



European Offshore Wind Deployment Centre

Preliminary Environmental R&D Proposals
Aberdeen Offshore Wind Farm Limited

June 2012

VATTENFALL



Technip

areg
Aberdeen Renewable Energy Group



A project part-funded by the
European Union under the
European Economic Plan for
Recovery in the field of Energy

PREFACE

On 1st August 2011 Aberdeen Offshore Wind Farm Limited (AOWFL) applied to the Scottish Ministers under Section 36 of the Electricity Act 1989 (as amended), and applied for a Marine Licence under the Marine (Scotland) Act 2010 to construct, operate and decommission an offshore wind farm and deployment centre off the coast of Aberdeen, Aberdeen Offshore Wind Farm, also known as the European Offshore Wind Deployment Centre (EOWDC).

The application comprised an Environmental Statement (ES), prepared in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended) and Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and followed current best practice.

The August 2011 submission comprises the following volumes:

- Volume 1 – Non-Technical Summary
- Volume 2 – Environmental Statement
- Volume 3 – Figures
- Volume 4 – Technical Appendices

Project Description / Rochdale Envelope

When the ES was submitted to Marine Scotland in August 2011, it had been agreed that further information would be required in support of the application. This further information was referred to as an 'Addendum' to the ES.

An application for an Offshore Wind Farm requires some flexibility to enable subsequent detailed design. This is particularly important in the context of the scheme to be developed as a demonstrator site. In order to carry out an environmental assessment of the project, parameters require to be defined and sufficient information provided to enable the identification of the significant effects. These parameters form the Rochdale Envelope.

At the time of defining the Rochdale Envelope (as submitted August 2011) the project engineers undertook consultation with the supply chain to understand their ambitions and likely details of their future wind turbines which were at an early stage of development. The results of this initial consultation were inevitably a reflection of the supply chain at the time, and the stated ambitions of manufacturers at the time.

In keeping with the concept of a demonstrator site, over recent months, AOWFL has engaged with global turbine suppliers who wish to demonstrate their next generation turbine technology at the AOWF site. AOWFL has commenced a formal commercial process to identify and refine the turbine supply options for the site. This process is at an early and confidential stage, however revised turbine specifications have been made available to the project by the manufacturers.

The overarching objective of the EU grant associated with AOWF, is to deploy new equipment, systems, processes and initiate R&D to improve the competitiveness of offshore wind energy production, whilst generating environmentally sound marketable electricity and to increase the supply chain capabilities in Scotland, the wider UK and Europe.

The commercial evaluation of prospective turbine suppliers who can meet the EU requirements has revealed that a number of manufacturer’s turbines marginally exceed the Rochdale Envelope parameters (as submitted). These turbines would require an adjustment to the tip height of up to 198.5m, and rotor radius of up to 86m as summarised in the table below.

Please note that the maximum dimensions are likely only to be applicable to specific wind turbine locations and are unlikely to be relevant to all 11 turbine locations. Please also note that a minimum clearance of 22m above Mean High Water Springs (MHWS) will be maintained for marine navigation.

Table 1: As submitted Rochdale Envelope and proposed adjusted Rochdale Envelope

Parameter	Rochdale Envelope as submitted	Rochdale envelope (as requested)	Differential
Tip Ht (aLAT)	Up to 195m	Up to 198.5	3.5m
Hub Ht (aLAT)	Up to 120m	Up to 120m	Nil (likely reduction)
Rotor radius (diameter)	Up to 75m (150m)	Up to 86m (172m)	11m (22m)

Environmental Statement Addendum (June 2012)

Addenda are commonly submitted as a project evolves through time to clarify issues, or to provide additional baseline data and updated environmental assessment information. This report (Preliminary Environmental R&D Proposals) forms part of the ES Addendum.

The June 2012 Addendum contains the following information:

- Additional bird and marine mammal baseline data.
- An additional visualisation from Girdleness lighthouse.
- Results of a geo-locational study into golf courses and Round 1 offshore wind farms.
- Requested minor adjustments to turbine dimensions which form a part of the project description information, known as the ‘Rochdale Envelope’.
- Supporting statement and representative viewpoints of landscape and visual effects taking account of the adjustments to the Rochdale Envelope and preliminary design principles.
- Updated ornithological collision risk modelling resulting from the updated Rochdale Envelope, updated ornithological impact assessment, and updated Habitats Regulations Assessment.

Where to View the Consent Application

The ES addendum submission may be viewed at the following locations during normal office hours:

<p>Vattenfall Wind Power Ltd 3rd Floor The Tun Holyrood Edinburgh EH8 8AE</p>	<p>Balmedie Library Eigie Rd Balmedie AB23 8YF</p>
<p>Aberdeen Central Library Rosemount Viaduct Aberdeen AB25 1GW</p>	<p>Peterhead Library 51 St Peter Street Peterhead AB42 1QD</p>
<p>Ellon Library Station Road Ellon AB41 9AE</p>	<p>Bridge Of Don Library Scotstown Road Bridge Of Don Aberdeen AB22 8HH</p>

The ES addendum can also be viewed at the Scottish Government Library at Victoria Quay, Edinburgh, EH6 6QQ.

