Department for Energy Security & Net Zero

NET ZERO INNOVATION PORTFOLIO

Marine Power Systems

Floating offshore wind demonstration programme

CARBON TRUST | OFFSHORE WIND

MARINE POWER SYSTEMS

Project Lead: Marine Power Systems Ltd
NZIP Grant: £3,499,999

Innovation overview

Marine Power Systems has developed a modular, flexible floating platform technology that can harness ocean wind energy at grid scale. Its design offers exceptional stability and energy efficiency, while reducing system mass for lower costs compared to similar solutions. The platform's modular nature makes it straightforward to assemble, deploy, and maintain, supporting local content delivery through a decentralised logistics model. These features help utility-scale developers balance cost reduction with boosting local economic benefits, while accelerating large-scale deployment.

Potential benefit to the industry

Marine Power Systems is developing a platform technology for GW-scale wind farms in deep waters, unlocking 80% of the untapped global coastal resource. Positioned for global deployment; in the UK alone, benefits will be realised through a drive in job creation, exports, and revenue while supporting Net Zero goals and energy independence. Beyond Marine Power Systems, job growth will extend to the wider supply chain, with UK ports diversifying to support floating wind platform manufacturing. With its leading technology, Marine Power Systems is forecast to generate over £1bn in revenue by 2032 alone.

> "The floating offshore wind sector is at a pivotal juncture, with progress accelerating globally, particularly in MPS's key markets: the UK, EU, and SE Asia. While farm sites such as the Celtic Sea and ScotWind are in the process of securing consents and support mechanisms such as CfDs and infrastructure funds are being utilised to ports and supply chain; the identification of a scalable technology remains essential to unlocking the floating offshore wind industry commercially. MPS's best-in-class technology will drive significant cost reductions and provide an optimal solution for industrial-scale farms, positioning us to capitalise on this global opportunity.

Dr Gareth Stockman
CEO, Marine Power Systems Ltd

Results / Findings

Key findings include:

Manufacture suitability

- A 25% reduction in weight, cutting manufacturing and deployment costs (less steel, smaller cranes and vessels).

Operational improvements

- Operational improvements by installing turbines offshore, reducing risks and speeding up the project timeline.

Simplified logistics

- Fewer logistical challenges with wet storage and mooring many platforms in congested marine areas, along with lower deployment costs than transporting platforms with pre-installed turbines over long distances.

Simulation testing

- Advanced simulations have enabled rapid design optimisation, integrating fatigue assessment from the concept stage - a crucial factor in marine engineering that traditional approaches often address too late in the design phase.

Ocean basin testing

- Design has been validated at the state of art FloWave ocean basin in Edinburgh and was shown to perform extremely well throughout the robust test parameters.

Benchmarking

- Benchmarking against industry standard systems, e.g., SemiSubs, has revealed significant reductions in motion and cost. These motion reductions enhance system yield and accessibility, minimising downtime and costs while maximising energy production.

Marine Power Systems is revolutionising the capture of ocean wind energy with flexible, modular technology that enables efficient large-scale floating offshore wind.
Their PelaFlex platform supports rapid deployment and maximises local content through existing supply chains. With high stability, low mass, and zero tilt, it enhances energy yields and simplifies installation using standard vessels. This increases operation and maintenance windows and allows for multiple launch options.

Contact information

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What happens next?

The project aims to achieve a detailed design of the PelaFlex platform that meets technology qualification standards and third-party validation, providing assurance to farm developers to ultimately select it as the preferred technology solution for their commercial projects.

Achieving this will support other benefits:

- Allowing the UK to achieve export of a British-manufactured floating offshore wind platform
- Long term sustainability of the project, both increasing and retaining UK jobs
- Contribution to Net Zero goals

Funded by: Department for Energy Security & Net Zero

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