# Factsheet
# OMV Research project wind2hydrogen
**May, 2019**

OMV Downstream

## Transforming renewable energy into hydrogen

The goal of the wind2hydrogen (w2h) reserach project was to set up the conditions needed to produce renewable hydrogen" to store and transport power from renewable energy in Austria which is subject to fluctuation. For this, a 100 kW pilot plant was set up at the OMV Auersthal compressor station in Lower Austria.

The pilot project should yielded new insight into storing hydrogen (H2) in the natural gas network through to hydrogen applications for transport. It enabled the simulation of future business flows in terms of power and from the viewpoint of the gas network operator. The new development of a high-pressure PEM (protonexchange-membrane) electrolyser also marked an innovative technological advance: the complex downstream compression of hydrogen was incorporated into the process as well.

### Detailed project steps

The project received funding from the Climate and Energy Fund and was realized as part of its energy research program. It ran from January 1, 2014 to December 31, 2017. Building a 100 kW pilot plant was the starting point and the entire plant started operations in summer 2015.

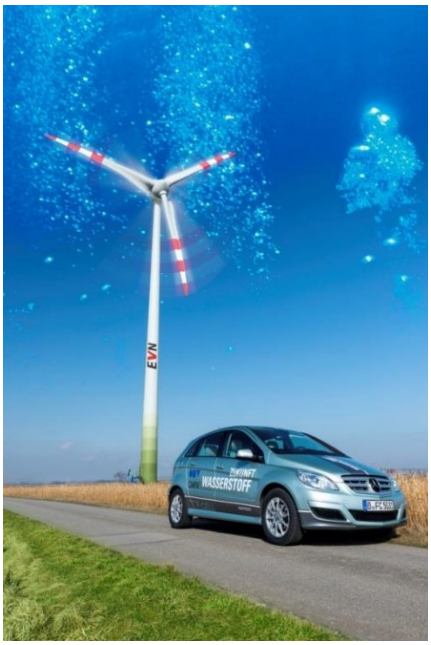
- **The world's only high-pressure electrolysis for producing green hydrogen**
  Developing a prototype of a high-pressure PEM electrolyser, specially designed for Power-to-Gas applications. This electrolyser produced high-purity hydrogen with 163 bar pressure, without any additional compressor.

- **Integrated power**
  The electrolyser was tested under different load profiles using renewable energy for flexible operations in the case of base load power, dependency on power prices, handling excess power, both for network operators and providers of regular utility services.

- **Utilizing gas infrastructure**
  By physically storing hydrogen in an OMV natural gas pipe, it was possible to develop and optimize control technology and ensure quality control. H2 integration in the natural gas infrastructure and simulating storage in the distribution network both played an important role.

- **Hydrogen from renewable energy sources for H2 mobility**
  Dynamically fluctuating hydrogen production will resulted in high-purity hydrogen being delivered to sites such as the OMV hydrogen filling stations.

- **Testing business and rollout models**
  One key component of the project was to secure and examine the economic, environmental and legal backdrop for realization in Austria.




### A way to tackle the future – Power-to-Gas

- The 2030 expansion plans call for power storage of up to 2 TWh a year (~19% of the electricity consumption in this region) in the Austrian provinces of Burgenland and Lower Austria alone. Storing and transforming this amount of energy into hydrogen in Power-to-Gas plants would be enough to power a fleet of 250,000 hydrogen-fueled cars.
- Strong demand for Power-to-Gas plants: Expanding renewable energy sources in the power sector could require installed storage capacity of up to 4 GW in Austria by 2050.

The energy for a better life.

OMV

## Strong partners on a strong project

The wind2hydrogen research project was realized in cooperation with OMV Gas & Power, Fronius International, EVN AG, HyCentA Research GmbH and the Energy Institute at the Johannes Kepler University Linz.

**OMV Gas & Power** headed the consortium and was the main sponsor, as well as providing the plot for plant construction and facilitating access to gas infrastructure at the Auersthal compressor station in Lower Austria. OMV G&P was responsible for project management, storage in the natural gas network and marketing the green hydrogen generated for use on the road.

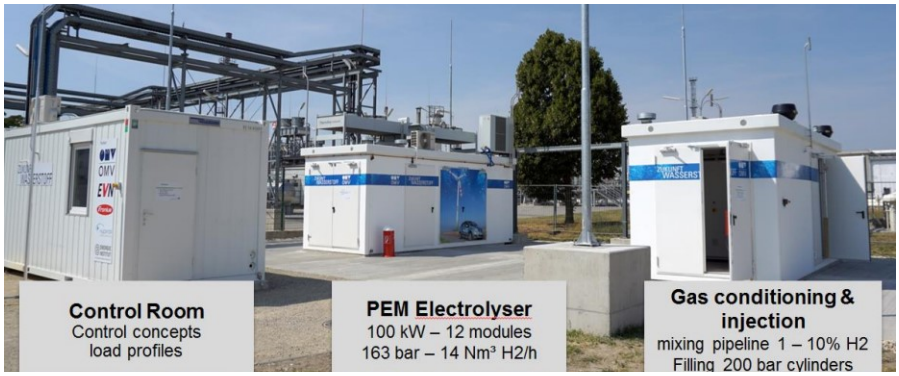
**Fronius International** provided twelve PEM high-pressure electrolysis modules and was working with HyCentA to develop the modular container system with 100 kW. Strategies for optimal module operation were developed and tested.

**EVN AG** was responsible for the simulation of various network operation modes. It developed the modes and control logarithms for operating the electrolyser, which will depicted the possible business models and applications. For example, this included consumption of excess power from the wind farm, the task of providing regular utility services, as well as price-controlled operations. Furthermore, EVN was intensely involved in the gas-related operating constraints for storage in the natural gas network.

**HyCentA Research GmbH** played a key role owing to its comprehensive expertise in hydrogen. HyCentA was responsible for the technical planning and for setting up and operating the research facility.

**The Energy Institute at the Johannes Kepler University Linz** is managed the groundwork for a roll-out and handled the economic evaluation. Key focal points included determining promising operating models, location-based optimization, economic appraisals and simulation, as well as examining legal and environmental aspects.

**wind2hydrogen pilot plant in Auersthal** (Lower Austria)




This project was sponsored by the Climate and Energy Fund and realized as part of its energy research program.
www.klimafonds.gv.at

## W2H pilot plant parameters

| | |
|---|---|
| 12 PEM modules: | total 100 kW |
| $H_2$ production: | 14.4 Nm³/h at 163 bar Hydrogen 5.0 – quality of fuel cells |
| Daily $H_2$ production (max.): | 33 kg: equivalent to the average daily consumption of 85 fuel-cell powered cars |
| Water required: | 50 l/h water |
| Electrolysis container: | 7 x 2.7 x 2.5 m |

**Contact**
**OMV Aktiengesellschaft**
**Public Relations**
Trabrennstraße 6-8
1020 Vienna, Austria
Tel.: + 43 1 40440-0
media.relations@omv.com
www.omv.com
http://youtube.com/omv