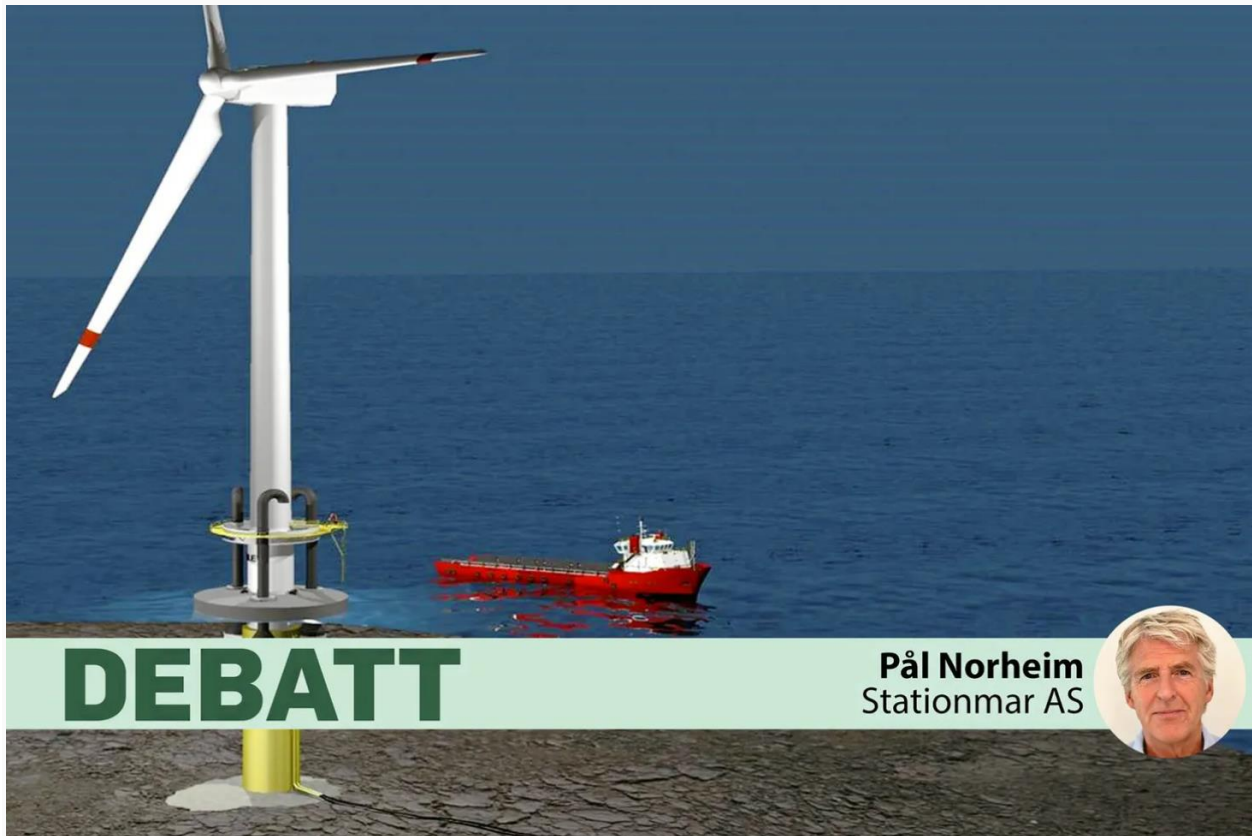


Europower 22.10.2024 (English translation):

NVE's report on offshore wind opens up new industrial opportunities

On the Norwegian shelf we have the natural conditions with the combination of a lot of wind and high waves. It is precisely this that we must utilize to our advantage, and talk about Offshore Energy and not Offshore Wind.



We have natural prerequisites for success in Norway. We just have to think a little "outside the box", writes CEO Paal Norheim in Stationmar. Photo: Stationmar

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By Paal Norheim, CEO of Stationmar AS

This article represents the opinion of the author.