OBTAINING YOUR OWN COPY OF THE PLANNING APPLICATION ADDENDUM

The ES addendum is available on the Vattenfall website:

<http://www.vattenfall.co.uk/en/aberdeen-bay.htm>

INTRODUCTION TO THIS DOCUMENT

Renewable energy electricity generation is recognised as being vital for decarbonising the global energy system and hence global climate change mitigation. Onshore wind energy is becoming one of the most competitive technologies to date within the EU. Offshore sites offer significant potential opportunities to develop vast wind resource capacity through large scale implementation. However, they pose huge challenges which require technological innovation, industrial and market development, together with high levels of cost reduction and better understanding of how these larger deployments interact with the environment before they become cost competitive with other forms of energy sources. Aberdeen Offshore Wind Farm aims to be able to accelerate the cost reductions needed by the industry and increase the learning and understanding of how these large wind turbines perform and interact with the environment.

The Aberdeen project offers an ideal opportunity to undertake environmental R&D and utilise the results to feed into future Scottish Territorial Waters and Round 3 offshore wind projects. Via the EU grant, a proposal has been made to allocate approximately £2.7 million, funded jointly by the Applicant and the EU to environmental studies until 2016. These environmental studies will be over and above what would be required in a general consenting process and the data and research will be made publically and widely available and includes copies of the comments received from statutory consultees to date.

The environmental research will be accompanied by other R&D activities based in and around the wind farm. These will cover research topics such as; instrumentation, electrical, foundations, metocean, condition monitoring, O&M to name but a few. The exact mechanism of how this research will be conducted has not been firmly established, but herein we are proposing a potential method covering how the environmental R&D might be executed. The mechanisms for the environmental research program have been expedited due to the intrinsic link between marine consents, survey work and the potential environmental research programme. It is hoped that the other R&D topics could follow in a similar format. The document attached herein, outlines our proposed mechanism for delivering and managing any proposed environmental research topics.

Proposals for Delivering Environmental R&D Programme for EOWDC

As submitted to Marine Scotland for comment in February 2012

Attendees:

Nathalie Stevenson, Gavin Scarff & John Price (AOWFL)

Sue Lawrence, Karen Hall & Erica Knott (SNH)

Ian Francis (RSPB)

Nicola Abrams (SEPA)

Sarah Dolman (WDCS)

Jim McKie, Roger May & Andrew Sutherland (MS LOT)

Ian Todd (AREG on behalf of AOWFL)

Gareth Jones, Rory O'Hara Murray (MS Science)

Craig Bloomer & Phil Bloor (Genesis)

Introduction

Aberdeen Offshore Wind Farm Limited (AOWFL) has been developing a wind farm in Aberdeen since 2005. Originally the site was developed as a suitable location for an offshore commercial wind farm. However, in 2008 it was recognised that the site had benefits for testing offshore wind given the location was between 2km – 4km from the shore. The overall vision for the project has therefore been expanded to incorporate a deployment centre and technology enabler alongside a small scale commercial wind farm.

This expanded project will deliver a ground-breaking centre for the acceleration of offshore wind development in Europe. The project will be situated offshore Aberdeen City, which is a recognised centre of excellence for offshore activities. The area has significant industrial skills, developed as a result of North Sea oil and gas experience and expertise, that are available for transfer into the developing offshore wind market to provide innovative solutions to the challenges currently being faced.

The AOWF project, including the deployment centre, is in a perfect position to meet the very tight timescales to commit funding through the European Economic Plan for Recovery (EEPR). The project will be able to deliver the main goals of EEPR, namely to ensure European knowledge, know-how and deployment capability is built and delivered by the fund.

The deployment centre will create an opportunity for the development of innovative designs to overcome the challenges facing the offshore wind industry. It will create an environment that will enable new designs to be tested in a controlled, yet real, environment. Additionally, it will provide independent validation and accreditation for all developers to be able to use. This will have the effect of reducing capital and operating costs with commensurate reductions in risk premiums. The deployment

facility will provide a unique opportunity for the offshore wind industry to ensure that optimal solutions for cost, reliability and capacity are realised, with a high degree of control and risk mitigation, before deployment of the design in much harsher and more challenging offshore sites.

The proposed AOWF project will have two main elements as illustrated below and this document refers specifically to the environmental monitoring R&D

Commercial Wind Farm	Deployment Centre
<ul style="list-style-type: none"> • Innovative Wind Turbines • Innovative Foundations • Innovative Cabling / laying • Onshore Facilities 	<ul style="list-style-type: none"> • Ocean Laboratory • Environmental Monitoring R&D • Training Opportunities

Figure 1. Key components of the project.

The vision of the AOWFL project is:

“To deploy new equipment, systems, processes and initiate R&D to improve the competitiveness of Offshore Wind Energy production, whilst generating environmentally sound marketable electricity and to increase the supply chain capabilities in Scotland, the wider UK and Europe”

At the heart of the project is the interaction between a research, test and training centre with a small, highly innovative, commercially operated and highly instrumented and monitored offshore wind farm. The technologies deployed on the wind farm will provide supporting income to the centre and will offer potential opportunities including commercial R&D, testing and dissemination including:

- Long-term environmental monitoring and improvement.
- University level research.
- Community, regional, national and international education.

This project is targeted at both enabling and encouraging increased competition into the European wind turbine supply chain by providing sites for manufacturers both to prove new and innovative solutions and also to allow the acquisition of offshore “hands-on” design, build and operational and maintenance experience, in advance of Round 3.

