

DSG(2021)C034

Pentland Floating Offshore Wind Farm



Meeting with Dounreay Stakeholder Group

21 July 2021



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Agenda

1. Introduction to Copenhagen Infrastructure Partners
2. Why Floating Offshore Wind?
3. Floating Offshore Wind
4. The Pentland Floating Offshore Wind Farm
5. Project Pathways
6. Project Design Envelope
7. Ongoing Work
8. Local Supply Chain
9. Next Steps and Project Timelines
10. Questions



Copenhagen Infrastructure Partners



COPENHAGEN INFRASTRUCTURE PARTNERS

- Strong background in offshore wind development globally, growing plans in floating and Scotland.



COPENHAGEN INFRASTRUCTURE PARTNERS



- Copenhagen Infrastructure Partners was founded in 2012.
- CIP focuses on energy infrastructure including offshore wind, onshore wind, solar PV, biomass and energy-from-waste, transmission and distribution.
- CIP is a major investor in the offshore wind sector and has significant investments in a number of offshore wind projects globally and is active through the whole project life cycle.
- Copenhagen Offshore Partners (COP) conducts offshore wind development activities on behalf of the funds managed by CIP.

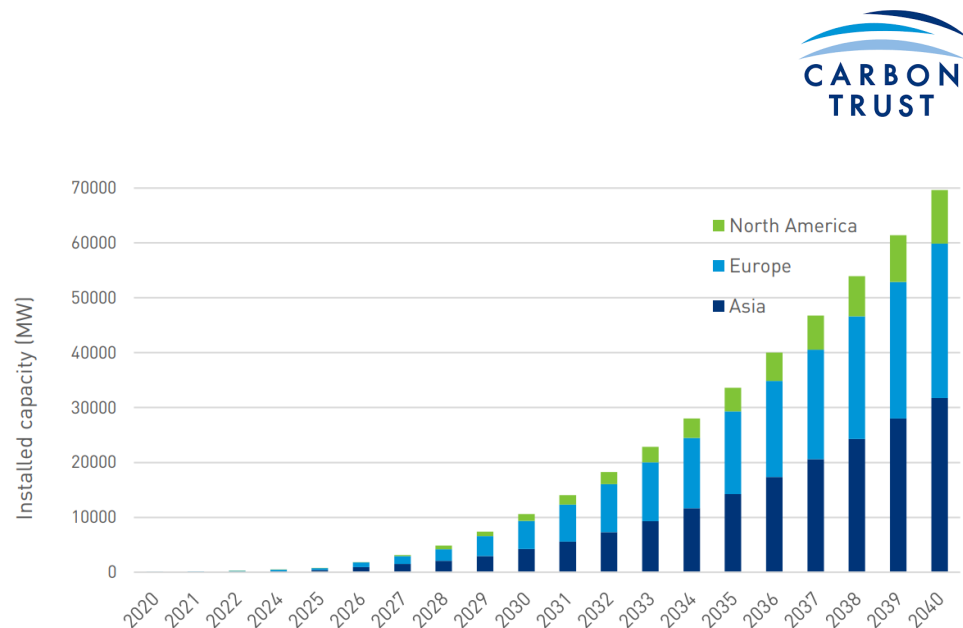


- Opened an **office in Edinburgh** in early 2020 which will act as the **global Floating Competence centre**.
- 15 local staff by the end of 2021, including employees retraining from the oil and gas sector.
- Member of the **ORE Catapult's Floating Offshore Wind Centre of Excellence**.
- Member of **Scottish Renewables**.
- Project Director Richard Copeland sits on the board of the **DeepWind** supply chain cluster.
- Participated in the **ScotWind** Leasing round in partnership with SSE and Marubeni.

Why Floating Offshore Wind?

