Department for Energy Security & Net Zero

NET ZERO INNOVATION PORTFOLIO

Cerulean Winds

Floating offshore wind (FOW) interface assembly demonstrator

CARBON TRUST | OFFSHORE WIND

CERULEAN WINDS

Project Lead: Cerulean Winds

NZIP Grant: £825,692

Innovation overview

This demonstration project's aim was to take an oil and gas sector approach to large scale floating infrastructure to achieve TRL 8 for the integrated dynamic system of the three main dynamic components, namely the floating foundation, wind turbine, mooring system and dynamic cables.

It also aimed to advance the framework and key interface points of floating offshore wind, defining a deliverable solution at scale, accelerating the maturity and cost out curve to enable commercial giga-scale developments in UK waters. Delivery of floating offshore wind farms pre-2030 provides green power to grid and supports the decarbonisation targets and timeline of the North Sea Transition Deal.

Potential benefit to the industry

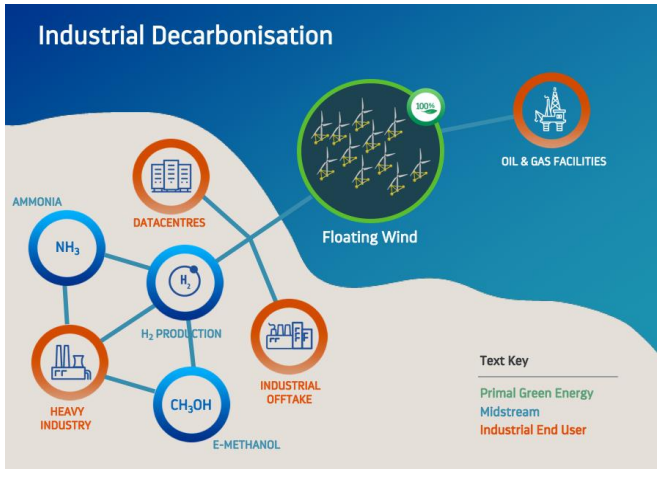
This project has the potential to help floating wind make the leap to commercial scale and significantly reduce the LCOE of such projects through delivery of their planned three 1 GW offshore floating wind projects in the North Sea.

It will support significant carbon emission abatement in the UKCS through industrial decarbonisation and provide a clear path to support supply chain investment.

> "Through the development of our Aspen, Beech and Cedar projects, Cerulean Winds aims to deliver floating offshore wind at scale pre-2030. This work has supported key areas of the design development including the complex dynamic nature of floating offshore wind.
>
> Mature project definition, with support from our Tier 1 consortium partners, has allowed key supply chain engagement and assessment against a framework of what is required for delivery of Floating Wind at scale in the UK. This project definition provides a clear reference case to the supply chain to support inward investment, supporting a ramp up of local capabilities, maximising the potential benefit floating offshore wind can bring to the country."

Jonathan Southee

Head of Engineering, Cerulean Winds



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Results

Whole system design

This project supported Cerulean to bring together a whole system design approach. Supported by consortium partners including NOV and Siemens Energy, work was delivered on the floating substructure, dynamic cables and moorings, as well as framing the T&I logistics. Detailed front end design and installation plans were prepared, laying the groundwork for the full development and construction of the wind farms.

Tri-floater model testing and certification

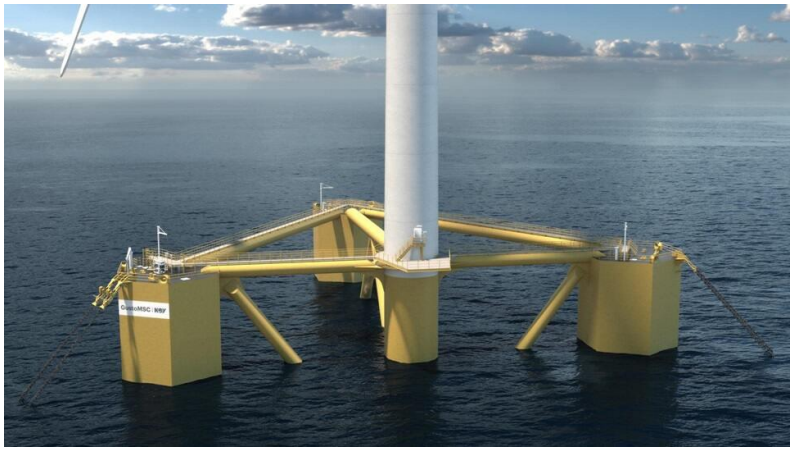
Model wave tank testing was carried out on NOV's 15 MW scalable tri-floater design, and certification was received during this project.

Supply chain capabilities assessment and investment case

Studies carried out by Cerulean and NOV for this project showed that fabrication and assembly in the UK is feasible, but that investment is required to support the scale required for GW size FOWFs. A total of 37 supply chain companies across fabrication, assembly, installation and port services were engaged to assess their capabilities and capacities and planned investments to support the future floating wind pipeline. This gave a better picture, providing enhanced clarity to developer and supply chain companies

INTOG (Innovation and Targeted Oil & Gas) Submission

Cerulean were successful in being awarded three INTOG leases which materially advances the timeline of FOW at commercial scale in the UK.



What happens next?

Cerulean is working on delivering their three INTOG Floating wind projects (Aspen, Beech and Cedar) in the Central North Sea.

Cerulean Winds, established in 2020, is leading the development of the UK's offshore renewables grid. This includes the creation of one of the world's largest offshore wind farms delivering green energy to industrial users and providing significant export supply.

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