D3.2 New fully integrated 70 MPa hydrogen fuelling station Oslo in Operation

Final Report

Dissemination level: PU

WP3 Deliverable D3.2

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As part of the FCH-JU supported demonstration project, H2 MOVES Scandinavia a new 70MPa hydrogen refuelling station (HRS) were to be constructed and put in operation in the city of Oslo in Norway. This report provides a short description of results of the efforts conducted and acts as the outcome of the deliverable D3.2 in the project.

The new HRS was successfully opened in Oslo in November 2011 at a public event.

The HRS is developed and manufactured by H2 Logic A/S of Denmark www.h2logic.com

Initial & realised technical specifications

The table below shows the initial technical specifications for the HRS from the H2MOVES project Description of Work (DoW) and the actual realised performance on the new HRS in Oslo.

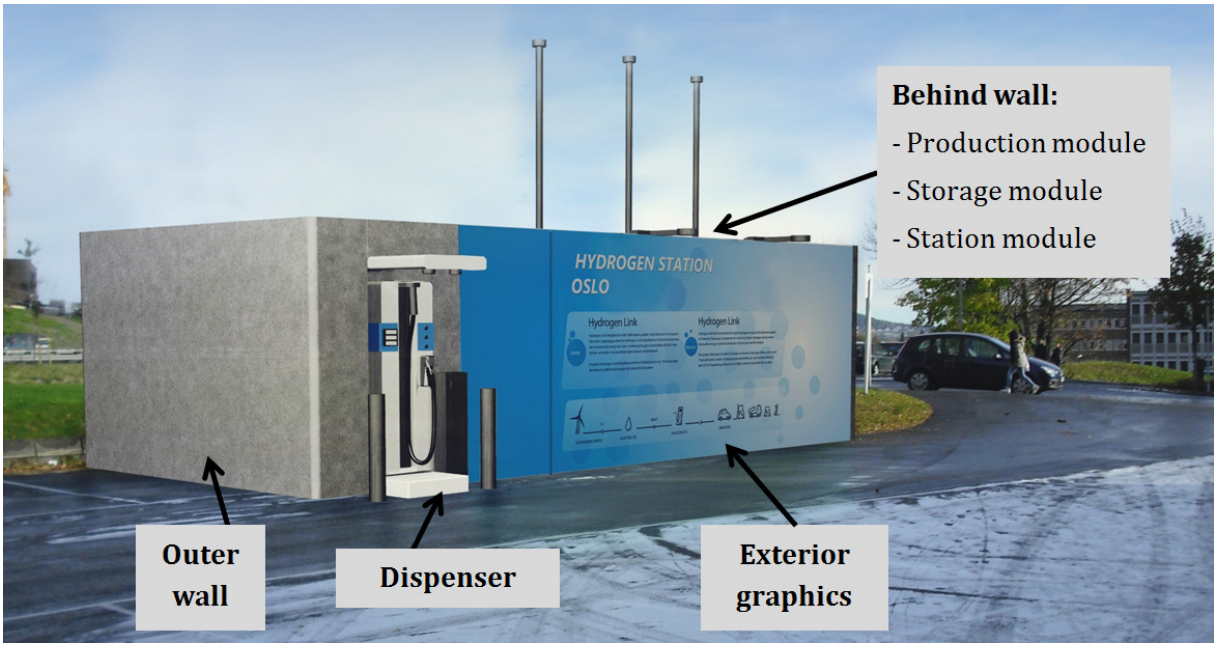
Moveable HRS – Technical specifications		
Specification parameter	**Data according to DoW**	**Actual performance realised**
Refuelling pressure	70MPa	70MPa
Control & refuelling	SAE J2601	SAE J2601
IR communication	Not specified	Yes (SAE J2799)
SAE refuelling level	Not specified	A-level (minus 40 degrees)
Refuelling time	<5 min.	3 min.
Daily refuelling capacity (24hour)	200 kg / 50 vehicles	200 kg
1 hour refuelling capacity	20 kg / 5 vehicles	20 kg
Fuel quality & composition	SAE J2719	SAE J2719
Hydrogen supply	20 kg/day onsite 180 kg/day trucked-in	20 kg/day onsite 180 kg/day trucked-in
Refueling station siting	100m2	100m2

All specifications from the DoW have been fulfilled. Concerning refueling time the actual HRS performance supersedes the initial specifications with a refueling time of 3 min. as in accordance with the SAE J2601, where the DoW anticipated less than 5 min.

Methodology for the performance specifications of the HRS is based on the requirements in the FCH-JU call text of 2008, thus it may differ from new methodologies in use today.

HRS Design

The Oslo HRS has been designed with easy installation and small foot-print in mind, as outlined in the graphical figure below.

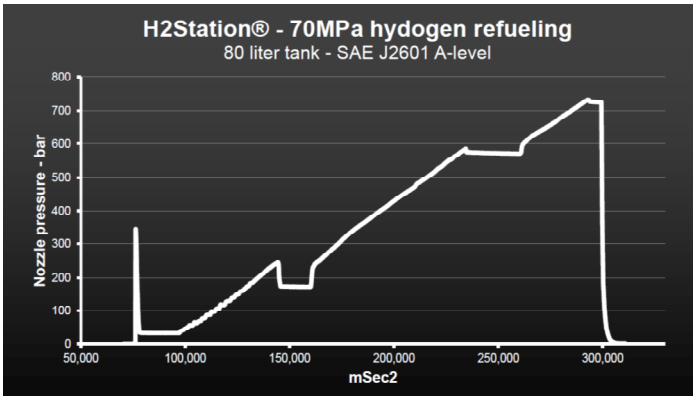


The HRS consists of four main modules surrounded by an outer wall:

- Production module - electrolyser with integrated water and hydrogen purification
- Storage module – for trucked-in hydrogen
- Station module – all refuelling equipment (compressor, storage & cooling)
- Dispenser with activation module

This modular approach was used to both ensure manufacutering of all major components at factory and an easy transport and installation. Also it has enabled a compact footprint which was required in order to integrate the HRS at the designated site.

Signifigant efforts have been spent on ensuring refueling in accordance with the specifications in the SAE J2601, and thus ensuring a fast refueling within only 3 minutes. The graphs shows an example of a 70MPa refueling at A-Level in accordance with the SAE J2601, conducted with the H2Station® technology from H2 Logic, which is used in the Oslo HRS.



HRS installation & opening

After manufacturing of the HRS modules they were shipped by truck from Denmark to Oslo in Norway. The compact design allowed for transport of all modules on one truck, except for the storage module.

In parallel with the manufacturing of the HRS modules, local works were conducted in Oslo, covering:

- Preparing of site including foundations
- Establishment of power connection
- Establishment of water connection & plumbing (for electrolyser)
- Underground pipe channels (for connection between station module & dispenser)

The installation of the HRS modules took in total 10 days, from arrival at site, until first refuelling was conducted. This included local inspection by third parties and authorities as well as several days of hydrogen production and compression to reach the necessary refuelling pressure.

Before opening of the HRS, a refuelling recommendation process was successfully conducted by Daimler, to evaluate if refuelling of Daimler FCEV's would be acceptable.

The HRS opened on 21st November 2011 and is now in daily operation. Below a picture from the HRS opening, further pictures are available at www.scandinavianhydrogen.org