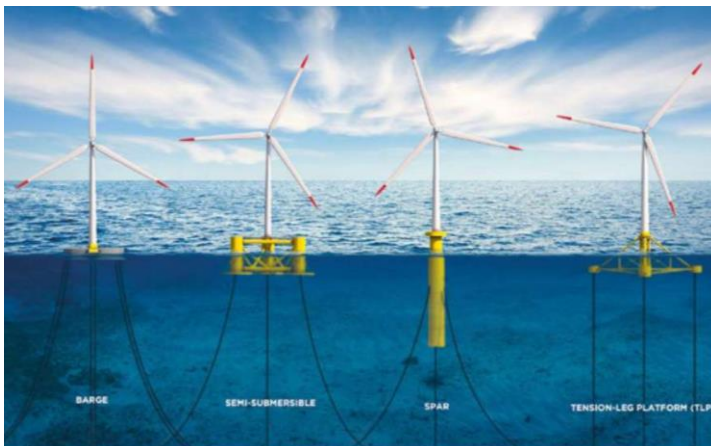
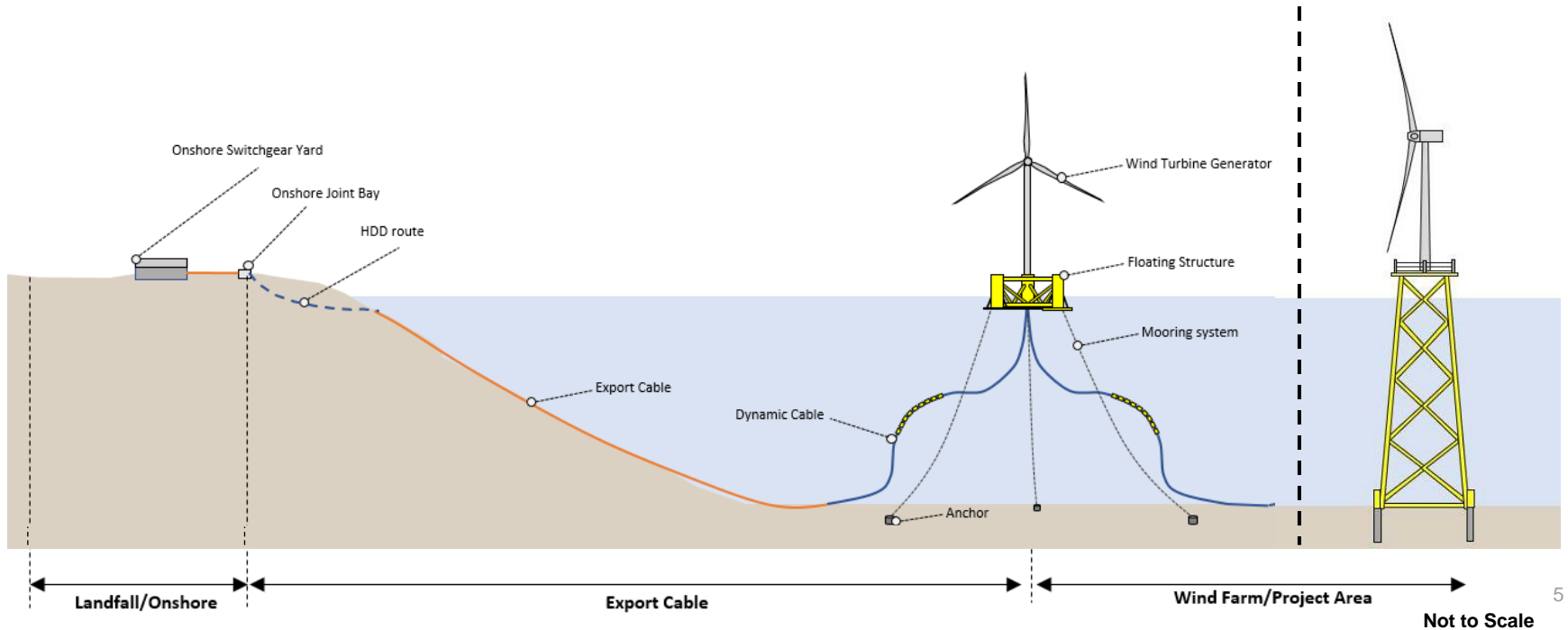
- Diversification of wind resources, economic and environmental benefits

- Current fixed bottom offshore wind structures are limited in technical and economic feasibility to water depths of around 60m but ~80% of global offshore wind resources are in water depths greater than this.
- Floating technology offers the offshore wind industry key opportunities to:
 - **Access deep-water sites** with higher wind resources
 - Be **deployed faster** with lower foundation requirement and higher energy yield
 - Cost projections suggest that **floating offshore wind can reach cost parity with fixed-bottom offshore wind during the 2020s**; a 500MW project is projected to have Levelised Cost of Electricity of 60-70 EUR/MWh in mid-2020s, and 40-50 EUR/MWh by mid-2030
 - Offer **economic and environmental benefits** compared with fixed-bottom designs due to less invasive activity on the seabed during installation
- National targets and industry forecasts suggest that **the global market potential for floating offshore wind is ~16GW by 2030 and up to 95GW by 2050**
- Significant global pipeline in both markets where fixed bottom offshore wind is not possible/limited and in markets with fixed bottom pipeline where continued decarbonization is required.
- **Potential for Scotland as first-mover to develop a strong local supply chain and reap significant benefit from the global expansion of this technology.**