Many are of the opinion that NVE's report concludes that we must simply forget our hopes for a new large-scale Norwegian offshore wind industry, and that it puts into words what many skeptics of offshore wind have long thought. But in the opinion of the undersigned, the report

rather tells us how we can succeed with Norwegian offshore wind, or rather offshore energy, and perhaps take a foot in the ground when it comes to pushing forward the tendering of floating offshore wind farms, until we are absolutely sure that we have technology that will work in our harsh environment waters. And rather focuses on developing and making bottom-fixed "offshore energy parks" in the Norwegian part of the North Sea basin competitive.

After several have carefully studied NVE's report "*Development in the power market towards 2050*", there has been no shortage of conclusions that the Norwegian offshore wind industry has no future, where among other things the following headlines have been used:

- *NVE report: Full stop of offshore wind in 2040 – only a fraction of the government's target will be achieved*
- *NVE: Offshore wind in Norway will not be profitable after 2040*
- *Crushing offshore wind verdict: NVE has no faith in the government's offshore wind adventure*
- *The NVE boss tears Asland's dream to pieces*

First of all, I would like to say that it is striking how NVE's report substantiates many of my statements in my article in Europower 10.09.24 regarding "*Norway must harvest the low-hanging fruit first*".

We have natural prerequisites for success in Norway. We just have to think a little "outside the box".

Two of the conclusions from NVE's report are:

- Based on the natural conditions, Norway is uniquely poorly positioned for offshore wind, and we are being outcompeted by our neighboring countries. More favorable conditions in the rest of the Nordic region and Europe means that the projects (read: bottom-fixed) in these countries can become more competitive than the Norwegian ones.

- Based on what we know today about the costs of offshore wind and the development in the countries around us, it may be challenging to create a profitable operation for Norwegian offshore wind between 2040 and 2050, unless we see a dramatic technological development or a drop in costs in this area.

Has a lot of wind and high waves

So what are the "natural prerequisites" we have in most areas where there is currently talk of offshore wind development in Norway, and can we ensure that the requested "dramatic technological development" takes place?

It is true that the fact that our current offshore wind areas are often far from land, and that several of these are in deep waters, creates challenges in relation to competing areas in Sweden, Denmark and Finland (and for that matter also several areas in England and Scotland).

But what we have on the Norwegian shelf, and a lot of, are the natural conditions with the combination of a lot of wind and high waves. It is precisely this that we must utilize to our advantage, and talk about offshore energy and not offshore wind. We must make better use of the diversity the ocean gives us.

Energy production per turbine can be doubled

As I mentioned in the aforementioned article dated 10.09.2024, we are in Stationmar developing a technology that also utilizes the wave forces to generate electricity, so that the total energy production from each bottom-fixed offshore wind turbine can in most cases be doubled, and also ensure more predictable and stable delivery of power to the grid. This is done by using the wave forces to lift seawater up to a water reservoir that encloses the wind turbine column itself, and then lead the water with a 20 meter drop height, in pipes down to another turbine inside the wind turbine column itself, similar to those used for typical well-proven land based hydropower plants. In other words, wind power, wave power and hydropower are utilized in one and the same construction.

This could well be called "dramatic technological development", but which is nonetheless based to a large extent on known technology from hydropower plants, and our experience with operating these across the country.

There are also other Norwegian companies that are working to make bottom-fixed offshore wind energy parks more efficient.

So what about the government's target of 30 GW of offshore wind by 2040?

In NVE's report, it is concluded that what we can achieve by 2040 is a production capacity of 6.2 GW, i.e. only one fifth of the target.

Here I refer to my previous debate post, where I stated, among other things: *If we are to be in any way close to meeting Norway's ambitions of 30 GW of offshore wind by 2040, we must immediately continue what we have already started, namely a large-scale development of bottom-fixed offshore wind farms in the North Sea basin, where today there are already proven and safe development methods. In other words: harvest the low-hanging fruit first, and try to get Norwegian companies on board, so that we can learn to crawl before we go.*

It has already been determined that the potential in the Norwegian part of the North Sea basin can be around 10 GW, which we at Stationmar believe can be roughly doubled by also equipping the fixed wind turbine columns with our wave energy generation system. Alternatively, we can choose to build out around 10 GW of bottom-fixed offshore energy capacity with half of the turbine structures and area needed with conventional offshore wind development. In addition, we believe that one can utilize the areas/distances between the turbines, which are currently required to handle the shadow effects (wake effects) on wind from nearby turbines, and install stand-alone wave energy generation systems, without rotor blades and generator on top of the column.

