

Opening of the 'First Dutch' 50 KW water electrolyser system

Program Friday 13^e September 2019

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| 8:30 | Transfer from Alkmaar train station, Wognumsebuurt 18 | |
| 9:00 | Welcome at Research Centre ECN part of TNO in Petten | Lennart van der Burg
Business manager Hydrogen |
| 9:15 | Presentation of the 'first Dutch' consortium
High performance and cost effective PEM electrolyser stack technology by Hydron Energy | Sander Ten Hoopen
Director Hydron Energy |
| | Integrating the electrolyser stack on site in a fully and safely operating green hydrogen facility. | Jordi Zonneveld
Manager Hydrogen Frames |
| | Developing the next generation electrolyser with extended life time and flexible in operation | Frans van Berkel
Senior scientist ECN.TNO |
| 11:00 | Official start-up of operation of the 50 KW electrolyser
The role of TNO in accelerating innovation to make green hydrogen available below 2 Euro/kg | Mark Overwijk
Research Manager ECN.TNO |
| | About the potential of Hydrogen in the energy system and the opportunities for the Dutch high tech industry | Jörg Gigler
Director TKI New Gas |
| 11:30 | Visit TNO research lab | |
| 12:30 | Depart to Alkmaar or to Schiphol airport | |

Register to attend the kick-off:

The NextGenP2H2 kick-off is part of the B2B matchmaking event 'Fueling the future with renewable gases', held 12-13 September in Alkmaar. More information can be found on the conference [website](#). Would you like to attend, please register through this [link](#) (maximum 50 people) or by personal invitation only



The "blue container" with the Dutch technology inside is placed at the location at ECN.TNO in Petten (NL)

NextGenP2H2: paving the way for a full scale Dutch PEM electrolyzer

Friday 13 September the 50 kW PEM electrolyzer test system will be revealed and started up at the Faraday Lab in Petten. Within NextGenP2H2 project, the PEM technology will be optimized in view of low cost and high performance, thus paving the way for further development of a full scale Dutch MW PEM electrolyzer.

As a result of prior research and development at VoltaChem/TNO, the 50 kW prototype PEM electrolyzer system has been installed at the brand new Faraday Lab for research into electrochemistry. In NextGenP2H2 project, this system will be thoroughly tested and optimised. A major goal is enhancing the performance of key components such as membranes, electrodes and seals, thus prolonging the lifetime of the electrolyzer stack. Furthermore, the focus will be on further reducing the cost of PEM technology: a factor 2-5 is necessary to offer a competitive alternative to fossil based H₂ production.

The optimised NextGenP2H2 50kW system will thus combine low cost with high performance and manufacturability. The knowledge obtained will be used for the conceptual design of a full scale 1 MW PEM electrolyzer. The project will also help to decide in which value chain this electrolyzer can be deployed, following the analysis of business cases for various Power-2-X applications.

Knowledge and infrastructure

The VoltaChem/TNO Faraday Lab in Petten builds on extensive knowledge and experience obtained in earlier long-running PEM fuel cell programme that included work on reversible PEM fuel cell and electrolysis systems. At the VoltaChem/TNO Faraday Lab testing facilities, third party electrolyser stacks and small scale components can be tested and characterised aiming for cost efficiency and robustness. This will strengthen the competitiveness of Dutch industry in the field of electrolyzers, that is currently dominated by international manufacturers. Given the huge predicted growth in green hydrogen demand, great opportunities will arise in the electrolyzers market.

Consortium

To develop the 'future ready' next generation of Dutch PEM electrolyzers, TNO/VoltaChem joins forces with Hydron Energy (Noordwijkerhout) and Frames Energy Systems (Alphen aan den Rijn) in the 'first Dutch' consortium.

Hydron Energy is an innovative Dutch clean-tech company that develops, manufactures and markets high performance & cost effective PEM electrolyser stacks. In the NEXTGENP2H2 project, Hydron Energy has optimised its 50 kWe stack platform on performance and cost. Furthermore a conceptual design of a 1MW electrolyzer stack has been drafted.

Frames Energy Systems designs and constructs process installations for the global onshore and offshore oil- and gas industry. Frames will contribute to the extension of the industrial prototype to a test platform and the construction & commissioning of the 50kW test platform at the Faraday Laboratory. Next to that Frames will develop the scale-up design for the next phase, including site specific requirements and a business case for the next phase.

As a follow-up ECN.TNO is already working on a 250kW PEM system to be tested at the Hydrohub test center in Groningen, where research and stress testing at MW scale will be performed as a stepping stone towards future GW scale production of sustainable hydrogen by the process industry.

The Dutch Topsector Energy is supporting and co-funding this project

About the 'first Dutch' consortium



[ECN.TNO](#) conducts R&D in the field of renewable energy, resource and energy efficiency and provides independent policy and strategic advice. Most of these R&D activities are performed together with (international) companies and governments. Within the program Energy & Industry, ECN develops technological solutions for the energy intensive industry that accelerate the transition to a sustainable energy system.



[Frames](#) designs and constructs process installations for the global onshore and offshore oil- and gas industry. The specific business unit is specialized in utility equipment for these installations, such as hydraulic powerpacks, chemical injection and electrochemical seawater treatment systems



[Hydron Energy](#) is an innovative Dutch clean-tech company that develops, manufactures and markets high performance & cost effective PEM electrolyser stacks. Hydron Energy's mission is to enable and facilitate the large scale implementation of hydrogen technology for residential, mobility and industrial applications. The company's product portfolio encompasses a range of cutting edge PEM electrolyser stacks featuring hydrogen production capacities up to several kg/hr.



[VOLTACHEM](#) is a business-driven *Shared Innovation Program* that focusses on the electrification of the chemical industry. New technologies are developed and implemented that focus on the conversion of renewable energy to heat, hydrogen and chemicals. The project will specifically link to the *Voltachem community* which brings together chemical industry, energy companies and knowledge infrastructure. Power-to-Hydrogen is one of four program lines within VoltaChem.



[Topsector Energy \(TSE\)](#) is the driving force behind innovations that are necessary for the transition to an affordable, reliable and sustainable energy system. The transition paths from the energy agenda determine the priorities of the TSE. One of the programs is the 'TKI New Gas' where parties working on innovative production and applications of sustainable gasses from electricity, such as hydrogen