Floating Offshore Wind

- Elements to a floating offshore wind farm (indicative)

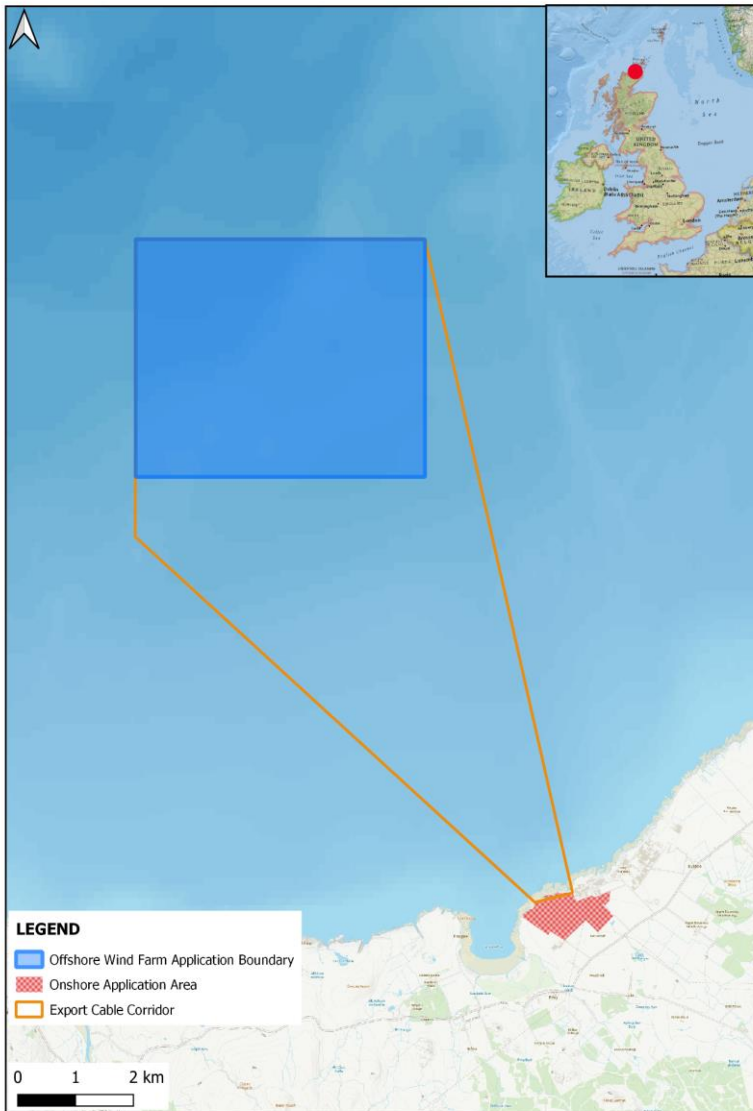


There are currently 4 main types of floating substructures that are being tested and developed.

The Pentland project is at the earliest stage of development and the floating wind technology solutions are still to be selected. The selection will be based on techno-economic and environmental selection during the preparation of the consenting process.