This project would allow “first of run” production wind turbine systems to be operated in the marine environment so that developers, owners and financiers can gain confidence in wind turbine manufacturer’s new machine designs, allowing the development of the supply chain in this area. The intention is to highly instrument the equipment to provide maximum learning opportunity.

The EOWDC has the potential to promote and enable the deployment of pre-production innovative foundations, or foundation production methods. It may also be available as a platform to test energy storage and/or Flexible Alternating Current Transmission Systems (FACTS) devices.

AOWLF may also look at increased monitoring of elements of the infrastructure (turbines, foundations, cables) but also the operating conditions (wind, wave and tidal forces) which would improve understanding of wind farm design and operation to ensure increased efficiency and operation.

Environmental Research and Development Opportunities

A key aspect of the proposed EOWDC is to encourage and enable environmental monitoring through ongoing research and development in advance of the larger build and operational experience of Scottish Territorial Water Developments and Round 3.

The agreed environmental monitoring programme would be in addition to the industry norm and would seek to answer outstanding questions on environmental impacts of offshore wind, which will be of benefit to all stakeholders. The programme would provide stakeholders with information on the environmental impacts of new technologies, processes and operations, and the Applicant hopes to encourage University level research especially that from University of Aberdeen and the Robert Gordon University.

There is potential for an Ocean Laboratory that could hold meteorological masts, environmental monitoring equipment and be used for access training. The inclusion of an Ocean Laboratory would allow environmental monitoring, both during and after deployments, but would be subject to a separate consenting application. Alternatively, if the R&D committee advise that alternative research options that do not rely on an offshore structure would yield better results and value for money, then these will be considered by AOWFL.

The environmental effects of the deployment centre could be closely monitored and data collected prior to Round 3 offshore wind farms being installed. Not only will the R&D further develop a baseline measured environmental position in Aberdeen Bay, but monitoring will continue through construction and operation and will remain in place during construction and early operation of the Round 3 developments in the Moray Firth and Forth Estuary in order to aid the assessment of potential cumulative impacts of eastern Scottish offshore wind farm developments and communicate these findings to stakeholders.

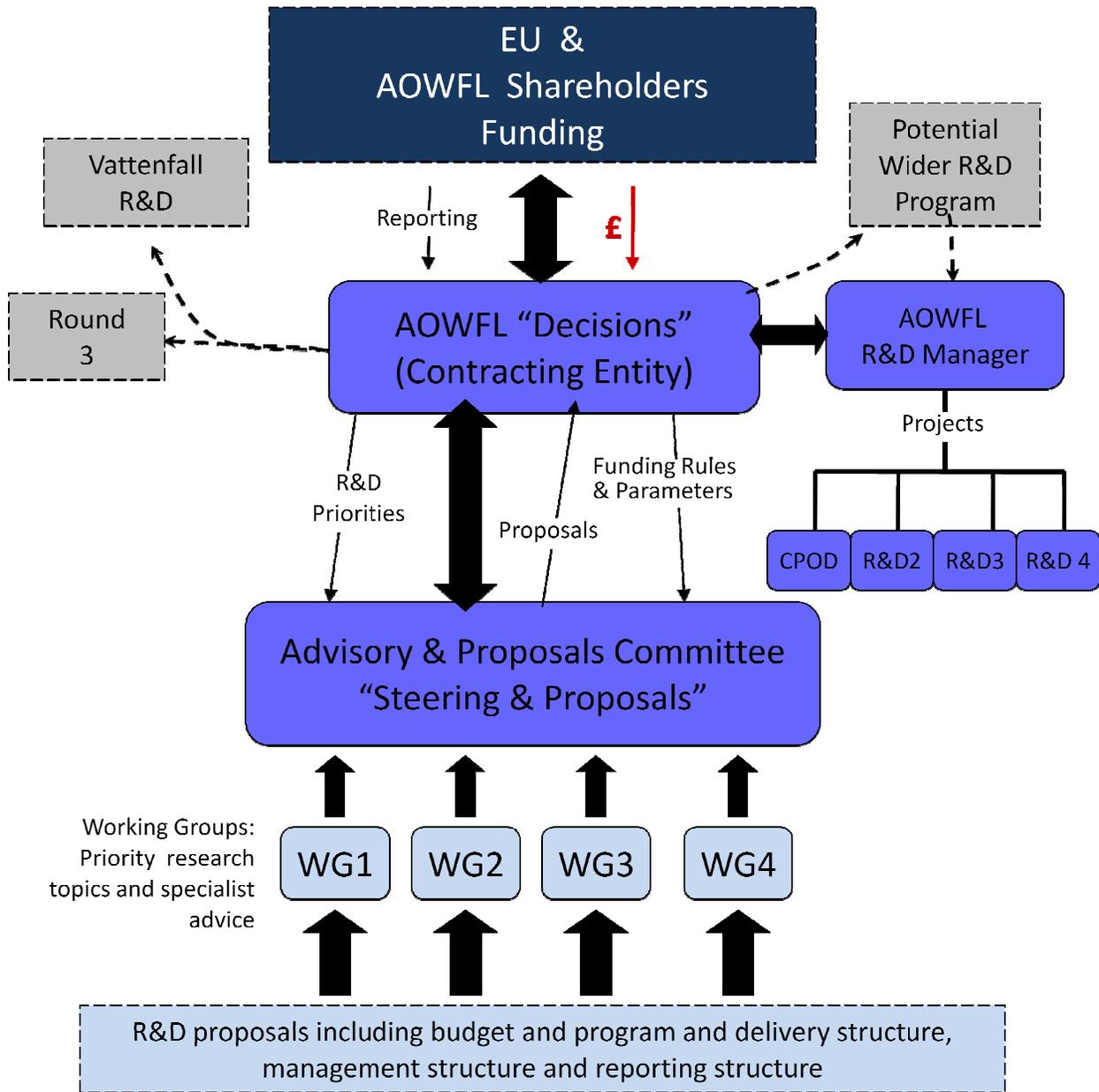
Via the EU grant, a proposal has been made to allocate in excess of £2.7 million, funded jointly by the Applicant and the EU to environmental studies until 2016 including the development of environmental research with external partners (this funding is over and above the costs of the met mast Ocean Lab). Details of exact activities, and confirmation of EU matched funding will be achieved as research proposals and requirements are received and selected.

