

TetraSpar Demonstrator, the world's first fully industrialized floating offshore foundation, is now commissioned and in operation

- The floating wind foundation TetraSpar Demonstrator owned by Shell, TEPCO RP, RWE and Stiesdal has been successfully connected to Norway's grid
- The floating foundation was towed from Denmark to Norway in July. It has now been fully commissioned and is producing power in automatic, unattended operation
- Concept offers leaner manufacturing, assembly, and installation process with lower material costs

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The pioneering floating wind project, TetraSpar Demonstrator, is commissioned and in operation, anchored in place at 200 m water depth off Norway's coast. The project will now enter its test phase where data on the performance and characteristics of the TetraSpar floating foundation will be captured and analyzed to pave the way for commercial-scale floating wind projects.

Earlier this summer, the TetraSpar Demonstrator reached its destination at the METCentre test site after a tow of 360 nautical miles from the port of assembly in Grenaa, Denmark.

The commissioning of the 3.6 MW Siemens turbine is the last in a string of milestones for the TetraSpar Demonstrator:

- Completion of the factory manufacturing of the components for the world's first industrially manufactured floating offshore foundation
- Fast assembly of the modules at the quayside, requiring no welding and no special port facilities
- Launch using a semisubmersible barge, followed by rapid turbine installation using an ordinary onshore crane
- Safe deployment of the keel when towed to location of sufficient depth, making the TetraSpar Demonstrator the world's first spar foundation capable of deployment from an ordinary, shallow-water port

The demonstration project has shown that Stiesdal's 'Tetra' concept remains on target to offer important advantages over existing floating wind concepts, with the potential for leaner manufacturing, assembly, and installation processes, and with lower material costs.

Henrik Stiesdal, Chairman of the board of directors of TetraSpar Demonstrator ApS, said: "This is a huge milestone for the project. First and foremost, we are happy to have completed all phases of the project without any significant safety incidents, even though we have deployed a very innovative project with a range of world's first elements. The deep experience of our project partners has been invaluable in this regard. Next, we are obviously very pleased that the new technologies, a few years ago only ambitions and design proposals, have now come to fruition. All indications are that our key target, to accelerate the industrialization of floating offshore wind, can actually be met, not only at prototype level but at large scale."

Thomas Brostrom, Senior Vice President Renewables at Shell said: "We are extremely proud to have reached this important milestone and to have contributed to the realization of a truly innovative floating concept. Shell is committed to further develop the floating wind industry globally by providing technical and financial support to promising concepts such as Tetraspar. Ultimately, we hope to deploy floating wind technology globally and at large scale to enable further decarbonization of our customers' activities and for society as a whole."

Seiichi Fubasami, President of TEPCO RP, said: "There are high expectations throughout the world for floating offshore wind farms. One of the most challenging endeavors underway is the TetraSpar floating foundation demonstration project. Each stage in the process, from manufacturing and assembly, to launch and deployment, has done well, and we are very excited now to have the demonstrator in operation, thereby reaching an important milestone towards commercial operation of the TetraSpar. In Japan we expect more floating offshore wind farms to be built from 2030 and onward as we aim for realization of carbon neutrality in 2050. The TetraSpar concept can be utilized in Japan's natural conditions and enables the easy construction of regional supply chains thereby playing an important role as we aim to transition to renewable energies as baseload power sources. This is a promising new technology for the future and we expect the TetraSpar floater to perform well during operation off the coast of Norway over the next couple of years."

Sven Utermöhlen, CEO Offshore Wind of RWE Renewables, underlined: "This project has been both challenging and inspiring. The spark of genius with the TetraSpar concept is its industrialized manufacturing and assembly methodology, which we think is crucial for long-term cost reduction. Our deep involvement in this project means we have now gathered first-hand evidence about how this approach can be scaled up to commercial projects. This project has taught us more crucial lessons than we could have ever expected, and it has been great to work so collaboratively with our project partners to safely deliver such an innovative technology. It has been particularly interesting to see how important it is to transfer RWE's experience in seabed-fixed offshore wind into our floating projects. This project's success motivates us to keep on delivering cutting edge innovation."