The Pentland Floating Offshore Wind Farm

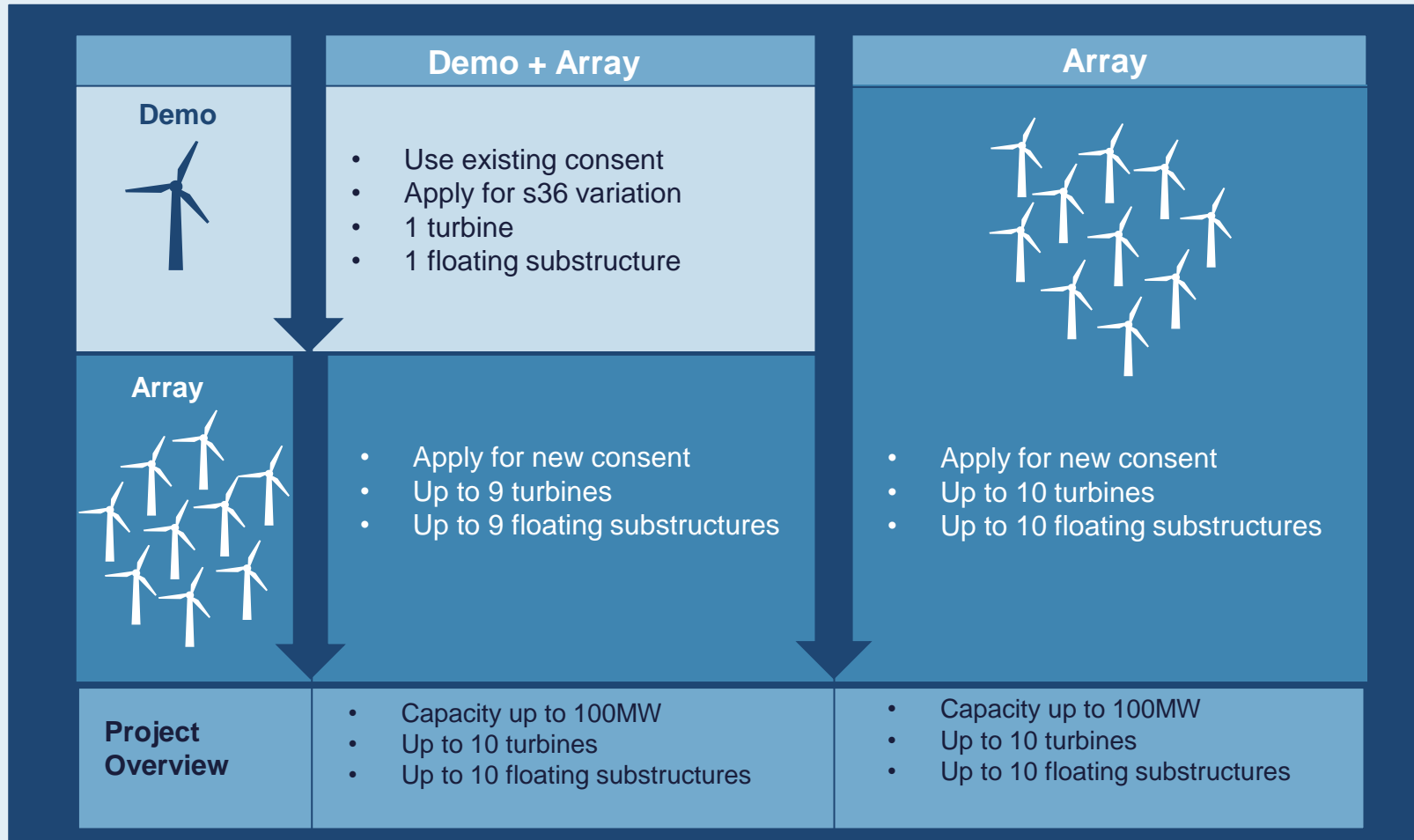
- Aim to test and demonstrate floating wind solutions - currently in early development



- The project is an update to the Dounreay Tri project that was consented by a subsidiary of Hexicon AB, a leading Swedish floating offshore wind farm developer.
- CIP will partner with Hexicon AB to ensure delivery of the project.
- The aim of the project is to **test and demonstrate floating wind technology solutions.**
- We are proposing to develop two separate elements:
 - A **demonstration project** will utilise the existing consent for the site (variation to be submitted imminently);
 - A **pre-commercial array** (up to 100MW) (the array project submitted a scoping report to Marine Scotland in December 2020)
- The demonstration project will be **located in the same Marine Licence Area** that was consented for Dounreay Tri
 - Turbines will be located ~2km further offshore than assessed in the Environmental Statement for the Dounreay Tri project.
- The **total project capacity will not exceed 100MW.**
- The project will **provide key learnings for ScotWind projects and floating offshore wind globally.**
- We are **prioritising early stakeholder engagement** and will incorporate stakeholder feedback into our project design.
- **Interested in open dialogue** on how the **project can contribute to sustainable deployment of floating wind** in Scotland and globally.