The EU funding package is intended to undertake on-going environmental research and sharing of knowledge with other EU organisations, communication with stakeholders and industry bodies.

AOWFL will undertake a programme of environmental monitoring of the impact of the wind farm development as part of the consenting process. The environmental programme offered seeks to answer outstanding questions on environmental impacts of offshore wind and especially cumulative impacts of multiple wind farm development, which will be of benefit to all stakeholders.

Deliverables include 1) Feasibility study on environmental research options and 2) Further deliverables determined as a result of the above.

R&D: Ongoing Environmental Research



Please note that the ES contained an error which states that the EU funding extends for the lifetime of the wind farm project. This is not the case, and only extends for the lifetime of the EU grant i.e. until the end of 2016. Therefore, the £2.7M committed from project funds and EU funds will have to be expended by end of 2016. Subject to funding being available at the time, the environmental R&D programme may continue via the Vattenfall R&D program, and in principle this has been agreed already but will be subject to a proper justification and evaluation process.

In parallel it is hoped that the environmental monitoring work within the spinoff deployment centre business becomes successful and it is envisaged that support funding could be used to pursue further grants from the EU and wider sources to continue the R&D. It is also hoped that the spin off wider R&D 'hub' becomes self funding prior to the termination of the EU contract

Proposed High Level Management Structure for R&D Management

AOWFL is commencing a feasibility study to scope out the potential environmental research opportunities for the site and will encourage input from interested parties including statutory nature conservation agencies and research organisations and external Consultants working in the offshore wind sector. AOWFL has developed a project for the deployment of acoustic listening devices (Cpods) however progress has been affected by heritable fishing issues which require resolving ahead of the Cpods being deployed.

Proposed mechanisms for how to manage and deliver the environmental projects and how to handle environmental project proposals are shown below. This is a preliminary high level proposal as how to deliver the ongoing environmental research programme. The exact mechanics of how research proposals are funded or executed need to be finalised.

In preparing this proposal the following establishment principles were considered:

- The structure must enable statutory nature conservation bodies to identify preferred R&D priorities and the opportunity to steer meaningful research which will improve the information base or improve uncertainties around specific environmental impacts of wind farms, particularly associated with new technologies, and installation methods (such as innovative foundation types, new turbines etc).
- Meetings must be manageable and efficient and thus it is envisaged that topic working groups are established for instance, working groups for marine mammals, another for ornithology, another for fisheries etc. Suggestions associated with topics are welcome.
- Due to funding rules, any projects funded by the EU must be managed by AOWFL (Vattenfall and AREG being the defined co-beneficiaries) and the expenditure of EU monies is subject to strict controls and criteria associated with procurement, value for money and expenditure deadlines.
- An environmental R&D manager will be initially appointed by AOWFL to manage projects directly funded by the EU grant monies and any possible additional projects funded from Vattenfall R&D Programme.
- The Environmental R&D manager will be the delivery manager for projects funded directly via the EU and/or Vattenfall.
- In the future, there may be a wider R&D program through the spin-off deployment centre for which feasibility studies are about to commence. It is anticipated that linkages and joint R&D programs with universities and industry will be served through this route. AOWFL may chose to delegate all management of the R&D program to the spin off R&D hub if successful.
- The Environmental R&D manager will form the main linkage between wider RnD program, including linkages with external parties including but not limited to Renewable UK Consents and Licensing Group and Strategic Ornithological Support Services.

Draft terms of reference of Advisory & Proposals Steering Group:

Whilst detailed terms of reference will be developed following their establishment the suggested role of members includes the following:

- Provide a co-operative base from which to share environmental R&D information relating to offshore wind farms, including responsibility for canvassing within own organisations
- Provide a cooperative base for an identifying priorities for environmental R&D to shortlist critical areas of research and to evaluate R&D proposals
- Provide a co-operative base for steering the delivery of environmental R&D projects at the EOWDC
- Provide a collaborative route for information dissemination and publication of R&D results from the EOWDC
- To provide strategic advice on enhanced stakeholder engagement
- To co-ordinate and lead consultations with project working groups

NB Standing membership may be supplemented by *ad hoc* arrangements/participation in meetings as appropriate subject to majority agreement.

NB Marine Scotland will nominate up to 2 individuals for the Advisory committee, preferably individuals who have access to other strategic Marine Scotland Fora such as the Marine Strategy Forum.

