Grimsby to be offshore hydrogen production test bed as £4.5m project location revealed

Grimsby has been selected as the location to test renewable hydrogen production within offshore wind farms.

The £4.5 million European-backed project, spearheaded by Ørsted and ITM Power, will see the technology developed and demonstrated alongside the company's East Coast Hub.

An innovative marinised electrolyser system, designed to form part of a turbine, will be developed at Royal Dock – while the potential to use pipelines to transport hydrogen to shore will also be explored.

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Hydrogen is seen as the key fuel to decarbonise heavy industry and heavy transport.

Ørsted, ITM and Element Energy – a project management specialist in the consortium – are already partners on Gigastack, the land-based development involving offshore wind

power being harnessed by the onshore grid connection at North Killingholme.

Siemens Gamesa – also on board for technical expertise – has been Ørsted's manufacturer of choice for the ever-larger turbines it operates and maintains from the town. Grimsby was chosen for the project because of the key players' strong presence with world-leading credentials, with the region's industrial cluster emissions – the highest in the UK – also flagged.

Named Oyster, it is primed to deliver a megawatt-scale pilot, and is fully funded by the Fuel Cells and Hydrogen Joint Undertaking, a public-private partnership of the European Commission. It comes just weeks after the UK Hydrogen Strategy was launched.

Offshore wind can power hydrogen production to clean up heavy

industry, transport and heat.
Duncan Clark, head of UK region for Ørsted, said: “The combination of offshore wind and renewable hydrogen production holds game-changing potential to decarbonise otherwise hard to abate sectors, and as the largest offshore wind company in the world, we are exploring offshore hydrogen production as a future, supplemental way of getting large amounts of renewable energy, generated from plentiful offshore wind, to where it is needed.

“Just as with scaling-up offshore wind, early lessons from projects like this can then be deployed across the region and around the world.”

Sheffield-based ITM’s separate work with Phillips 66 Humber refinery and ’s Ørsted land-based assets is already being taken forward at pace. It will now be responsible for the development of the electrolyser system and the electrolyser trials, while Ørsted will lead the offshore deployment analysis, the feasibility study of future deployments, while supporting the design.

Dr Graham Cooley, chief executive of ITM Power, said: “Renewable hydrogen is the cleanest fuel available to us today. Utilising offshore wind energy, and generating renewable hydrogen using water in the process of electrolysis, offers a route to be able to decarbonise the entire energy system. ITM Power is delighted to be supporting this move towards a greener, cleaner future.”

A compact electrolysis system in keeping with a turbine profile that can withstand harsh offshore environments and has minimal maintenance requirements, while still meeting cost and performance targets that will allow production of low-cost hydrogen, is the aim – with a need for desalination and other water treatment to make seawater use the feedstock alongside the electricity generated.

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Bart Biebuyck, executive director of FCH JU, said: “In order to meet the challenging EU Hydrogen Strategy target of 40GW renewables-fed electrolysers by 2030, off-shore wind parks will play an essential role. Depending on local conditions it may be optimal to move the electrolysers offshore and transport hydrogen rather than electricity to shore.

“The FCH JU is proud to support the Oyster project as a

stepping stone for off-shore electrolysers through the development of a fully ‘marinised’ MW-scale electrolyser to be tested right next to the sea front and therefore contribute continuously to developing technologies for a climate-neutral future.”

It is the latest step towards a wider Humber hydrogen economy, with both Uniper and Equinor developing production pan-Humber, with the latter and SSE behind the world’s first at-scale hydrogen power station proposed for Keadby. ABP’s Port of Immingham also working towards fuel-switching.

Two major storage projects are also being advanced at Aldbrough, East Yorkshire, and offshore at Rough.

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