Putting the North Sea puzzle together

In conversation with René Peters, programme management North Sea Energy

In September, NSE6 and the German research programme SOffie met on Helgoland for a joint workshop on offshore system integration, in cooperation with AquaVentus. Two weeks later, we sat down with René Peters to look back. We talked about ten years of North Sea Energy, the ambitions of a small island in the middle of the North Sea, and why he believes the next step lies in countries building on each other's pilots rather than repeating them.

Who is René Peters?



Photo: René Peters

René Peters works at TNO and has been part of North Sea Energy since it started, around ten years ago. Together with Joris Koornneef and Madeleine Halters he forms the programme management team. Madeleine is the official project leader and Joris, as science manager, focuses on the research. René covers the business and market side: programme development, partnerships, communication and attracting new partners. Keeping the existing network active and engaged is just as much part of his job.

His motivation starts from a basic premise. An energy system that no longer emits CO_2 only works if it is properly integrated. Electricity, gas and hydrogen systems need to be connected, so the system can be balanced and energy can be stored. That also creates room to reuse what is already in the North Sea. Existing pipelines and depleted gas fields can be used for CO_2 storage, hydrogen transport or hydrogen production from offshore wind. In René's words, it all comes down to "integration and collaboration", with one goal: an energy system that is stable, affordable, sustainable and resilient.

From brainstorm to platform

René describes North Sea Energy as a "breeding ground or testing ground for new concepts and new ideas for offshore system integration." When the programme started, much of the work consisted of exploring what could be done with existing assets and new energy production at sea. Energy storage, hydrogen production, CO_2 storage in depleted gas fields and platform electrification were all on the list. Many of those ideas have since found their way into real pilots and projects.

> *"That it is actually built and genuinely realised; that is what drives me."*
>
> René Peters

According to René, collaboration works so well within NSE because the programme operates in a pre-competitive phase. Companies that may later compete with each other can still build knowledge

together and look at cases from different angles, such as technology, ecology, business cases and regulation. Sharing that knowledge speeds things up for everyone.

The programme has also grown in ways nobody quite planned. The original idea was to study a set of concepts for a few years and then move on to implementation. Instead, new topics kept emerging. Today NSE also covers safety, resilience and the protection of offshore infrastructure. “It is a kind of snowball effect.”

Why Helgoland?

NSE increasingly looks beyond the Dutch part of the North Sea. The programme now works with partners in Germany, Denmark, Norway, the United Kingdom and Belgium, with the ambition to grow into a truly international North Sea programme. That is why it organises exchanges in different countries.

Helgoland was a logical choice. The island lies in the middle of the North Sea, has ambitions in hydrogen production from offshore wind, and has been selected for an early German offshore hydrogen pilot, comparable to the Dutch PosHYdon pilot. The cooperation with the AquaVentus consortium made the location even more relevant.



Photo: René on Helgoland

What stayed with René most was how concrete the plans already are, with design drawings for the pilot on the table, and the passion behind the German ambition to combine wind energy and hydrogen. He was also surprised by the scale of the island’s ambition. Helgoland has around 1,300 inhabitants, yet it wants to play an important role in Germany’s future energy system. He calls that “quite impressive”. Whether every plan will be realised remains to be seen, but the contrast stood out.

Same challenge, different starting point

During the exchange, René mainly saw similarities. The Netherlands and Germany both have major ambitions for offshore wind, and both face the same problem: new wind farms are being built further and further from the coast, which makes connecting them with electricity cables more expensive. Converting electricity into hydrogen offshore and bringing it to shore by pipeline can then become the more attractive option. The ambitions and timelines for offshore hydrogen in both countries are also comparable.

The main difference lies in the starting point. The Netherlands has existing oil and gas infrastructure, including pipelines and depleted gas fields. Germany has far less of that, but does have large wind energy potential. For René, it is precisely because the ambitions are so closely aligned that there is so much room for joint development. The shared conclusion on Helgoland was clear: the Netherlands and Germany should work more closely together on offshore wind and hydrogen.

Hop, step and jump

International collaboration, René says, starts with getting to know each other: understanding what the other party is doing, where its focus lies and what it wants to achieve. But there is little value in countries all doing the same thing. It becomes interesting when projects build on one another.

He compares it to a “hop, step and jump”. One party carries out a first pilot, another follows with a larger pilot or a different technology, and then a further step becomes possible. That is how the scale-up of offshore hydrogen can be accelerated. When countries share the lessons from their projects, mistakes made in one do not have to be repeated in the next, and new technology can reach the market faster. The point, in his words, is to see how countries can “really complement each other and genuinely accelerate things by working together more closely.”

The same logic applies beyond Germany. Norway has decades of experience with CO_2 storage, while the Netherlands is only now starting at scale with projects such as Porthos. Norway also has long experience with electrifying offshore platforms via cables from shore, whereas the Netherlands is further ahead in using electricity from offshore wind farms for that purpose. The United Kingdom shares many Dutch ambitions, from offshore wind and CO_2 storage to hydrogen and interconnectors, but organises them in a more market-driven way, while the Netherlands relies more on public-private collaboration. Seeing how comparable projects get off the ground in different systems is valuable in itself.

Everyone has a piece of the puzzle

Within NSE, TNO’s role is to keep an overview of the whole energy system. Individual partners usually hold one specific part of it: a wind farm, a CO_2 storage project or a hydrogen pilot.

> *“Everyone has a piece of the puzzle, and we are trying to put together a beautiful puzzle.”*
>
> René Peters

Ecology is one of those pieces. The North Sea cannot be built up without limits, so the system has to be developed within several conditions at once, including a sound business model, ecological boundaries and the government’s climate targets. René does not see this mainly as a gap between research and practice. The real task is connecting all the components. An offshore hydrogen plant, for example, has little value without a pipeline to bring the hydrogen to shore. “That is the puzzle we really have to put together.”

The exciting step offshore

When research shows that a concept is technically and economically promising, René believes a group of partners should try to turn it into a pilot or demonstration. Sometimes that takes a particular mindset: “This is the first time in the world, but we are just going to do it.” A working pilot gives others confidence that a concept does not only work on paper.

That step is still difficult. First-of-a-kind projects come with uncertainties about cost, planning, technology and risk, which makes them unattractive to investors. Government support is needed to reduce those risks, and that support is not only financial. Changes to laws and regulations can be just as important. Ten years on, the barrier has not disappeared. “As long as it is a report, it is safe. But when it actually has to go onto the platform offshore, then it becomes exciting.”

Still, there are clear examples of the step succeeding. The ONE-Dyas platform is supplied with energy in a new way and is connected across the border to a German wind farm. PosHYdon faced many

obstacles before it could be realised, and Porthos is now being built. Together, they show that ideas that once existed mainly in reports can become reality.

Looking ahead

In the short term, René would most like to see stronger cooperation between the Netherlands and Germany on hydrogen production from offshore wind. The exchange with Germany is a first step. Norway, the United Kingdom and other North Sea countries could follow, and he hopes countries will eventually be willing to fund a joint programme, for example through the Clean Energy Transition Partnership.

Joint publications can help, too. That can be a technical article in a trade or scientific journal, but also a piece aimed at policymakers to encourage closer cooperation. In the end, companies, governments and knowledge institutions all need to work together. René also makes a case for giving innovation, knowledge development and knowledge exchange a bigger place within the North Seas Energy Cooperation (NSEC), where they are still a limited part of the agenda and where North Sea Energy's knowledge programme could connect well.

> *"We actually want to go all around the North Sea and really intensify that collaboration with all the countries."*
>
> René Peters