It is anticipated that the Advisory and Proposals Committee will meet at least twice a year.

Draft Terms of reference for Working Groups Group:

Whilst detailed terms of reference will be developed following establishment of suggested working groups, the provisional TOR includes the following requirements:

- To identify critical priority issues to take forward through discussions with the Advisory & Proposals Steering Group.
- To develop scopes for research projects through discussions with the Advisory & Proposals Steering Group.
- To support the technical evaluation of R&D proposals and to disseminate environmental R&D results within their organisations

- Following acceptance of the initial set of members, the group will have voting rights as to additional members or replacements due to staff changes, if required.

NB Each statutory nature conservation body will have the option to nominate representatives to sit on the relevant work groups.

It is anticipated that the working groups will meet a minimum of twice a year, but up to quarterly.

Draft Terms of reference for the Environmental R&D Manager:

With respect to the Advisory and Proposals Committee (as opposed to full job description) the R&D manager terms of reference includes the following requirements

- To identify and propose projects
- To oversee the tendering process
- To provide project management for the research projects
- To be the main contact for statutory nature conservation bodies via the Advisory and proposals steering committee and working groups
- To report project results to AOWFL and the Advisory & Proposals committee.

Preliminary Tasks (march- September 2012):

The initial tasks to be carried out over the next 6 months include the following

1. Establish Members of the Advisory and Proposals Committee
2. Establish working groups and members
3. Finalise TOR for committee and working groups
4. Feed into feasibility study to scope out the potential environmental research opportunities for the site, including appropriate timescales

Initial work on marine mammals and ornithological R&D:

The consultants Genesis have provided some preliminary ideas for R&D based on their experience of the site and suitability for areas of research based on the species present and abundance levels present, and also following on from consultee comments.

These have been discussed with the Vattenfall R&D group with respect to Round 3 priorities for research and some initial ideas are presented for consideration below.

Description
Noise measurements of construction noise (including both piling and other construction sounds eg vessel movements).
Mitigation of piling sound levels
Scour investigations of turbine foundations.
Changes to benthic communities (eg studies examining colonisation of turbines and area in-between turbines)
Collision risk studies on birds.
Tagging studies to better understand use of the area by specific seabird species
Radar studies at seasonal periods e.g. to better understand geese migration. (could occur from land, or from a fixed platform if the Ocean Laboratory is able to accommodate this).

Appendix 1: Responses from Statutory Consultees

1. Joint Dee, Don and Ythan District Salmon Fishery Boards
2. Marine Scotland Science
3. The Royal Society for the Protection of Birds in Scotland (RSPB Scotland)
4. The Scottish Environment Protection Agency (SEPA)
5. Scottish Natural Heritage (SNH)
6. The Scottish Wildlife Trust (SWT)
7. The Whale and Dolphin Conservation Society (WDACS)



Dee District Salmon Fishery Board

Andrew Sutherland
Marine Renewables Licensing Advisor
Marine Scotland – Marine Planning & Policy Division
Scottish Government
Marine Laboratory,
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

28th March 2012

Dear Mr Sutherland,

Proposals for Delivering Environmental R&D Programme for EOWDC

On behalf of the three District Salmon Fishery Boards, along with the associated River Trusts, which serve a large part of the North East of Scotland i.e. the Rivers Dee, Don and Ythan, we welcome the opportunity to respond to the above mentioned proposal.

The three Rivers welcome the concept of the environmental programme to be run alongside the proposed wind farm development as all three Boards recognise that this trial development provides an excellent opportunity to gain a greater understanding on the impacts that such marine renewable developments can have on migratory salmonids. It is noted however that none of the potential projects identified to date appear to have any relevance to this specific issue in that initial considerations have been made for R&D work on marine mammals and ornithological interests only. We would take this opportunity to remind the developers of their legal responsibilities to Atlantic salmon under the Habitats Directive for the River Dee (Special Area of Conservation under the EC Habitats Directive 92/43 EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna for Atlantic salmon).

River Office, Mill of Dinnet, Dinnet, Aboyne, Aberdeenshire, AB34 5LA

Tel No: 013398 80411 e-mail: info@riverdee.org www.riverdee.org.uk

This was one of the main points raised in our response to the licence application for the wind farm, as per our correspondence of September 2011.

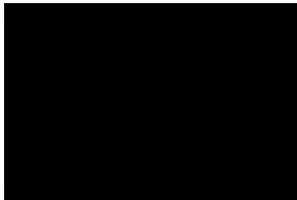
The three Rivers would reiterate their opinion that a suitable environmental R&D programme should be operational prior to the construction phase of the wind farm so that baseline data can be collected. We consider this to be vitally important so that the different techniques employed in the various innovative methods of installing turbines can be evaluated against an established robust baseline and acted upon as necessary.

In view of the importance of salmonids, as highlighted by statute, not only to the ecology of the three rivers but also the value to the local economy we would request that we are represented on the Advisory and Proposals Committee and also on the pertinent Working Groups so that we can ensure that research relevant to Atlantic salmon and sea trout is conducted alongside the other environmental interests in a positive manner.

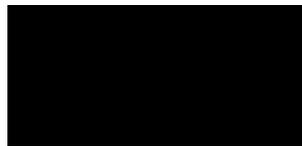
To this end the three Rivers would ensure that they committed the necessary manpower resources to the programme.

