Offshore Wind Farm Developments and Research in the Moray Firth – Developers Overview

WREN Event

Thursday 30th May 2019
1. Introduction to EDPR and the Moray Firth Offshore Wind Farm Developments

2. Moray East Offshore Wind Farm
   
   2.1 Brief history of the consenting process
   
   2.2 Overview of strategic / research projects

3. Lessons Learnt
1. EDPR & Moray Firth Offshore Wind Farms
Introduction to EDPR
A global leader in the renewable energy sector

- World’s fourth-largest wind energy producer
- 11GW+ of installed capacity
- Presence in 13 markets
- 1330+ employees
- Current EDPR offshore markets: UK, France, Portugal, USA
Moray Firth Offshore Wind Farms
Moray East Offshore Wind Farm and Moray West Offshore Wind Farm

- Moray Firth Zone awarded in 2010
- Zone was divided in Moray East and Moray West
- Development of Moray East progressed first
  - Moray East – under construction
  - Moray West – pending determination
- BOWL project (end of construction) adjacent to Moray East and Moray West
2. Moray East Offshore Wind Farm
Moray East Project Overview

• 950 MW Offshore Windfarm currently under construction:
  • 2010: Development Commenced
  • 2014 Consent Awarded
  • 2017: CfD Award (lowest cost for offshore wind in the UK to date)
  • 2018: Financial Close
  • 2019: Offshore Construction Starts
  • 2021: First Generation
• 22 km/14 miles from shore at nearest point
• Cable route: 54 km offshore plus 33 km onshore
• Water depths up to 57 m/190 feet
• 100 turbines (MHI Vestas V164 – 9.5 MW)
• Largest infrastructure project in Scotland:
  • Will power the equivalent of 40% of Scotland’s households
Moray East Project Overview

Moray East OWF Project Design:

- The Project (offshore elements) will consist of:
  - Up to 100 WTGs;
  - Three distributed OSPs;
  - WTGs and OSPs supported over three-legged tubular steel lattice jacket substructures;
  - Foundations consist of 2.5 m piles of around 55 – 60 m length;
  - Inter-array and inter-platform cabling (66 kV);
  - Three export cables (220 kV) of c. 65 km;
  - Directional drilling used at landfall (near Inverboyndie).

- Onshore project elements will consist of onshore cables and onshore substation (Aberdeenshire Council area)
## Moray East Project Overview –
### Moray East OWF layout

<table>
<thead>
<tr>
<th>Relevant Parameter</th>
<th>Consented Parameters</th>
<th>Final Layout Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wind Farm</td>
<td>OfTI</td>
</tr>
<tr>
<td>Number of WTGs</td>
<td>186</td>
<td>-</td>
</tr>
<tr>
<td>Number of OSPs</td>
<td>-</td>
<td>2 AC OSPs or 4 distributed OSPs</td>
</tr>
<tr>
<td>Worst Case Scenario (WCS) of seabed impact for WTGs and OSPs (inc. scour protection area) (m²)</td>
<td>14,338,368</td>
<td>15,078</td>
</tr>
<tr>
<td>Maximum number of piles</td>
<td>744</td>
<td>32</td>
</tr>
<tr>
<td>WTG Spacing Downwind</td>
<td>1,200 – 1,720 m</td>
<td>-</td>
</tr>
<tr>
<td>Crosswind</td>
<td>1,050 – 1,376 m</td>
<td>1,128 m</td>
</tr>
<tr>
<td>Cable Length (km)</td>
<td>572</td>
<td>278</td>
</tr>
<tr>
<td>Export cabling configuration (offshore)</td>
<td>-</td>
<td>12 cables in four triplecore arrangement</td>
</tr>
<tr>
<td>Duration of Construction Activities</td>
<td>Up to 5 years</td>
<td>Approximately 3 years</td>
</tr>
<tr>
<td>Vessel Movements</td>
<td>1,355 (Wind Farm)</td>
<td>c. 530 (WCS)</td>
</tr>
</tbody>
</table>
Moray East Project Overview –
Moray East Timeline
## Moray East Offshore Wind Farm
### Overview of EIA work

<table>
<thead>
<tr>
<th>Offshore</th>
<th>Onshore</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical</strong></td>
<td><strong>Physical</strong></td>
</tr>
<tr>
<td>• Hydrodynamics</td>
<td>• Hydrology, Geology and Hydrogeology</td>
</tr>
<tr>
<td>• Sedimentary &amp; Coastal Processes</td>
<td>• Noise</td>
</tr>
<tr>
<td><strong>Biological</strong></td>
<td><strong>Biological</strong></td>
</tr>
<tr>
<td>• Benthic Ecology</td>
<td>• Intertidal Ecology</td>
</tr>
<tr>
<td>• Fish Ecology</td>
<td>• Terrestrial Ecology</td>
</tr>
<tr>
<td>• Marine Mammals</td>
<td><strong>Human</strong></td>
</tr>
<tr>
<td>• Ornithology</td>
<td>• Landscape &amp; Visual</td>
</tr>
<tr>
<td><strong>Human</strong></td>
<td>• Archaeology and Cultural Heritage</td>
</tr>
<tr>
<td>• Commercial Fisheries</td>
<td>• Socio-Economics</td>
</tr>
<tr>
<td>• Shipping &amp; Navigation</td>
<td>• Traffic &amp; Transport</td>
</tr>
<tr>
<td>• Military &amp; Civil Aviation</td>
<td><strong>Other Human Activities</strong></td>
</tr>
<tr>
<td>• Seascape, Landscape &amp; Visual</td>
<td></td>
</tr>
</tbody>
</table>
Moray East Offshore Wind Farm
Contribution to Strategic Research

Marine Mammals (2010-onwards):
• Seal Assessment Framework
• Testing of innovative monitoring kit
• Contribution to a number of scientific papers and funding of research positions
• Marine Mammal Monitoring Programme

Ornithology:
• Gull Tagging Project (2014-15)
• Project Tag (2017)

Diadromous Fish:
• Salmon and brown trout tagging (2019 onwards)

Seascape, Landscape and Visual Effects:
• Approach to assessment

Other:
• Offshore Wind Joint Industry Programme (ORJIP)
3. Lessons Learnt
Lessons Learned

• Identification of key environmental sensitivities at early stage is key.
• Complexity of assessing design envelopes sometimes challenging.
• Significant benefits of joint work with research institutions and across industry.
• Stakeholder engagement is essential – definition of key areas of uncertainties, feedback / contribution to scope of studies, discussion of results and possible applications for EIA / monitoring requirements.
• Collaboration with other organisations could result in larger (budget) research projects being delivered - benefits for wider industry.
• Responding to “bottom up” research proposals to enable research and monitoring to answer key questions rather than limited monitoring for change at a site level.
• Funding is always challenging but there are a number of options companies can pursue: partnerships with other companies / research institutions, application for public research funding, contribution to established projects.
• Regional advisory groups post-consent (MFRAG) have a significant role in supporting the dissemination of information and promoting joined up thinking to enable delivery of consent condition monitoring in an integrated way.
Thank You

CATARINA REI
OFFSHORE CONSENTS MANAGER, EDPR UK
EDPR, 5th floor, Atria One,
144 Morrison Street
EH3 8EB, Edinburgh, UK
Email: catarina.rei@edpr.com
Tel: +44 131 556 7602