

RECHARGE

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'Next year will really move the needle for the sector': Equinor floating wind chief Indrebø

Equinor vice president for floating offshore wind Sonja Chirico Indrebø
Photo: Equinor



Four years after bringing the world's first full-scale floating wind array into being, the Norwegian energy giant has launched a new platform design with giga-scale international projects in its cross-hairs, writes Darius Snieckus

By **Darius Snieckus**

Since 2009, when international offshore oil giant Statoil – now Equinor – switched on **Hywind Demo**, the world's maiden industrial-scale floating wind turbine, in the North Sea, the company's name has become nearly synonymous with the cigar-shaped spar platform it pioneered and went on to refine for two other flagships, the 30MW Hywind Scotland, the first-ever commercial array, and **Hywind Tampen, a 88MW lead-off project** devised to slash emissions from the Snorre-Gullfaks oil & gas field off Norway.

That all changed earlier this month. The Stavanger-headquartered company chose the COP26 climate conference in Glasgow, Scotland **to unveil a new concept, a shallow-draft semisubmersible dubbed the Wind Semi**, a stripped-down "flat plate" triangular design that it is betting on to take floating wind into the realm of gigawatt-size projects in Europe's northern seas as well as off Asia and in the US Pacific.

"We are ready to develop the next generation, large-scale commercial floating wind... gigawatt-size projects [developed] in one single phase," said Sonja Chirico Indrebø, Equinor's vice president of floating offshore wind, launching the design.

The Wind Semi is the embodiment of engineering for industrialisation: increased "dependability" through the use of a passive ballast system and streamlined substructure "free from bracings, heave plates and complicated nodes" so as to lower the risk of system failure and minimise maintenance, and "flexibility" towards the supply chain via a design that could be fabricated in many facilities around the world and shipped flat-packed to an offshore project's nearest port for assembly and tow-out.

"This design is like a flat-pack – very simplified compared to many of the semisub designs out there," said Indrebø, speaking with Recharge after the unveiling.

"Removing as much steel and complexity as you can from a production point of view but also from an operational [one]. [The Wind Semi] has been very much about going back to basics and simplify, simplify, simplify... drawing on the 50 years of floater experience [from offshore oil and wind] at Equinor.

"The point... is that you can fabricate [Wind Semis] where it is optimal to do so, and then you can assemble them closer to where you need the actual installation itself," said Indrebø, noting that "moving these structures [a floating foundation with turbine] is very complicated but transporting a flat-pack – like many other industries do – makes it much more efficient."

The launch of the Wind Semi semisub design represents less a departure for the once spar-fixated company and more a "next step" in an evolution at Equinor sketched out on its 'road map' when the multi-unit Hywind Scotland came online in 2017 that forecast it would become increasingly technology agnostic as it spearheaded the industrialisation of a sector angling for a levelled cost of energy of €40-60/MWh (\$45-68/MWh) by 2030.

"The big change as we move to larger scale units and projects is, of course, serial production. Hywind Scotland is a fantastic asset but it is only five turbines. If you are building 60 or more [units] for a gigawatt-scale farm then the main step is to get more of efficiency through serial production," said Indrebø.

"With our eleven for the Hywind Tampen we do see how this can be done. There we are casting in concrete so... now we have experience in both steel [as the Hywind Demo and Scotland units were fabricated in] and concrete and it gives us the toolbox to truly adopt the right solution for a given site and the local supply chain nearest the site."

Though unveiled in Scotland with an eye on the giga-scale developments that are set to come out of the 10GW **ScotWind leasing round** now underway, the Wind Semi is also seen as being well-suited to other international markets, not least Equinor's **Firefly project off South Korea**. "[Beyond Scotland] we are envisioning the design will be a good solution [in South Korea] as well, and indeed for our California [US] and French projects," said Indrebø. "The spar solution has worked really well in the North Sea and will continue to be an optimal solution for the region, so we are not disregarding the spar – the **Utsira Nord project** [soon to be auctioned off for development off Norway], for instance.

The Wind Semi design is informed not only by Equinor's faith that the time is ripe to drive ahead floating wind industry internationally at utility-scale, but also the spirit of experimentation it believes will carry the sector forward in the coming decade as deepwater arrays take up a decisive role in the wider global offshore wind build-out.

"After Hywind Scotland [was brought online in 2017], there really weren't that many floating wind projects around in the world, so it became a case of rather than going after one [floating] turbine here and one there, we created this project at Hywind Tampen where we are both the customer and developer to prove that floating wind could be used not just for generation to the grid," says Indrebø. "You can use [floating wind] for reducing oil and gas emissions; you can use it for islands, to balance their grids; for hydrogen one day too as an option."

"It is about showing by doing, not just telling, finding those new solutions that could be envisioned [and realised]. As we get floating wind down the cost curve, many new opportunities open up. We are looking at all kinds of innovations."

Indrebø points to Hywind Scotland – originally called Buchan Deep – which was pointedly "renamed the Hywind Scotland pilot park" in line with the fact that it was "always meant to be a place of experimentation", and has lived up this moniker via such pioneering projects as Equinor's so-called **Batwind floating wind-to-battery scheme**, or, more recently being home to the **first employment of 'sea drones'** to survey how marine fauna are being impacted by deepwater wind arrays.

"The four years [of operation at Hywind Scotland] has proven that floating wind is reliable... in the harshest of conditions, that it can produce very efficiently [**recording a record-setting renewable energy capacity factor of 65%**], that it is not a technology that is a 'blip' that you operate for a little while and then decommission.

"But we have also the opportunity [at Hywind Scotland] to really investigate every little aspect of how a floating wind farm will co-exist with marine life [using the Sailbuoy sea drones] – it has been a laboratory on which we can do 'deep dives' into many things as well as a clean electricity-producing project," Indrebø adds.

CGI of Equinor's Wind Semi concept Photo: Equinor



Certainly the financial backing is there at Equinor to capitalise fully on the learnings from floating wind projects brought into operation so far – and to transfer experience gleaned to those yet to put steel in the water – with the company having earmarked almost \$16bn in spending over the next five years on offshore wind, with deepwater projects expected to become "an ever-bigger part" of its energy transition strategy, says Indrebø. Still, much as she says Equinor is "hugely excited" by the prospects of a giga-scale international floating wind sector, Indrebø divulges her frustration more hasn't been achieved so far – not least given the runaway success of bottom-fixed offshore wind's expansion in recent years.

"The potential for floating wind to really lift off can be exemplified by what happened in bottom-fixed [offshore wind]: you've seen as the market reached a certain size, then the supply chain really got involved – look at how [the UK's vast] Dogger Bank [bottom-fixed wind project], at 3.6GW, is creating opportunities for companies that used to be focused on offshore oil and are now able to invest to focus on offshore wind," she says.

"Within floating wind we are so dependent on the market. We're ready. We would invest, invest, invested [in the sector] if there are projects to invest in. It is not a case of our waiting, or the technology not being fully tested and proven. We have the capital. We are not dependent on getting finance from [outside the company] to build these first really big projects."

Next year "will really move the needle for floating wind because there are so many countries that have ambitions and first projects", Indrebø reckons: "We hope this is about to happen off Scotland, Norway, **France**, the US Pacific, South Korea and many other markets that are going to soon be coming through with first developments.

"I used to always call myself an 'oil baby' because I was born in Stavanger [Norway's offshore oil 'capital'] days after the first discoveries off Norway," she says. "With the way floating wind is growing, I find I am not saying that much anymore."