We look forward to working with you in a close, proactive and co-operative manner.

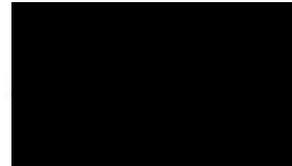
Yours sincerely



Mark Bilby
Dee District Salmon
Fishery Board



Mark Andrew
Ythan District Salmon
Fishery Board



Jon Davison
Don District Salmon
Fishery Board

River Office, Mill of Dinnet, Dinnet, Aboyne, Aberdeenshire, AB34 5LA

Tel No: 013398 80411 e-mail: info@riverdee.org www.riverdee.org.uk

From: Gareth.Jones@scotland.gsi.gov.uk [mailto:Gareth.Jones@scotland.gsi.gov.uk]
Sent: 22 March 2012 14:05
To: MS.MarineLicensing@scotland.gsi.gov.uk
Subject: RE: 018/OW/AOWFL - 9: Request For Comments R & D Proposals EOWDC: 27 February 2012

Hi Andrew

I ran this past Colin Moffat, Derek M and Ian D. Ian sent some brief comments which are outlined below.

Cheers

Gareth

Labelling the above 1-7

1. This is useful
2. Very useful
3. This would be an engineering issue and less useful for us
4. Lesser interest
5. Very useful if these ideas are new and provide useful additional information
6. Site specific and so not very useful, unless there are some novel ideas involved
7. This could be very useful but radar studies of bird movements in general and not just geese

Other ideas

- Displacement is a useful research target. Mainly with regards to birds but possibly to marine mammals or even fish (depending on what's present).
- Some work on fish, mainly salmonids but perhaps other species depending on what is present. Also looking at reactions of fish to magnetic fields from cabling.
- With regards to MSS input, we could help encourage the useful projects. In some cases, joint funding or collaborative work could be considered. Noise would be a good example. Behaviour of fish might be another.

Gareth Jones

Marine Ecologist

Renewable Energy & Marine Spatial Planning

Marine Scotland – Science

Scottish Government | Room C302 | Marine Scotland Science | Marine Laboratory | 375 Victoria Road | Aberdeen | AB11 9DB

Tel: +44 (0)1224 295347

S/B: +44 (0)1224 876544

Mob: +44 (0)7740 463010

Fax: +44 (0)1224 295511

e: Gareth.Jones@scotland.gsi.gov.uk

w: <http://www.scotland.gov.uk/marinescotland>

Proposals for Delivering Environmental R&D Programme for EOWDC

Comments by RSPB Scotland

March 2012

Introduction

Thank you for offering us the opportunity to comment on this developing issue. We believe strongly that a detailed monitoring and research programme is an integral part of the underlying philosophy of this test centre, and is clearly necessary to discharge elements of the European funding package. RSPB Scotland would be happy to become involved in discussions over how these aspects could be taken forward. We note the vision for this project, as set out in the R&D proposals document (page 2):

The vision of the AOWFL project is:

“To deploy new equipment, systems, processes and initiate R&D to improve the competitiveness of Offshore Wind Energy production, whilst generating environmentally sound marketable electricity and to increase the supply chain capabilities in Scotland, the wider UK and Europe”

At the heart of the project is the interaction between a research, test and training centre with a small, highly innovative, commercially operated and highly instrumented and monitored offshore wind farm. The technologies deployed on the wind farm will provide supporting income to the centre and will offer potential opportunities including commercial R&D, testing and dissemination including:

- *Long-term environmental monitoring and improvement.*
- *University level research.*
- *Community, regional, national and international education.*

We consider that there are substantial opportunities here to ensure that we learn much more about the environmental impacts of offshore wind turbines and their operation in advance of much larger STW and Round 3 developments. These opportunities should not be missed, especially since it is made clear that the £2.7M allocated for environmental monitoring needs to be used by end of 2016. The development of the research aspect of the test centre without doubt provides a very strong basis for understanding more about a wide range of environmental issues, and importantly should allow the results to be made widely available as quickly as possible.

High level management structure

We note the proposed structure and do not disagree with it. RSPB Scotland would be keen to provide input and comment to the ‘Advisory & Proposals Committee’ and/or the various working groups, especially that relating to ornithology. We would request greater clarity as to the breadth of involvement envisaged for these two levels of group – for example, would a nature conservation NGO such as RSPB at least potentially be a member? There is much mention of “statutory nature conservation bodies”, which may themselves nominate

representatives, but the interest and indeed expertise necessary to make these groups work effectively is not confined to the statutory sector. If the test centre R&D structure is to work as effectively as possible, its membership and inputs should be as broad-based as possible, and it should have to capacity to adapt flexibly to policy and research developments and novel technological change. Ensuring good information flows within the various management structures is crucial to this.

