Department for Energy Security & Net Zero

NET ZERO INNOVATION PORTFOLIO

Buoyant Production Technologies

Demonstration of increased UK and regional fabrication opportunities from the deployment of BPT's spar buoy hullform for floating offshore wind (FOW)

CARBON TRUST | OFFSHORE WIND

Buoyant Production Technologies

Project Lead: Buoyant Production Technologies

NZIP Grant: £238,724

Innovation overview

Buoyant Production Technologies (BPT)'s patented spar buoy hull provides the offshore motions performance benefits of a deep-draught spar unit, whilst offering the facility for vertical launch, ballasting, and tow to field – with significant cost savings compared with traditional spar hullforms due to the simplified installation process, and compact design.

For a floating substation application, where offshore motions performance is a critical factor in hullform suitability, the spar buoy hullform offers high performance whilst minimising the associated LCOE impact of the unit.

Benefit to the industry

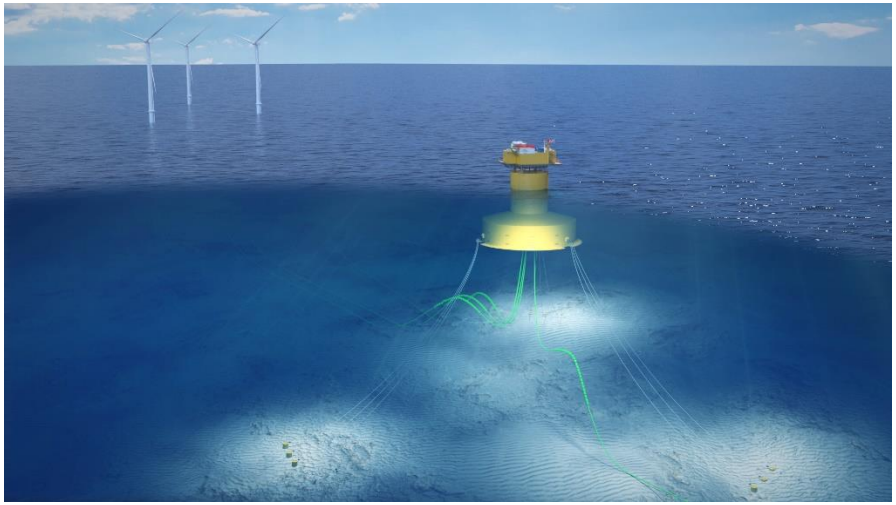
BPT's novel hullform and ballasting methodology provides an offshore unit that can be delivered by UK fabrication facilities, where fabricator quaysides are typically at a shallow draught.

For UK FLOW projects, maximising local content for UK and regional benefit is a key driver of success. Consequently, the opportunity to fabricate the hull of a floating substation locally is a key opportunity to maximise the attractiveness of future commercial-scale FLOW developments in the UK.

> "Floating substation technology is a key building block in reducing the LCOE of future FOW developments.
>
> By demonstrating the motions performance, novel ballasting methodology, and feasibility of constructing the unit in the UK, we have made a significant step forwards in delivering this technology for deployment on future UK FOW projects."

David Steed

General Manager – Buoyant Production Technologies



Results / Findings

Motions performance

The correlation between the BPT's numerical model and the model tests observations provide confidence in the unit's performance in extreme offshore environments experienced around the UK.

Ballasting operation

The ballasting procedure developed by BPT for the spar-buoy hullform was tested at model scale and found to provide a controlled means of ballasting the unit from its shallow launch draught to an operational condition.

UK fabrication analysis

UK fabrication of the BPT FOSS is feasible as several yards have the experience, know-how, and facilities required for this size of structure.

The UK fabrication capability is stronger in the north of the country. Southern fabricators are likely to be able to offer some block fabrication capabilities, but are unlikely to be able to take on the whole contract.

UK fabricator facilities do not yet maximise the use of automated fabrication facilities. As such, fabricating the BPT FOSS in the UK is likely to carry an economic penalty.

Conclusion

The BPT Spar Buoy provides a robust technical solution to support substation equipment on future FOW developments in the UK. With the opportunity to construct the unit in the UK, it offers a local content opportunity for developers.

What happens next?

BPT is actively developing an ocean-scale demonstration unit to test the technology features at full-scale and qualify the systems to TRL 6, for commercial use.

The project is due to complete within 2025.

Headquartered in Southampton, BPT is a wholly owned subsidiary of Crondall Energy Consultants Ltd.

Since 2018, BPT has been actively developing compact offshore floating system designs for the offshore energy industries and has developed the floating NUI hullform, a compact unit design for small-scale payloads operated on an unmanned basis in the offshore environment.

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