

Press release!

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## **Wave energy concept shows robustness, strength and flexibility**

***New report gathers technical knowledge behind the Crestwing concept from pool testing, offshore testing at Hirsholmene and simulations of future plant size and location***

One of the biggest hurdles for Crestwing is achieved. The prototype Tordenskiold has passed two offshore tests without significant wear or damage. The plant was pulled ashore autumn 2020 after a total of 14 months at sea. NIRAS has since worked on a detailed technical report on the wave energy concept, based on data from previous pool tests, detailed data from the offshore tests and simulations.

Niels Jørgen Hyldgaard Vittrup, senior project manager at NIRAS, has followed the Crestwing project closely since 2017: - After seeing the plant and being involved in the entire test and analysis process, Tordenskiold and the concept itself seems like a technique that should be worked on constructively to achieve the goal of commercial plants, he says and continues:

- I am fully convinced that the implementation of wave energy in the energy sector has great energy- and growth potential. In this context, I consider the design of a Crestwing plant in relation to the construction, where the two barges almost glue themselves to the surface of the water.

One of the things NIRAS finds interesting about a Crestwing plant is the simple construction with two hinged barges designed and constructed based on existing knowledge from the shipbuilding sector. The machine and power transmission system as well as the generator and monitoring systems are also based on already well-proven and available techniques.

Crestwing's board is also satisfied with the report and the work put into the project:

- We are in a good development process, which I am sure will bring us forward. It is an important milestone that we have passed the mechanical part of our machine. Now there are other tasks and challenges that we must solve. It just means that we continue our development work a little longer, says a confident chairman of the board, Peter Høstgaard-Jensen and continues:

- If we succeed in our plans, it means that we can have a commercial vessel ready in 2024, where we are considering a location in Norway.

One of the challenges that Crestwing unfortunately did not succeed with during the offshore tests with Tordenskiold was to demonstrate the very positive efficiency curve that previous pool tests have shown. This was partly because the wave environment at Kattegat did not provide enough energy, and that the generator at the plant was too small, and based on the data obtained, it was not possible to calculate the correct size.

To continue, Crestwing will go back to pool testing at the Danish Hydraulic Institute (DHI), and at the same time they are collaborating with ABB. This collaboration is to ensure that they get the best possible, developed PTO system both for the further tests of the prototype Tordenskiold and an upcoming full-scale plant. ABB will also oversee the data collection at the next pool tests at DHI in May.

The data Crestwing has collected through the 15 years of development was made available to NIRAS, who have undertaken the task of its analysis. The technical report from NIRAS gathers the most important information from tests in wave pools with test models at respectively Danish Hydraulic Institute (DHI) in 2010 and Aalborg University (AAU) in 2008 as well as data from the 14-month offshore test and testing with the prototype Tordenskiold located in the Kattegat near Frederikshavn, as well as simulations using data from previous pool tests.

Request the report by sending an e-mail to [info@crestwing.dk](mailto:info@crestwing.dk)

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Caption:

The Tordenskiold prototype is towed by a single tugboat after a total of 14 months of offshore testing in the Kattegat.

Crestwing has gained useful knowledge about issues such as:

- Tordenskiold has shown its ability to withstand the marine environment without significant wear or damage, which demonstrates a strengthening of the design concept's robustness. However, a test phase in the North Sea will expose the plant to more extreme conditions than those found in the Kattegat Sea.
- Towing the system in place in the Kattegat has proven to be straightforward and can be done in a few hours with a single tugboat. The coupling to and from its elastic mooring has been achieved several times without problems. In addition, the mooring system has worked as expected.
- Analysis of movements of the Tordenskiold plant at sea, has shown that it follows the movement of the waves as historically predicted. This shows that a Crestwing hinge-pontoon concept for electricity production is possible on plant size at the scale of the Tordenskiold, when combined with the Seaflex mooring system.