Ornithological research and monitoring work

RSPB Scotland's main interest lies with ornithological R&D work, though clearly there are substantial and logical extensions to a range of marine habitat issues and their interactions with other organisms. A well-designed and comprehensive research and monitoring programme should be developed that is innovative and inclusive. We note the table on page 9 of suggested R&D ideas from Genesis. The subjects suggested there are valid but are general high level topics. We would suggest that appropriate ornithological work could include:

- Methods of detecting and monitoring bird collisions in a marine environment (with emphasis on electronic monitoring and instrumentation)
- Deterrent methods to prevent bird collisions designed into the turbines
- Methods of turbine shutdown at times of high bird movements
- Studies of behaviour of birds in relation to turbines, especially during periods of bad weather (observational and instrumentation studies)
- Impacts of turbines on benthic ecosystems and food chains, and especially the ecology of any 'reef effects' that might develop
- The use of the turbine envelope for feeding by birds, and research into their food supply and how it changes
- A facility for the accommodation of bird observers in the offshore laboratory should be considered
- Tracking of movements of birds from nearby colonies should be funded (the RSPB's 'FAME' project is rapidly gaining cutting edge expertise here which could help inform this)
- The design of turbines and associated technology that not only test parameters relevant to the turbines themselves but which also plan in advance to test their environmental impacts.

Impacts of wind turbine operation on key species

In addition to the known important species covered by the monitoring studies for the EOWDC proposal, long-tailed duck and velvet scoter have just been reclassified by BirdLife International as globally threatened species. This is an example of how the changing conservation status of species can suggest adaptation in research methods to address their needs and potential problems. The Aberdeen offshore area could be a good place to learn more about these species interactions with offshore wind farms.

At this stage, then, many details of the potential R&D programme remain to be determined, but establishing a group that can advise of issues and begin to plan project work would seem to be an urgent priority.

Dissemination of data and research results, and storage of biological records

We believe that at a very early stage, a commitment should be made to ensure that ongoing research results are made available to all legitimate users and that constraints that can potentially undermine projects such as this, such as commercial confidentiality, do not restrict the utility of this R&D facility. There should be a presumption, for example, of early posting of preliminary results to a public website, with appropriate caveats. A clear statement of an open, interactive approach to this issue would be very welcome, as this would be a strong hallmark for a partly publicly-funded project that must be transparent in its ongoing work in order to maximise the public benefits.

Ian Francis

On behalf of RSPB Scotland

30 March 2012

Our ref: PCS/118935
Your ref: European Offshore

Andrew Sutherland
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

If telephoning ask for:
Nicola Abrams

26 March 2012

By email only to: ms.marinelicensing@scotland.gsi.gov.uk

Dear Andrew

R&D Environmental Research Paper: European Offshore Wind Deployment Centre Aberdeen

Thank you for providing SEPA with the opportunity to comment on this draft discussion document. We consider that the installation of an Ocean Laboratory located offshore would provide an ideal platform to monitor wider environmental processes within Aberdeen Bay. It could provide very useful information to improve our understanding of cumulative impacts of offshore windfarm development on nearshore coastal processes and associated marine habitats. The collection of water level, current flow and meteorological data, with associated water quality parameters, would provide extremely useful information for hydrodynamic model calibration and validation. This information would also contribute to improving our understanding of climate change and storm surge events.

The project could also look into the colonisation of marine structures by native and non-native species, and the feasibility of deploying monitoring equipment on the turbine monopiles located in offshore windfarms.

We would welcome the opportunity to input further to this project in due course.

If you have any queries relating to this letter, please contact me by telephone on 01224 266698 or by e-mail to planning.aberdeen@sepa.org.uk

Yours faithfully

Nicola Abrams
Senior Planning Officer
Planning Service



Chairman
David Sigsworth

Chief Executive
James Curran

Aberdeen Office
Inverdee House, Baxter Street
Torry, Aberdeen AB11 9QA
tel 01224 266 600 fax 01224 896 657
www.sepa.org.uk



Scottish Natural Heritage Dualchas Nàdair na h-Alba

All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Andrew Sutherland
Marine Scotland
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Your ref:

Our ref: CNS/REN/Offshore
Wind/EOWDC – Aberdeen Bay

Date: 1st June 2012

By email only.

Dear Andrew

European Offshore Wind Deployment Centre (EOWDC) Proposals for Delivering Environmental Research and Development Programme

Thank you for providing SNH the opportunity to provide comments on the proposals put forward by Aberdeen Offshore Windfarm Ltd (AOWFL) in taking forward a Research and Development (R&D) programme.

General Comments

The document separates the R&D options between technical, environmental etc, however we would stress that aspects of technical design, deployment options including methods of construction and operational maintenance are all aspects which can be influenced by or influence environmental considerations. It will therefore be difficult at times to tease out issues relating to the deployment centre from that of the commercial windfarm aim.

We also have some concerns that the final R&D environmental monitoring programme incorporates environmental monitoring required as part of conditions to any consent. Whilst we recognise there may be funding opportunities associated with a R&D programme, conditions to any consent should be seen as an ongoing requirement, to be financed as part of the overall investment strategy.

SNH very much support the opportunity that this R&D programme could provide to promote and enable the deployment of first of run turbines or pre- production innovative foundations; energy storage and Flexible Alternating Current Transmission Systems (FACTS) devices. There may be other elements also worthy of consideration that have as yet not been identified, but may come forward if the project is consented. We would be happy to continue to remain involved in providing advice as this programme is developed.

Specific Comments

Environmental research and development opportunities

The proposal for an Ocean Laboratory will need careful consideration, and this consideration should include:

- identification of consenting conditions and how these may be delivered;
- identification of what monitoring may be being planned for and or seen as data gaps prior to or as part of the roll out of Round 3 / STW sites, and
- timing of any consent and the availability of EU funding and what issues are identified for monitoring that can be achieved leading up to 2016 and the outcomes of the feasibility study on environmental research.

