



Factsheet Hydrogen – pioneering technology

February 2018

OMV Downstream

Hydrogen on the road

Hydrogen is one of the keys to unlocking the future of transport. OMV opened Austria's first public hydrogen filling station in October 2012. To promote a new generation of environmentally sound vehicles, hydrogen is being used in tried-and-tested fuel cell technology. OMV has been researching alternative drive concepts for years and this development marks a further step towards sustainability and pollution-free mobility. As early as 2000, OMV installed a fuel cell system in the laboratory at Graz University. OMV intends to bring the results of the research to the road.

Establishing hydrogen infrastructure

The automotive and energy industries cooperate closely on hydrogen filling stations to guarantee the optimal parallel establishment of hydrogen supply and demand. Together with partners, OMV is expediting the provision of hydrogen filling stations for Austria and Germany for a future of emission-free motoring. In Germany OMV is part of the H2 Mobility initiative, which intends to build approx. 400 filling stations by 2023.

Hydrogen filling stations: kilos instead of liters

- ▶ Little difference from conventional filling stations
- ▶ Cars are filled in kilos, not liters
- ▶ Hydrogen is stored onsite
- ▶ Hydrogen is solidified and piped into a pressure tank in the vehicle via a connector
- ▶ Filling time is around four minutes
- ▶ Filling a tank with hydrogen is clean and odorless

Hydrogen

- ▶ Exists in its molecular form such as in crude oil, natural gas, coal, biomass etc.
- ▶ Generation: currently almost exclusively using fossil fuels with the steam reforming method
- ▶ Future generation from renewable energy (sun, water, wind)



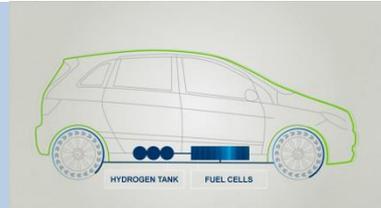
Sustainable hydrogen from renewable energy

OMV is researching methods to generate hydrogen from renewable energy:

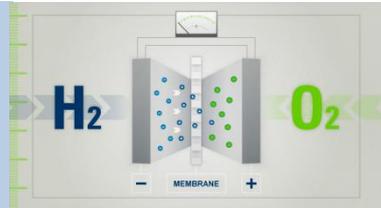
- ▶ Fuel from water and sunlight: OMV is researching how to use sustainable energy from the sun to generate hydrogen in cooperation with the Christian Doppler Laboratory in Cambridge.
- ▶ HyCentA in Graz: With a hydrogen testing center and Austria's first hydrogen delivery point, HyCentA serves as a focal point and information platform for hydrogen-related research and development. OMV is a founding partner of HyCentA GmbH.
- ▶ Power to Gas: The goal is to store excess power generated by, for example, wind power. The power is transformed into hydrogen using electrolysis. Today this hydrogen can be mixed with natural gas (up to 4 % volume) or used directly. OMV has initiated a suitable research project in cooperation with partners

Fuel cells in hydrogen technology

The range of applications for hydrogen is set to increase dramatically in the future. The energy it provides can now also be used on the road via a fuel cell system. This is twice as efficient as a combustion engine, so the same performance only takes half the energy.



Each fuel cell consists of two plate separated by a membrane. Oxygen from ambient air is supplied to one side, with hydrogen on the other. The positive particles of the hydrogen atoms are able to pass through this membrane.



The negative particles cannot pass through; however atoms need an equalizing charge. To achieve this, the electrons must change path and this creates an electrical current.



The end product from the chemical reaction is power for the drive train and H2O, i.e. pure water. This is the only emission produced by this mini power station.



Contact

OMV Aktiengesellschaft

Public Relations

Tel.: +43 1 40440-21357

E-Mail: public.relations@omv.com

Blog: <http://blog.omv.com>

Web: www.omv.com

Social: <http://youtube.com/omv>