply chain one-to-one meetings** held between the developer/potential tier 1 suppliers and the potential supply chain companies.
- Delegates reported over **240 new business contacts**.
- **90 requests for support** were received across public agencies/initiatives including Scottish Enterprise, Highlands & Islands Enterprise, SE's Expert Support Programme, GROW and Skills Development Scotland.

It would be reasonable to expect similar impact from events for NnGOWL and your stakeholders, and we look forward to supporting you to add value to your project.

Yours sincerely

[redacted]

Jamie mcLeod
Senior Executive
Renewables and Low Carbon Technologies
Scottish Enterprise

David Sweenie
Offshore Wind Manager Scotland
Mainstream Renewable Power
2 West Regent Street
Glasgow
G2 1RW

Enterprise, Planning and Protective Services

Robin Presswood
03451 555555 ext. 442260
robin.presswood@fife.gov.uk

14th August 2014

Dear David,

Re: Neart na Gaoithe

It is my pleasure to support the Neart na Gaoithe Offshore Wind project which is currently being developed by Mainstream Renewable Power approximately 15km off the Fife coast.

The Neart na Gaoithe project has the potential to generate 450MW of renewable energy, which is enough power to supply around 325,000 homes and will offset over 400,000 tonnes of emissions each year.

This project will not only make a significant contribution to Scotland's ambitious renewable energy generation and CO_2 reduction targets, it also has the potential to contribute significantly to economic growth in the region.

Fife Council has fully supported this offshore wind development as a key consultee under section 36 of the consenting process, subject to minor amendments to the mitigation methods as outlined within the related Environmental Statement submission. These minor amendments related to noise, ecology and ornithology, cultural heritage and commercial fisheries but the Council considers these easy to amend to ensure the mitigation methods have our full support. Fife Council welcomes any investment and development interest that will generate positive opportunities and benefits for Fife which was highlighted as part of the consultation response.

The Council's Economic Development team has been working with Mainstream Renewable Power over recent years to outline the opportunities and capabilities of the local supply chain here in Fife and ensure that we maximise the wealth of expertise which exists in the region. Examples of local companies who can provide high-quality local content to offshore wind projects include leading heavy fabrication companies such as Bifab, engineering support services experts such as Babcock and specialist marine environmental consultants such as SMRU Marine.

Our work with Mainstream has involved the development of joint initiatives such as supply chain contracting workshops and involvement in the development of a potential dedicated Neart na Gaoithe community benefit fund. Mainstream has also regularly attended and proactively supported East Coast Renewables partnership meetings and initiatives.

We look forward to working with the Neart na Gaoithe project team to ensure the successful delivery of this ambitious offshore wind project and to maximising the significant local supply chain opportunities associated with the manufacturing, assembly and ongoing operations and maintenance of this project.

Yours sincerely

Robin Presswood
Head of Enterprise, Planning and Protective Services

OUR VALUES

We believe in a Safe Environment for our people

By putting safety first, we have created an environment in which people work at their best – assured in the knowledge that their security is priority.

We believe in showing Personal Respect for everyone we deal with

Respect forms the core of the most successful relationships. And relationships are the foundation block of our business. Where there is mutual respect, trust is established and partnerships thrive.

We believe that by Working Together as a team, we deliver more

We won't achieve our vision in isolation. By coming together, sharing information and working towards a common goal, we empower each other to deliver a sustainable future and share in its success.

We believe that an Entrepreneurial approach will find the solutions others can't see

The world is facing monumental challenges. We won't overcome them by conventional thinking. This is the time for finding new ways. Those with innovative concepts and creative solutions, coupled with the commitment to deliver them, will lead the way forward.

We believe in a Sustainable approach to everything we do

We think about tomorrow and how today's actions will impact our future. It's central to everything we do. Taking the long-term view is fundamental to the success of our business; to the relationships that we form; and for the future of our planet.

We believe that by Embracing Innovation we will stay ahead of the game

Our success reflects our flexibility and openness to embrace innovation across all our markets and business activities, reducing cost and maximising performance. Only by driving good practice and new ideas will we develop as a team, grow as a business and evolve as an industry.

MAINSTREAM RENEWABLE POWER