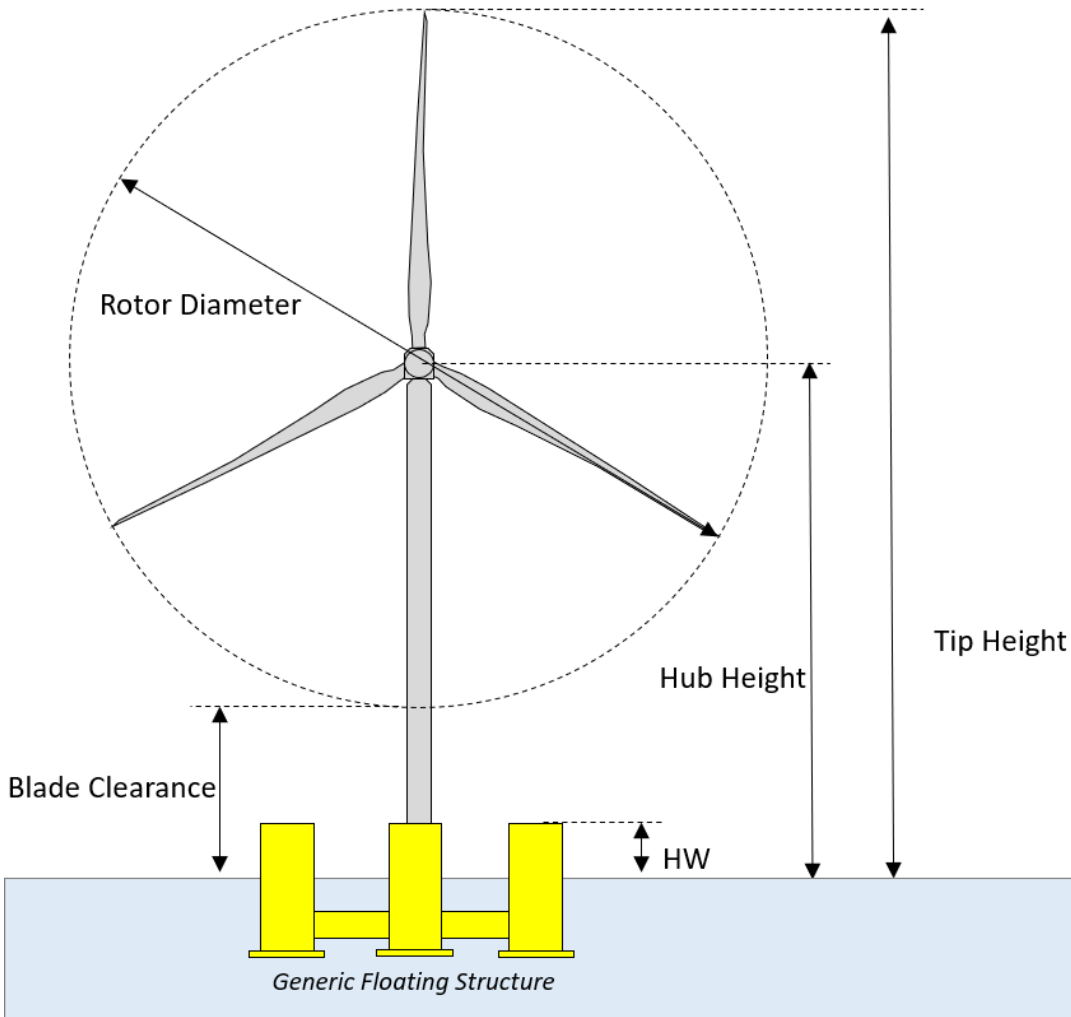
Project Pathways

- Proposing to deliver the project as a demonstration and pre-commercial array



Project Design Envelope

- Demonstrator and Array project elements



