

GreenHydrogen electrolyser for onsite hydrogen generation at Nel refueling station in Sweden

Danish electrolyser manufacturer GreenHydrogen has received an order for a HyProvide™ A60 alkaline electrolyser, for onsite hydrogen generation at the Nel hydrogen refueling station in Mariestad in southern Sweden. This is the first time this electrolyser has been used for onsite generation of 'green' hydrogen at an off-grid hydrogen refueling station.

The project in Mariestad has just been awarded to GreenHydrogen's partner Nilsson Energy AB, after a public tendering process. Nilsson Energy will deliver the solution comprising a solar photovoltaic (PV) installation, hydrogen storage system, PEM fuel cells and electrolyser as a turnkey delivery in cooperation with the project partners that include PowerCell Sweden.

The hydrogen refueling station in Mariestad was inaugurated in January, with hydrogen supplied in pressurised cylinders [FCB, July 2016, p7]. However, the City of Mariestad and Väner Energi – the regional energy and utility company that operates the station – had already decided on the next, ambitious step: to go completely green and off-grid with the refueling station in 2018. This would be achieved by adding solar power, electrolysis for onsite hydrogen generation, energy storage (in the form of both hydrogen storage and batteries), and fuel cells for power generation and as backup for the solar-based power supply. The solution is designed for 24/7 operation, to ensure that fuel cell electric vehicles can be refueled with green hydrogen at any time.

For the project, GreenHydrogen will deliver a complete, containerised version of the HyProvide A60 – which produces 60 Nm³/h of hydrogen at 35 bar nominal pressure – and system integration with the Nel H2Station® dispensing front-end. GreenHydrogen's HyProvide A-series electrolysers are designed for renewable energy applications, and to run dynamically with a fluctuating supply of power

from solar PV installations and wind turbines.

The project will be delivered and commissioned next summer, and is planned to be in full operation by September 2018. Mariestad is on one of the main highways linking Gothenburg and Stockholm; earlier this year the Swedish government announced a major expansion of its hydrogen refueling infrastructure, along with the deployment of a fleet of more than 100 FCEVs [March 2017, p8].

In addition, GreenHydrogen has received an order for six advanced PEM electrolysers for integration into **hydrogen refueling stations in France**, as part of advanced hydrogen energy systems developed by its French partner Mahytec.

Five high schools have previously been selected in the Bourgogne-Franche-Comté region, in eastern France, to participate in a project that will encourage students to use this technology and learn about hydrogen energy – and the ability to store renewable energy – in order to create a zero-emissions transport sector [September 2017, p7]. A series of conferences will be arranged at the schools, for the students as well as their families, friends, and school staff.

The Mahytec solution converts renewable energy into hydrogen using a GreenHydrogen electrolyser. The hydrogen is stored in a composite tank at 30 bar and in two very low pressure metal hydride storage tanks, all produced by Mahytec. The system also allows the hydrogen to be converted back into electricity, using a fuel cell, while some of it can be used in a hydrogen refueling station to refill a fuel cell powered quadricycle (similar to a golf buggy). This has onboard hydrogen storage using low-pressure hydride, with a hybrid battery-fuel cell system to power the electric motor, allowing the teachers to demonstrate how hydrogen applications and zero-emissions mobility work in practice.

GreenHydrogen: www.greenhydrogen.dk

Nel Hydrogen: www.nelhydrogen.com

PowerCell Sweden: www.powercell.se

Mahytec: www.mahytec.com

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