HIGH TIDAL VARIATION IMPACT MITIGATION ON PRE-ASSEMBLY SITE

Equinor is a leading broad energy partner to the UK, supplying natural gas from Norway, developing domestic energy resources and generating low-carbon electricity. Equinor has been operating in the UK for nearly 40 years and aims to reach net zero emissions globally by 2050. Headquartered in Norway, the company employs 22,000 people globally, and over 650 in the UK. Equinor supports the UK economy by investing billions in crucial energy infrastructure, working with over 700 suppliers across the country.

Equinor currently powers around 750,000 UK homes through its three operational wind farms; Sheringham Shoal, Dudgeon, and the world's first floating wind farm, Hywind Scotland. In partnership with SSE Renewables and Eni Plenitude, Equinor is building the largest offshore wind farm in the world, Dogger Bank, off the Northeast coast of England, and is maturing its plans to extend both the Dudgeon and Sheringham Shoal wind farms.

Challenge Background

At the turbine and floaters' pre-assembly ports the assembly timing is critical for the operation. Due to high demand of storage and assembly areas and access to water availability, a properly executed and timely pre-assembly of floaters and turbines is needed to optimize costs and improve safety.

The Celtic Sea region has a big tidal variation. Such variation is mostly perceived at the ports in the region, which could be used for pre-assembly of turbines and floaters.
The tidal variation has a huge impact on the pre-assembly operations, as it delays the assembly capacity, the vessels' logistics and navigation and can significantly reduce the operational window of the port.

Solution Requirements

Functional Requirements	This challenge invites technologies to mitigate the impacts of tidal variation on pre-assembly sites. Proposed solutions should include an understanding of which existing port locations they could be suitable for, and which locations may be suitable for deploying the proposed technology. The biggest impacts related to tidal variation on pre-assembly ports which the proposed solution should address include (but are not limited to): • Conducting crane operations on pre-assembly • Considering the final assembly of turbine and floater is performed on the port's waters, improve assembly capacity and area available on the quayside (including interfaces between structures and installation of turbines on floaters) • Improve vessel (barges and towing ships) logistics and navigability

	• How to increase ports' operational window and reduce downtime
Technical Characteristics	Solutions should consider: • Characteristics of a 18MW turbine and floaters • Typical ports in the Celtic Sea region, including sea conditions and available space. • Cost effectiveness and ease of implementation at ports • Sustainability of materials and impacts on environment • Navigation requirements of typical installation vessels and barges • Minimum water depths that would allow for pre-assembly of floaters and turbines
Operating Conditions	• Reduce to minimum possible downtime of ports due to tidal variation and water depth • Not significantly impact on existing operations on Ports in the region • Not require significant maintenance • Not create any additional HSE risks or environmental impacts
Cost Requirements	• No immediate cost requirements foreseen. However, the solution needs to consider the cost benefit of charging the vessel offshore versus the time consumed for the vessel to return to shore for re-charging.

Market Opportunity

The Celtic Sea, due to the planned leasing round, has a significant pipeline of floating wind farm projects which will be constructed in the coming years. Due to the high tidal variation in the region, successful solutions will have significant opportunities in this area, and other global geographies with high tidal ranges.

Eligibility and Further Information

Eligibility	Entrants to this competition must be: • Established businesses, start-ups, SMEs (Small-Medium Enterprises) or individual entrepreneurs • UK based or have the intention to set up a UK base • Minimum of TRL (Technology Readiness Level) Four. See link for further detail on the TRL scale https://enspire.science/trl-scale-horizon-2020-erc-explained/
Assessment	Applications will be assessed on: • Applicability to the challenge • Innovativeness of the solution • Coherence of proposed business model and company vision

	• Feasibility and economic viability, including ability of the team to progress the solution • Development potential • Maturity of the solution • Ability to launch product and ease of implementation
IP & Commercial Route	• Existing background IP associated with a potential solution will remain with Launch Academy Applicant(s)/Participant(s). Where any new IP generation is envisaged during the Launch Academy programme, it will be subject to the mutual IP agreement of the Launch Academy Participant(s) and Launch Academy Sponsors if it is jointly developed. If new IP is developed solely by the Participant then it will remain with the Participant. • Where necessary, a non-disclosure agreement (NDA) may be signed to uphold confidentiality in the engagement between the Launch Academy Participant(s) and Launch Academy Sponsors. • ORE Catapult do not take any share of IP ownership or enter commercial ventures through the Launch Academy programme.