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Startup race for offshore wind: Believes to have found a solution without the need for billions of subsidies

Harald Berglihn

The development of two planned offshore wind farms in the North Sea will may cost the Norwegian state about NOK 100 billion. Technology entrepreneur Per A. Vatne believes it can be done completely without subsidies.

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This is how the technology entrepreneurs Per A. Vatne (left) and Pål Norheim envision the combination of a traditional wind turbine and a small power plant inside the column powered by wave power. (Photo: Stationmar/Harald Berglihn)

The government has opened subsidies of NOK 23 billion to the developers of the planned bottom-fixed offshore wind park Sørlige Nordsjø II. The development of floating offshore wind on the Utsira field will cost taxpayers over three times more, according to calculations from DNV this summer, with an estimate of NOK 80 billion in subsidies.

Now the technology entrepreneur Per A. Vatne believes that he has found a solution that could mean that the development of offshore wind can be done without government subsidies.

A game changer?

Vatne has been involved in technology development in the drilling equipment industry since the 1970s, among other things together with Bjarne Skeie. In short, he has developed a concept that combines wave power, hydropower and wind power, where wave power will lift water 20 meters up to a reservoir that encloses the column on which the wind turbine stands. From there, the water will fall into a traditional small power plant inside the column.

- Preliminary analyzes based on wave data out in the North Sea indicate that wind turbines with this technology will be able to double electricity production, says Vatne.

- In addition, the hydropower plant will produce electricity even when there is no wind, as far out at sea there are almost always waves. I think this is a key element that could become a game changer in the development of offshore wind, he says.

Together with partner Pål Norheim (66), also with over 40 years of experience in the oil equipment industry, he has established the company Stationmar. Here they have also brought in another veteran from the industry, Morten Steen Martinsen, as chairman.

Per A. Vatne (left) and Pål Norheim in the company Stationmar in Kristiansand have developed a wind turbine at sea that utilizes wave power to pump water so that it also becomes a small power plant in the same area. (Photo: Harald Berglihn)

- I think it is a very exciting idea and approach to build wave power into an existing structure. It is about both costs and income, says Arvid Nesse. He heads the test center for floating technology outside Karmøy, and is also head of the industry organization Norwegian Offshore Wind.

He says that in the end it is all about reducing the cost in kroner per kilowatt hour, and that it is good that small technology companies are coming forward with good ideas.

Arvid Nesse, head of the industry organization Norwegian Offshore Wind, believes it is a good idea to combine wind and wave power at sea. (Photo: Marie von Krogh)

Harald Dirdal of the company Ny Energi, initiator of the wind power consortium Norseman Wind, thinks the concept from Stationmar is very interesting.

- Especially because it is based on known technology. The key is that you utilize the existing structure and potentially increase the degree of utilization in cables and transformers. This is expensive infrastructure that is typically only used 50 percent of the time with traditional offshore wind turbines. By combining wave power and wind power, it is likely that the degree of utilization will increase, so it is clear that this is very interesting, especially for a development as far offshore as Sørlige Nordsjø II, he says.

Race

It will probably cost at least NOK 100 million to build a full-scale pilot to test that the technology works at sea. Neither Vatne nor Norheim have money after Stationmar has so far spent around NOK 25 million, mainly on the technology that neutralizes the wave movements in floating offshore wind turbines.

The small technology company in Kristiansand is far from alone in developing new ideas for offshore wind.

- In recent years, over 200 offshore wind projects have received support from us, says Eli Wærum Rognerud, head of strategic initiatives at Innovation Norway.

- We gave at least NOK 80 million to finance offshore wind projects in 2022. The Research Council also gave NOK 80 million and Enova 32 million, she says, adding that Innovation Norway also spent NOK 26 million last year on export services related to offshore wind, such as international exhibitions , delegations, export programmes, market advice and marketing.

- In general, we are experiencing a strong increase in inquiries about offshore wind, both about financing and, not least, advice, says Wærum Rognerud.

Oskar Gärdeman is a senior adviser at Enova, the state-owned company whose task is to contribute to the transformation of energy use and energy production. He points out that Enova has an ongoing competition with a frame of NOK two billion aimed at new technology and solutions for floating solutions.
- Fundamentally, this is about contributing to Norway getting out of the starting blocks quickly, reducing the costs of floating offshore wind, which may at the same time give us a head start on other countries. So, there is a lot happening here now with many smart inventors with new solutions, but what we are primarily looking for are robust solutions that can reduce costs, says Gärdeman.

- Such as Stationmar's concept with the combination of wind and hydropower?

- There is always a danger that projects that include several technologies may also result in too high a technological risk. It is a harsh environment out there at sea. But I won't rule anything out.
- What we see is that the costs of floating offshore wind must come down towards a total cost over the plant's lifetime of NOK 0.50 - 0.60 per kilowatt hour. We are far from that today, he says.

DNV has previously estimated a cost at Utsira Nord of around NOK 1.50 per kilowatt hour, and that, depending on the price of electricity, there is probably a need for at least three times higher subsidies than the NOK 23 billion the government has set as a framework for the Sørlige Nordsjø II project .

- If we are to get down to NOK 0.50 - 0.60, we must be able to cut costs in all areas - everything from turbines, columns, foundations, mooring and cabling, marine operations and maintenance. Through the support programmes, our job is to help ensure that floating offshore wind farms can be developed on commercial terms, without the need for government subsidies, says Gärdeman in Enova.