The upcoming test phase will provide the four partnering companies with important knowledge and opportunities to further refine the TetraSpar technology. The partners will make full use of the results obtained to expand the possibilities of offshore wind power and thereby contribute to the realization of a clean and sustainable carbon-neutral society.

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Press release

About Shell Renewables and Energy Solutions

Shell Renewables and Energy Solutions is building an integrated power business that will provide customers with low or no-carbon and renewable energy solutions. The business we are building spans trading, generation and supply and offers integrated energy solutions – from hydrogen, to solar, wind and electric vehicle charging – at scale, while using nature and technology to capture emissions from hard-to-abate sectors of the energy system.

About TEPCO RP

TEPCO RP is a wholly owned subsidiary of Tokyo Electric Power Company Holdings, Incorporated ("TEPCO Holdings"), the largest power company in Japan. In April 2020, TEPCO RP took its first steps as a company dedicated solely to the renewable energy generation business, the operation of which it assumed from TEPCO Holdings. For many years, TEPCO RP has used a firm business model that covers everything from the planning and construction to the operation & maintenance of hydroelectric and wind power generation facilities. The total capacity of the company's hydroelectric, wind, and solar power facilities is approximately 10 gigawatts, and our technical prowess has enabled us to maintain the largest amount of facilities in Japan. In order to seize the significant business opportunities inherent in the global trend towards decarbonization and meet the growing need for CO2-free energy, we aim to newly develop approximately 6 gigawatts to 7 gigawatts of power generation facilities within and outside of Japan by FY2030, and we will promote the transition to renewable energies as primary energy sources. In the area of wind power generation, we have performed demonstration project on Japan's first bottom fixed wind power plant, located off the coast of Choshi, and put this demonstration power plant into commercial use. TEPCO RP will promote the domestic and overseas use of renewable energies and contribute to the creation of a clean and sustainable, decarbonized society by harnessing earth's natural resources to the best of our ability in order to provide a stable supply of electricity at low cost.

About RWE

RWE is leading the way to a green energy world. With an extensive investment and growth strategy, the company will expand its powerful, green generation capacity to 50 gigawatts internationally by 2030. RWE is investing €50 billion gross for this purpose in this decade. The portfolio is based on offshore and onshore wind, solar, hydrogen, batteries, biomass and gas.

RWE Supply & Trading provides tailored energy solutions for large customers. RWE has locations in the attractive markets of Europe, North America and the Asia-Pacific region. The company is responsibly phasing out nuclear energy and coal. Government-mandated phaseout roadmaps have been defined for both of these energy sources. RWE employs around 19,000 people worldwide and has a clear target: to get to net zero by 2040. On its way there, the company has set itself ambitious targets for all activities that cause greenhouse gas emissions. The Science Based Targets initiative has confirmed that these emission reduction targets are in line with the Paris Agreement. Very much in the spirit of the company's purpose: Our energy for a sustainable life.

About Stiesdal

Stiesdal A/S is headquartered in Odense and has locations in Give and Copenhagen. The company operates four subsidiaries, each with a focus on their own green technology:

Stiesdal Offshore Technologies has developed the modular floating offshore wind turbine foundation Tetra, which can be produced faster and cheaper than other solutions on the market.

Stiesdal Storage Technologies has developed the energy storage solution GridScale, which can store electricity in the form of heat in crushed stone. The solution offers longer storage time than lithium-ion batteries, and an agreement has been entered into with the Danish energy group Anel to install the first demo project in Rødby, Denmark, in 2022.

Stiesdal PtX Technologies has developed the hydrogen technology HydroGen, which is a new type of electrolysis system that can convert electricity to hydrogen cheaper than other electrolysis technologies on the market. The first demo project is expected to be built early 2022.

Stiesdal Fuel Technologies has developed the SkyClean technology, which can produce CO₂-negative fuel for aircraft. This is done through pyrolysis where biomass is converted into biofuel for air transport while CO₂ is captured and stored from the atmosphere.