INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update October 2015: Austria

The IPHE Secretariat requests each IPHE member submit a one-page narrative update on hydrogen and fuel cell (HFC) activities. Please only report actions and developments since the last Country Update and leave Sections blank if there have been no new developments.

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1. New Policy Initiatives on Hydrogen and Fuel Cell

By the end of 2025 Austria will establish a sufficient number of publicly available filling stations with uniform standards to meet expected market demand. Austria is currently working on the national strategic framework with the involvement of all stakeholders to fulfil the DIRECTIVE 2014/94/EU.

The Austrian Association for Advanced Propulsion Systems launched its Technology Roadmap "Eco-Mobility 2025 plus", which has a FCH focus.

Funding Programs:

- Mobility of the Future: EURO 6 Mio.
- KLIEN: EURO 1,9 Mio.

2. Hydrogen and Fuel Cell R&D Update

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3. Demonstration and Deployments Update

- **Underground SUN.STORAGE**

Compared with the storage technologies currently available for electricity, gas grids have enormous storage capacity. If electricity is converted into hydrogen, the existing infrastructure for natural gas, consisting of pipelines and gas storage facilities, can be used to buffer surplus energy from renewables.
For further information, please see: http://www.underground-sun-storage.at/en.html

- **HylyPure** *Recovering green hydrogen without wasting energy*

The Wind2Hydrogen strategy involves storing hydrogen in the natural-gas grid and delivering it (mixed with natural gas) to individual consumers at low cost. For the hydrogen to be available as a feedstock in the chemical industry, or for transport applications in fuel cell quality, it is essential to recover it in pure form from the mixture.
For further information, please see:
http://www.vt.tuwien.ac.at/thermal_process_engineering_and_simulation/computational_fluid_dynamics/projects/current_projects/hylypure/EN/

- **E-LOG-BioFleet** *Fuel cell range extender for pallet trucks*

In the largest market for electric powertrains, the pallet truck segment (in 2011 the worldwide sales volume came to 950,000 units), exclusively battery-powered vehicles cause limited productivity, particularly in multi-shift operation. The critical factors here are the vehicle's restricted range and the length of time it takes to recharge their batteries.
For further information, please see:
http://www.fronius.com/cps/rde/xchg/fronius_international/hs.xsl/17_20056_ENG_HTML.htm?inc=96847.htm#.VnpwUPnhDcs

- **Wind2Hydrogen (W2H)** *Pilot plant to generate hydrogen from renewables*

The aim of the power-to-gas development thrust is to couple the electricity and natural-gas grids together. A key element in the forthcoming system are flexible, efficient, cost-effective electrolysers. An Austrian consortium made up of OMV, EVN, FRONIUS International GmbH, HyCentA Research GmbH and the Energy Institute at the Johannes Kepler University (JKU) Linz is currently researching how to generate "green hydrogen" by means of a novel type of high-pressure electrolyser, how to feed the hydrogen generated into the natural-gas grid, and how to fill and employ it in motor vehicles.
For further information, please see:
http://www.omv.com/portal/01/com/omv/OMV_Group/Sustainability/Eco_Innovation/wind2hydrogen

- **IEA RESEARCH COLLABORATION** *International research on fuel cell technology*

The Implementing Agreement "Advanced Fuel Cells (AFC)" of the International Energy Agency (IEA) is intended to boost the development of key components and systems for fuel cells in the IEA member states. The main emphasis is on analysing the market environment and on providing support for market entry by developing the necessary political framework and instruments.

- **ASys I & II** *Fuel cell technology for mobile generators*

The mobile generators used for air conditioning and to power electrical appliances in long-range goods vehicles, caravans or boats when these are stationary, feature internal-combustion engines that drive a generator. With their low ratings these small engines are very inefficient and involve rather a lot of noise and pollution.
For further information, please see: https://www.avl.com/fuel-cell-engineering1/-/asset_publisher/gYjUpY19vEA8/content/fuel-cell-engineering-for-heavy-duty-on-and-off-road-vehicles?inheritRedirect=false&redirect=https%3A%2F%2Fwww.avl.com%3A443%2Ffuel-cell-engineering1%3Fp_p_id%3D101_INSTANCE_gYjUpY19vEA8%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview%26p_p_col_id%3Dcolumn-2%26p_p_col_count%3D1

4. Events and Solicitations

- 10th A3PS-Conference - "Eco-Mobility 2015": November 9th & 10th, 2015
- IEA-AFC - TASK 34 Workshop: 11th November, 2015
- 37th International Vienna Motor Symposium: 28th April, 2016
- 28th International AVL Conference "Engine & Environment": 9th Juni, 2016

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

Call 2012/13: 11 funded projects → 7,3 M€ Funding
4 FCH-projects funded with 3,0 M€

Call 2013/14 - topics: 13 funded projects → 6,2 M€ Funding
3 FCH-projects funded with 2,5 M€

Call 2014/15 - topics:
16 submitted projects → 12,0 M€ requested funding
20,7 M€ total budget
5 funded projects → 6,5 M€ Funding

FCH-Projects:
9 submitted projects → 8,7 M€ requested funding
15,0 M€ total budget
3 FCH-projects funded with 5,1 M€

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Summary Country Update October 2015: Austria

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles[1]	-	-	-	-
FC Bus	No target	No Demo	-	-
Fuel Cell Trucks[2]	No target	-	-	-
Forklifts	No target	10	e.g. E-LOG-BioFleet	• Funding
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
70 MPa On-Site Production	-	-	-	-
70 MPa Delivered	According to the EU directive 94: basic-network consisting of 5 HRS	2	HyFive (one Station)	-
35 MPa On-Site Production	-	-	-	-
35 MPa	1	1		

[1] Includes Fuel Cell Electric Vehicles with Range Extenders
[2] As above

Delivered				
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Small[4]	-	-	-	-
Medium[5]	Commercialize by 2017	-	-	-
Large[6]	No target	-	-	-
District Grid[7]	No target	-	-	-
Regional Grid[8]	No target	-	-	-
Telecom backup	No target	-	-	-
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Fossil Fuels[10]	CO2-free Hydrogen by 2040	-	-	-
Water	CO2-free	-	-	-

[3] Targets can be units installed and/or total installed capacity in the size range indicated
[4] <5 kW (e.g., Residential Use)
[5] 5kW – 400 kW (e.g., Distributed Residential Use)
[6] 0.3MW – 10 MW (e.g., Industrial Use)
[7] 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)
[8] 30MW plus (e.g., Grid Storage and Systems Management)
[9] Target can be by quantity (Nm^3, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target
[10] Hydrogen produced by reforming processes

Electrolysis[11] (PEM, Alkaline, SOEC)	Hydrogen by 2040			
By-product H_2	-	-	-	-
Energy Storage from Renewables	**Target[12]**	**Current Status**	**Partnership, Strategic Approach**	**Policy Support**
Power to Power[13] Capacity	-	-	-	-
Power to Gas[14] Capacity	-	-	-	-

[11] Please indicate if targets relate to a specific technology (PEM, Alkiline, SOEC)
[12] Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity
[13] Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity
[14] Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)