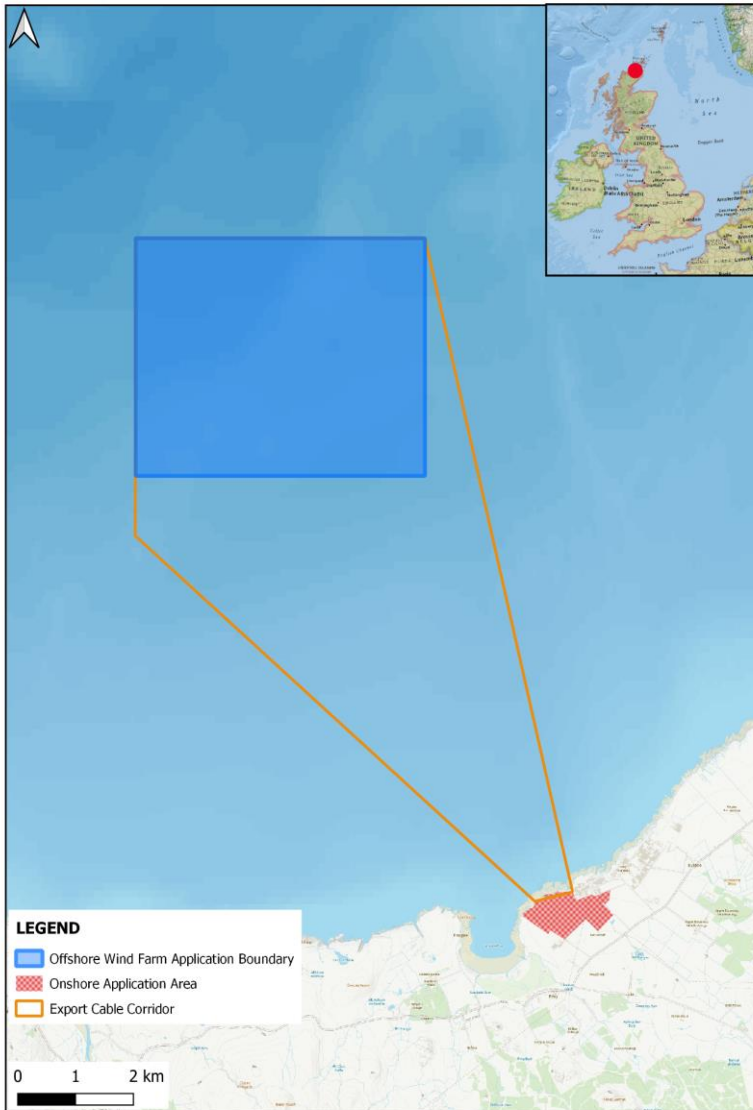
Parameter	Demo*	Array
Number of floating substructures and turbines	1	6 - 10
Rotor diameter	Up to 179 m	170 - 240 m
Upper tip height	Up to 201 m	192 - 270 m
Hub height	Up to 124 m	107 - 150 m