Proposed High Level Structure for R&D Management

We would welcome the opportunity to be involved in informing and commenting on the potential environmental research opportunities for the site. However as stated in our comments above we would require assurances regarding the relationship between requirements of any consent and how such requirements would be delivered and this wider research programme. This may have implications on the proposed structure; in so much as the delivery of conditions will be a compliance / enforceable related activity. The diagram may need to be amended to reflect this aspect further.

- Establishment principles

In terms of establishment principles, we welcome the consideration already provided to how the Advisory and Proposal Steering Groups may be established and operate, some of these details may be too premature and / or detailed at this stage, but we can provide further comments as the plans are developed. We would also point out that there may be opportunities also to consider environmental issues not just related to nature conservation issues (although these are likely to be key).

- Terms of Reference / Initial work on Marine Mammals and Ornithological R&D
Please note we are not able to provide any comments on these proposal as part of a R&D programme until the determination of any application, as many of these issues are areas we have identified as part of our advice on the application.

One final comment is related to the public availability of any research collected and we would recommend that all such data (analysed) is made available through an agreed process with Marine Scotland.

I trust these comments are helpful, please do not hesitate to contact myself (Erica.knott@snh.gov.uk 01738 458674) or Sue Lawrence (sue.lawrence@snh.gov.uk 01224 266517), if we can be of any further assistance.

Yours sincerely

Erica Knott
Senior Casework Manager – Offshore Renewables

From: akinninmonth@swt.org.uk [mailto:akinninmonth@swt.org.uk]
Sent: 26 March 2012 18:22
To: Andrew.Sutherland@scotland.gsi.gov.uk; MS.MarineLicensing@scotland.gsi.gov.uk
Cc: mkeegan@swt.org.uk
Subject: RE: 018/OW/AOWFL - 9: Request For Comments R & D Proposals EOWDC: 27 February 2012

Hi Andrew, thanks for sending this through and apologies for leaving it until the last minute to respond. I hadn't come across this before and in principle am supportive of the vision of the project which seeks to answer the remaining questions on the environmental impacts of offshore wind development. The testing facility for new technology is in keeping with our policy on wind farm deployment which calls for a precautionary phased approach – underpinned by excellent data, monitoring and adaptive management. Although it should be acknowledged that small-scale deployment and monitoring does not necessarily provide the information need to regulate large-scale developments.

We also believe that all research, baseline data collection and monitoring should be accompanied by effective and accurate communication of results, so it's pleasing to see requirements on dissemination included in the draft terms of reference.

The table on page 9 seems to cover the main topics – namely noise impacts of pile driving and potential changes to benthic habitats and foraging areas. One key research priority that SWT would like to see explored further is the capacity of wind farm infrastructure to increase local biodiversity by acting as artificial reefs and fish aggregation devices, which where appropriate are established concepts in ecosystem restoration.

I'd be interested to see how these various groups develop and would welcome where appropriate for SWT to be represented in some way.

Regards,

Alex
Alex Kinninmonth
Policy Officer - Living Seas
T 0131 312 4749 | M 07795220514 | W www.swt.org.uk

Harbourside House, 110 Commercial Street, Edinburgh EH6 6NF



Scottish Wildlife Trust is listed on www.everyclick.com, the search engine that helps charity. Please use [everyclick](http://www.everyclick.com) to do all your searching.

From: sarah.dolman@wdcs.org [mailto:sarah.dolman@wdcs.org]

Sent: 15 March 2012 07:04

To: MS.MarineLicensing@scotland.gsi.gov.uk

Cc: sarah.dolman@wdcs.org

Subject: RE: 018/OW/AOWFL - 9: Request For Comments R & D Proposals EOWDC: 27 February 2012

Dear Andrew

Thanks for circulating the draft R&D proposal for EOWDC.

The R&D proposal looks to be ideas rather than plans at this stage and I have no comments on most of the detail.

I'm interested in the initial work that is identified in the final table called 'description'. With a view to achieving best practise at the site, some other ideas that we would be interested to pursue include:

- 1) Alternatives to pile driving - as Jim will remember this was raised as a required priority during a number of presentations at the recent Crown Estate Workshop on Marine Mammals and Noise and could be considered to be truly innovative;
- 2) Understanding impacts on marine mammals – including desk based studies to understand individual and population level impacts (including cumulative impacts), for bottlenose dolphins and seals, as well as other nationally important species, including harbour porpoises, minke whales and white-beaked dolphins;
- 3) Understanding impacts on marine mammals – field studies to investigate and ground-truth disturbance and habitat displacement, for those species listed above. Given the existing lack of data on potential impacts on species (perhaps other than porpoise studies in some parts of Europe, recognising that results at each site are variable);
- 4) Using appropriate noise measurements to understand disturbance impacts on marine mammals;
- 5) Understanding impacts on prey species – where marine mammals are feeding in the vicinity; and,
- 6) Effective mitigation is critical. We fully support efforts to develop innovative mitigation of pile driving noise, both in the vicinity of the source to limit injury and further afield in order to limit disturbance. Limitations in existing techniques and resulting lack of certainty surrounding effectiveness need to be explicitly stated.

WDSC would be happy to participate in discussions surrounding the development of a full research plan that includes marine mammals where appropriate.

Thanks,
Sarah

www.vattenfall.co.uk/en/aberdeen-bay.htm



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