There are also other companies that develop wave energy systems.

Plenty of EU funding available

EU has developed a strategy to utilize wave energy as part of its wider plan to promote renewable energy and reduce dependence on fossil fuels. Through the various funding programmes, such as Horizon Europe, the EU has invested in several pilot and demonstration projects for wave energy in various countries, especially in regions with a lot of coastline and good conditions for wave energy, such as Ireland, Portugal and Spain. EU continues to work on developing a policy that will make wave energy competitive with other energy sources. This includes support schemes, investments in infrastructure, and the development of regulations that ensure that the marine areas can be used in a sustainable way.

As an example of support for hybrid projects, the ongoing Seaworthy project can be mentioned, where in December 2023 it was awarded 26 million euros from the "European Commission's Innovation Fund", to test out a project integrating floating offshore wind, wave energy and hydrogen production.

There are plenty of opportunities here, if only one can get started with developing similar Norwegian ocean energy projects.

So what about competitive floating offshore wind technology for Norwegian waters?

In NVE's report one can read the following: *The conditions outside Sweden, Finland and Denmark are mostly suitable for bottom-fixed offshore wind. In Norway, many of the designated areas require floating foundations, a technology that is less developed and more expensive than fixed foundations.*

As mentioned again in my last article, we at Stationmar believe that one must not underestimate the load environment that arises when you have to handle the forces from typically three rotor blades of lengths of at least 150 meters each, which act on the turbine tower typically 175 meters above sea level, and combine these aerodynamic forces with the hydrodynamic forces arising from the sea. For floating turbines, we have therefore in recent years been developing a technology we call HMN - Heave Motion Neutralization, where we neutralize the movements of the floating turbine foundation. We believe this technology is the right way to go for floating turbines, at least in our harsh environment waters. By neutralizing the movements and counteracting the environmental forces, so that floating turbines can lie approximately as still as bottom-fixed turbines, it is avoided that turbine components are exposed to unnecessary acceleration forces, with which we already have negative experiences today, even for "mini-putt turbines" with a short operating time.

And, last but not least, when we have managed to eliminate the movements of floating turbines, we can also equip the foundation columns for these with our wave energy generation system, and also have our own wave energy structures, without rotor blades, in the wind

shadow areas. Such "dramatic technological development" cannot of course happen overnight, but if we get started with bottom-fixed offshore energy parks sooner, we will have time to do our homework properly before we move on.

Lack of investment in pioneering offshore wind technology

The government's failure to invest in the development of ground-breaking offshore wind technology, and recently submitted proposals for the state budget, make it difficult for "dramatic technology development" in offshore energy.

A small sigh of relief at the end: When the government comes forward and allocates state funding for "groundbreaking technology", and creates seed funds, and even what they call pre-seed funds, this capital usually does not reach smaller technology developers and start-up companies such as Stationmar. This is because such funds are mostly aimed at investments and growth related to technology that is already well developed, and not at innovation projects. This is justified by the rules surrounding state aid, which state that "the state aid regulations must regulate and prevent competition-distorting state aid". Furthermore, the conditions for receiving support are that one must be able to provide 50 per cent self-financing, which is difficult for small technology development companies such as Stationmar. And further that one should preferably have carried out some form of scaled-down pilot testing of the technology.

Here, the authorities need to think again, also with regard to the proposal for the state budget that were recently presented. Investinor, which together with Nysnø is (or at least should have been) the state's tool for securing capital for start-up companies, is provided with a total of NOK 8.4 million in the state budget for 2025, compared to NOK 158 million the previous year. In relation to this, the following comment was made by Investinor's director of communications:

"It is surprising that the grants for the early phase are being cut at a time of great uncertainty in this market. We have pointed out on several occasions that there is a lack of several billion kroner in risk capital in Norway. This proposal will affect entrepreneurs, start-up companies and others across the country - and there will be fewer companies to build tomorrow's business life".

As for Nysnø, these will not receive new funds in 2025.

Norway now has to change its support policy, especially with regard to smaller innovative companies within the offshore energy industry. We have no time to lose.