North Sea Energy
offshore system integration

Why offshore hydrogen needs a North Sea-wide perspective

AquaVentus

IN CONVERSATION WITH ROBERT SEEHAWER, MANAGING DIRECTOR OF AQUAVENTUS

Figure 1. Locations of energy hubs at and round the North Sea. Source: North Sea Energy. The role of offshore hubs

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Who is Robert Seehawer?

MANAGING DIRECTOR AQUAVENTUS

Robert Seehawer has been **Managing Director of AquaVentus**, the German offshore hydrogen initiative, for four years. He began his career in banking, working in fixed income, and over the past two decades has built up broad experience across the energy sector. At the European Energy Exchange, he traded power and **CO_2 certificates and later worked in gas trading.**

His perspective on the energy transition is influenced by **his combined background in macroeconomics,** markets, and electrons and molecules. On a personal level, the birth of his youngest daughter and the urgency of climate change were the catalysts that pushed him to leave the abstract financial markets for a more tangible endeavor: **the construction of an offshore hydrogen system at scale in the North Sea through AquaVentus.**

Telling the story from the end

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10 GW and a pipeline backbone

Figure 2. AquaDuctus Pipeline. Source: Aquaventus

For Robert, the AquaVentus vision only makes sense when it is **"told from the end."** At first glance, onshore electrolysis may seem more cost-effective in isolation, but once you factor in cables, grid congestion and space on land, offshore electrolysis, combined with a hydrogen pipeline, is the most cost-effective option on a large scale. His frequently cited statistic captures this in one line: **a hydrogen pipeline is approximately half the cost of a single electricity cable, yet it can transport up to ten times as much energy.**

The AquaDuctus pipeline, designed for up to 20 GW, can connect offshore production from Germany, the Netherlands, the United Kingdom, and Denmark to shore at Bunde. **This kind of cross-border, integrated backbone is what makes large-scale offshore hydrogen economically viable.**

Aquaventus & NSE

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What aquaventus took away from the NSE

Robert acknowledges that the NSE has influenced how he and AquaVentus look at the offshore energy system. Three elements stand out for him. First, NSE takes a truly **comprehensive view**: offshore wind, natural gas, CO_2 and hydrogen were already brought to the same table in NSE5, the fifth phase of the NSE program, whereas in Germany these topics were often treated separately or even avoided. CO_2 in particular was long something “Germans, including myself, prefer not to talk about, as if it would resolve itself”.

Second, **NSE contributed to challenging the "single silver bullet" attitude that dominated much of the German debate**, where the energy transition is described almost entirely in terms of electrons, even though around 25% of German heating still runs on oil. This reinforces **Robert’s argument that the energy transition requires not only electrons, but also molecules, storage, and sector coupling.** Third, NSE offers a **form of reassurance and validation that AquaVentus is on the right track, towards fulfilling its 10 GW ambition**, considering that Dutch, Danish, UK, and Norwegian partners reach similar conclusions from different starting points.

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What aquaventus brought into NSE

From Robert's perspective, AquaVentus' **clearest contribution lies in the economic and market dimension.** Drawing on his background at the European Energy Exchange, he sees great value in understanding how the power market works in practice: **captured prices, price signals, and the value of shifting cheap or even negative-price electricity hours into hydrogen.** Together with a consortium of offshore wind developers, AquaVentus carried out a major study in 2024 **with consultancy E-Bridge** ("E for electricity", as Robert puts it).

The central finding was that offshore wind is facing increasing economic pressure: **as wind farms move further offshore, costs rise, while captured prices fall because neighbouring turbines often produce at the same time.** Sector coupling with hydrogen is presented as one of the key ways to ease that pressure. E-Bridge was subsequently hired to perform a similar analysis on the Dutch side, suggesting that the argument has already travelled across the border. **The study has also helped shift the technology discussion from flat-running alkaline electrolysers towards more price-responsive PEM systems.**

And in Germany itself:

Policy is starting to move

Robert points to the German regulatory context as a key constraint. **Current regulation still largely follows an "either/or" principle: an offshore project must either produce electricity and transport it to shore, or produce hydrogen.** In practice, this means that sector coupling is not yet properly enabled. At the same time, he sees "very promising signs" that this will change, with three concrete tracks under discussion: **the Offshore Wind Energy Act, offshore spatial planning rules, and regulations on how energy is transported to shore.**
He also notes t**hat the tone of conversations with policymakers has shifted markedly.**

Three years ago, the answer on sector coupling was blunt: "no, we build cables, go away." Today, sector coupling and CO_2, both long taboo topics in Germany, are increasingly on the agenda. He **credits this partly** to the fact that the same integrated message is now carried by **multiple NSE voices from different jurisdictions**, which lands more convincingly than AquaVentus speaking alone. **Step by step, the integrated thinking he encountered in NSE is finding its way into German regulation.**