* Subject to successful variation

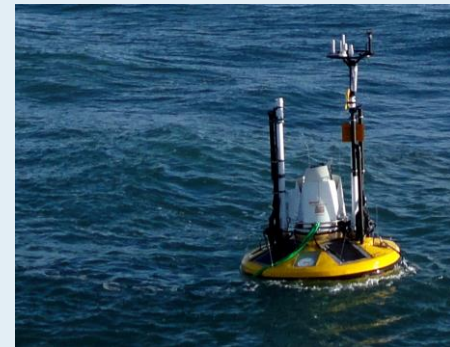


The Pentland Floating Offshore Wind Farm

- Ongoing Work



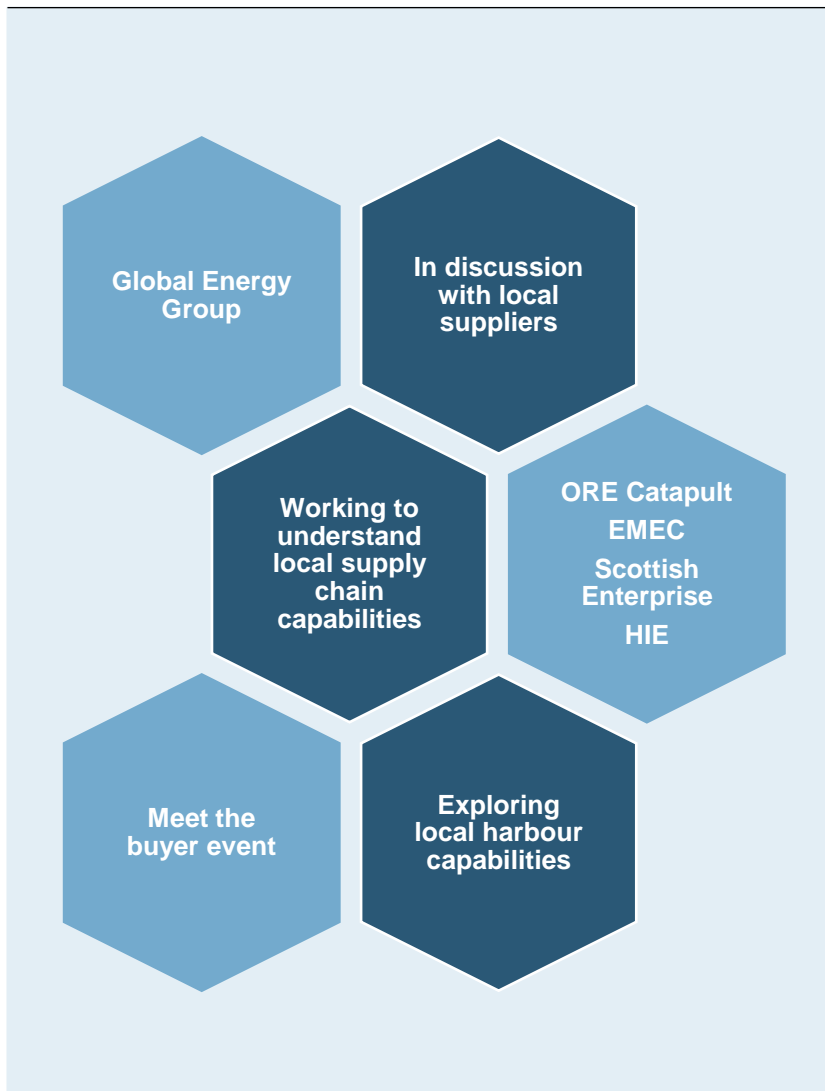
- Geophysical and environmental campaign (complete July 2021)
 - Positive engagement with local fishing industry
 - Cooperation agreements to avoid conflicts
- Geotechnical campaign (c. Q3 2021)
- Ecological and environmental surveys onshore (commenced 2021, completion early 2022)
- Onshore site investigation works (c. September 2021):
 - Boreholes, trial pits, testing of ground conditions
- Floating Lidar (August 2021)
 - Wind
 - Metocean conditions
 - Used for engineering design
- Radar vessel survey (August 2021)
 - Strathy Lighthouse
 - To ensure representative vessel activity understood



