

How will we heat our homes in the future when the wind is not blowing and the sun is not shining? In other words: how can we store solar and wind energy in an affordable, sustainable and large-scale manner?

Aqua Battery, REDstack and Pure Water Group are formulating an answer to this in the form of an innovative energy storage technology. Pieter Hack, founder of REDstack and Managing Director of Pure Water Group, hopes to have large-scale production operational within a few years.

The three parties each contribute their own expertise. Pure Water Group (PWG), based in Sprundel, in the south of the Netherlands, develops and builds industrial water treatment installations. Managing Director Pieter Hack: "We turn regular tap water into ultra pure water for the energy and pharmaceutical industries, among others, using EDI modules based on electrochemical purification technology. The module needs a plant to work; we design and manufacture the control unit with pipes and pumps in-house."

PWG and REDstack

This is exactly the point where PWG and REDstack found each other. REDstack, based in Sneek, gained fame with the development of Blue Energy Technology. The company developed modules to extract energy by combining fresh and saltwater streams. If you drive along the Afsluitdijk in the Netherlands, you can see the pilot plant from the shores of the IJsselmeer. After some experimentation, the module also proved suitable for desalinating brackish water streams. REDstack develops the modules, not the processing unit. Founder Pieter Hack: "REDstack creates the process design and produces the stacks, and PWG builds the necessary process plant for that."

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Pieter Hack

DUTCH COMPANIES JOIN FORCES IN DEVELOPMENT OF BREAKTHROUGH TECHNOLOGY

Large-scale energy production and storage

Role of a battery

REDstack was created as a spin-off of water technology institute Wetsus. The young company Aqua Battery, located in Leiderdorp, has the same origins. Many employees, former employees and trainees know each other and have worked together, and there is a lot of interaction. Hack: "Aqua Battery's product is based on similar technology. We use the RED module to generate a current by combining saltwater and freshwater. If we reverse the module, a current is released. The reversible module takes on the role of a battery that can charge and discharge."

Scaling up

There is now a factory in Sneek that manufactures modules for all three companies on a small scale. Hack: "All three of us use the technology, so it makes no sense to build three plants." Within a few years, Hack hopes to build a plant for large-scale energy generation and systems suitable for providing energy storage for large-scale units such as residential areas and islands. Hack: "Preferably in the Netherlands. Especially in the early stages, it's nice to be able to hop in the car to check out the progress."

Blue Energy Power Station

One interesting option is combining RED Blue Energy technology with dams

and sea locks. Hack: "A Blue Energy Power Station generates the electricity and can pump out river water during high tide. This would turn a sea wall into a net energy producer."

Hack: "It could be at the Afsluitdijk, at IJmuiden, where the North Sea Canal meets the sea, or at Rotterdam, where the Meuse and Waal reach the sea." There are many international possibilities as well; New York, for example, is one of the dream locations: "Suppose New York decides to build a large dam around the city to protect it from rising waters. That would be the perfect place for a Blue Energy Power Station."

The energy storage systems are an excellent addition to systems that do not generate sustainable energy continuously, such as wind farms and solar parks. Together with Aqua Battery's energy storage system, renewable energy could be continuously available.