A hopeful outlook

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Despite a more turbulent geopolitical context than when he joined AquaVentus four years ago, Robert remains optimistic. On the Dutch side, pilots such as PosHYdon are coming online, while Germany is expected to follow this summer. He appreciates the progress made by **TenneT NL and Gasunie** and sees it as a valuable reference for Germany's more fragmented landscape of four TSOs, where alignment is gradually improving. Across Dutch, Danish, Scottish and German partners, the message is converging on the same conclusion: integrated North Sea infrastructure planning is a **no-regret option.** As Robert puts it: **"The wind doesn't stop at the border."** For him, the fundamental trend remains unchanged: **partnerships are strengthening, and the development of large-scale offshore hydrogen in the North Sea is transitioning from a purely national aspiration to a shared regional project, built step by step through demonstrations and regulation.** That gives him every reason to keep going.

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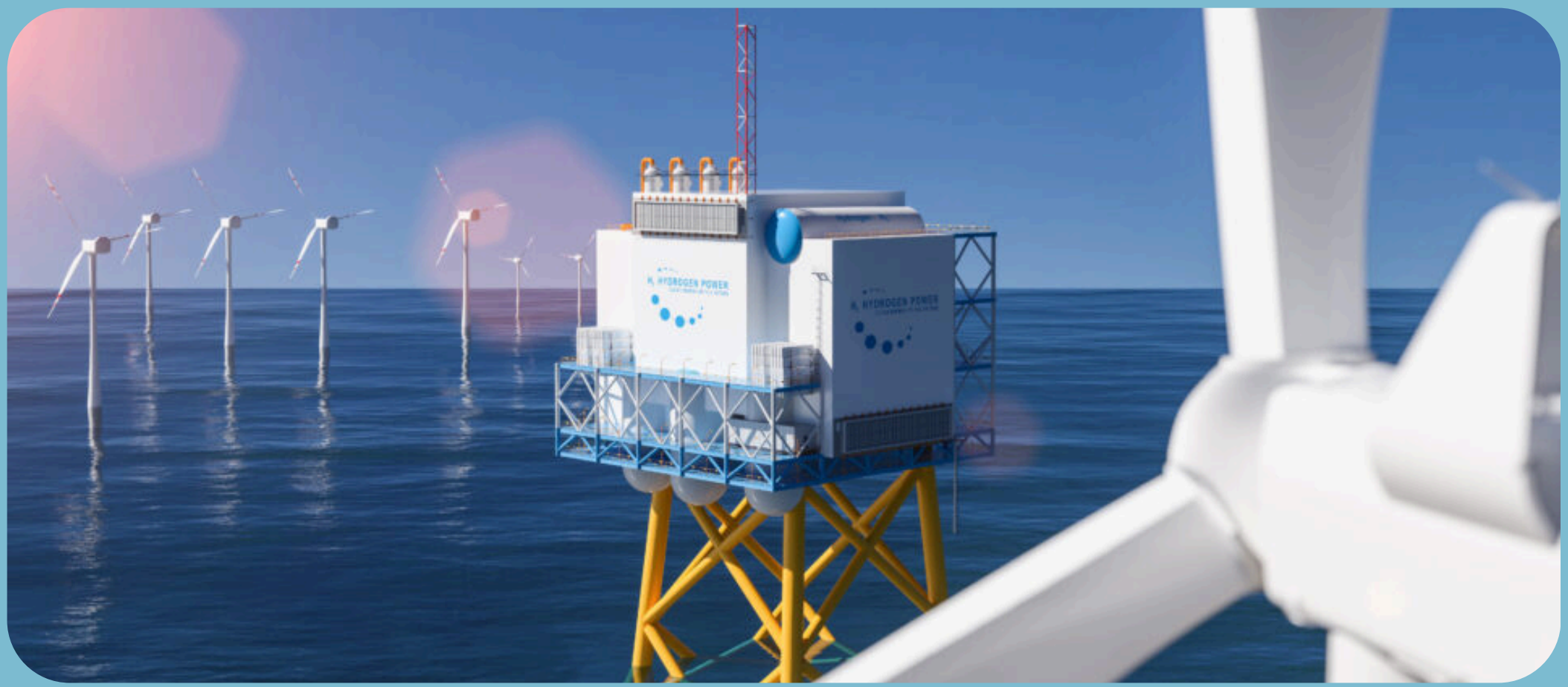

The wind doesn’t stop at the border. The energy transition is not a sprint, it’s an uphill marathon- and offshore hydrogen is one of the ways to keep moving.

-ROBERT SEEHAWER