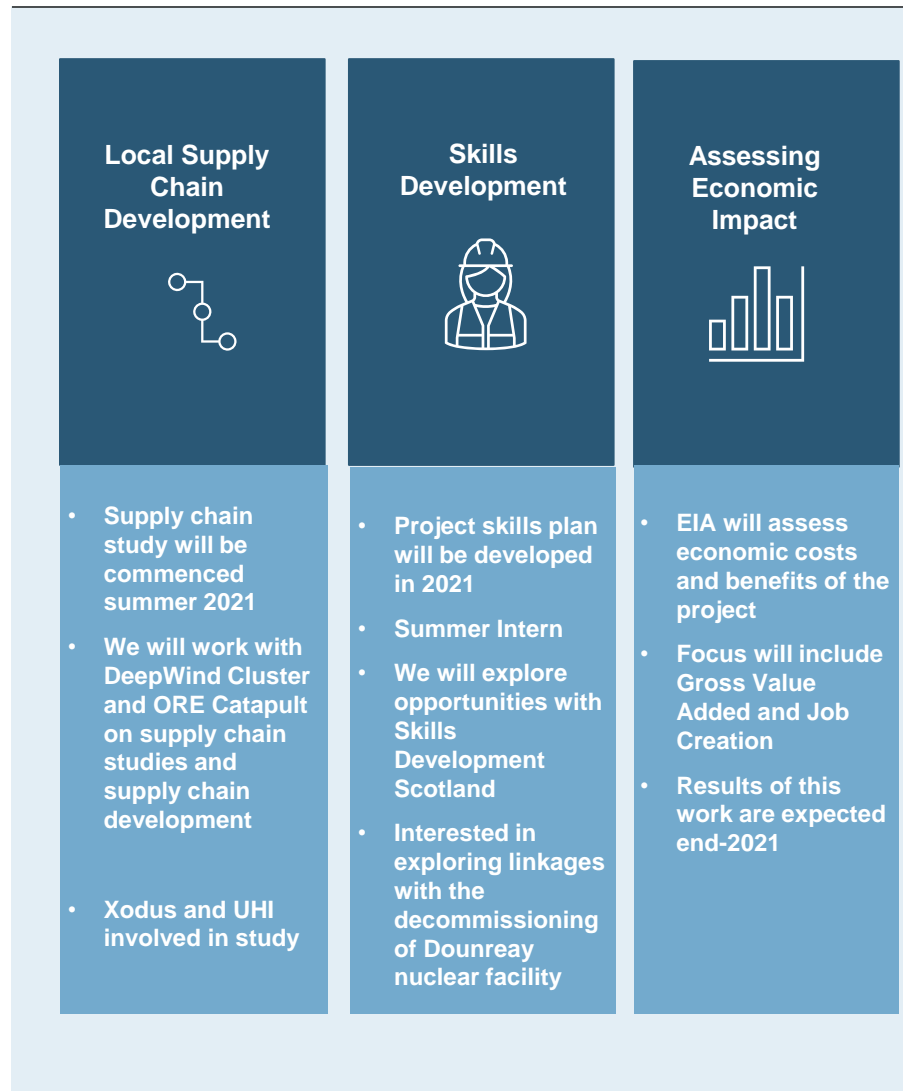
Local Supply Chain

- Focused on developing a strong local supply chain for floating offshore wind

Progress to date



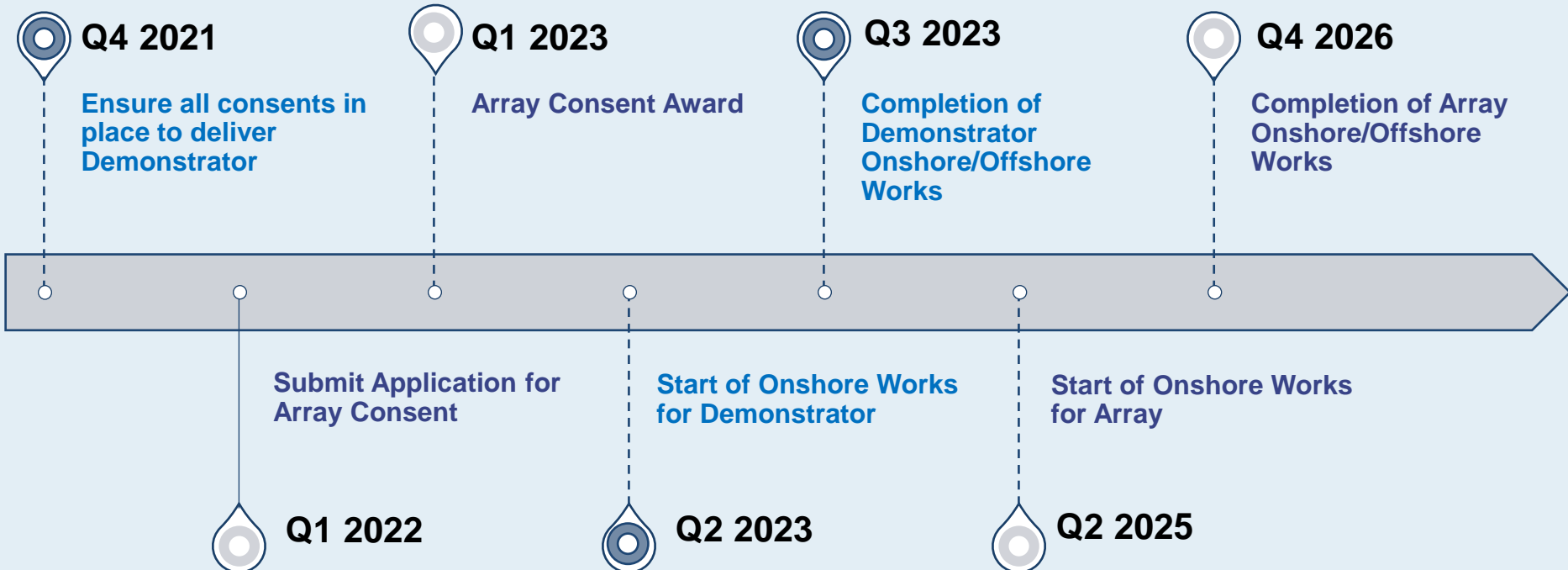
Next Steps



Next Steps and Project Timelines

- Overview of planned activities (indicative)

- Variations to allow the single demonstrator turbine to be submitted soon
- Onshore and offshore environmental monitoring to support the array application
- Public engagement events planned for the autumn 2021



Questions