INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update April 2018: The Netherlands

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1. New Initiatives on Hydrogen and Fuel Cell

At the request of the Ministry of Economic Affairs and Climate Policy, TKI Nieuw Gas produced a report, "Outlines of a Hydrogen Roadmap", published March 2018. The objectives of this report are to:

- Indicate the potential of hydrogen in a sustainable energy system in 2050;
- Give an overview of actors and activities on hydrogen in the Netherlands; and,
- Advise what steps should be taken and which activities are necessary to realise the potential of hydrogen.

Headlines/Conclusions:

Hydrogen is an essential element for the energy transition, towards a zero-emission society by 2050. The report states that investments now are necessary in pilots and demonstration projects to build up experience, especially in industry and mobility, the most promising markets for sustainable hydrogen.

Innovations remain important to enable new applications and to reduce further the costs of technology and systems, and hence the cost of hydrogen.

Hydrogen is important as interconnector in the energy system. Hydrogen offers flexibility because of the different application possibilities. It connects markets such as (offshore) wind farms and the chemical industry where they can use hydrogen to generate high temperature heat and as a raw material for chemicals in the production of ammonia, for example.

Hydrogen is a sustainable alternative to carbon-based energy carriers, such as diesel in trucks, ships, and trains where battery-electric solutions are not sufficient. It can replace natural gas in the existing built environment. Hydrogen also offers large-scale storage for longer periods. Transport of hydrogen can use the current gas infrastructure.

The "Outlines of a Hydrogen Roadmap" will be an input for the discussions and policy initiatives in the framework of the National Agreement on Climate Change, to be concluded (before) Summer 2018.

2. Hydrogen and Fuel Cell R&D Update

A Call from the R&D programme (sustainable) Hydrogen was published in June 2017 and closed on 7 November, with 10 applications received.

Topics for research are industrial applications of hydrogen (high temperature), mobility (zero emission), and power supply (system integration of hydrogen and energy-storage). First results are expected in Q1 2018. Total Budget: €750K.

This R&D programme made a Second Call in March 2018.
Budget of this Call: €3.88million

3. Demonstration and Deployments Update

A 4th hydrogen refuelling station (HRS) recently opened in Groningen (northern part of NL). For now, this HRS only refuels at 350 bar, and is especially designed for a (demonstration) project of 2 FC Buses for public transport in the Groningen-area. This demonstration project started in February 2018.

4. Events and Solicitations
N/A

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

Programme for the demonstration of low-carbon technologies and innovations in transport
Multi-annual demonstration programme (financing for example Living Labs) was published in October 2017
Budget Call of 2017/2018: €17Million
Focus of this Call 2017/2018:

- Acceleration of development of low-carbon vehicles (transportation of goods and passengers (M2);
- Deployment and use of infrastructure for alternative fuels; and,
- Co-financing of EU-supported infrastructure for alternative fuels (mainly hydrogen).

Results of the 2017/2018 Call: 12 new HRS will be built in NL. These HRS will come into service by the end of 2019.

6. Regulations, Codes & Standards Update

The Hydrogen Innovation Safety Program was set up and launched in 2017. Program Leader is NEN, the Dutch Normalisation and Safety Institute. Several working groups are operational, on the subjects of:

- Permit for a HRS;
- Risk management and instructions for the First Responders; and,
- Codes and Regulations.

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Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles[1]	2000 by 2020	41 (March 2018)	Working Group Demand Gathering, (part of the Dutch Hydrogen Platform). Main Task: Stimulate en co-ordinate activities of fleet-owners and HRS-bisuness	Some Fiscal measures: • No purchase tax (BPM) • No road tax (MRB). • Low addition of 4% (instead of 22%). per year (Income tax) Fiscal rebate on investments in a hydrogen car. Link to this subsidy/fiscal rebate scheme: https://english.rvo.nl/subsidies-programmes/mia-environmental-investment-rebate-and-vamil-arbitrary-depreciation-environmental-investments
FC Bus	100 by 2020	12 (scheduled), 6 in operation	Green Deal Zero Emission Public Transport by Bus.	• Fiscal rebate on investments in a hydrogen bus
Fuel Cell Trucks[2]	500 vans and 20 trucks by 2020	2 (March 2018)	Green Deal Zero Emission InnerCity Logistics https://greendealzes.connekt.nl/en/the-livable-city/	
Forklifts	No target	0		

[1] Includes Fuel Cell Electric Vehicles with Range Extenders

[2] As above

H_2 Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
70 MPa On-Site Production	20 by 2020	1	Covenant (Green Deal) Sustainable Hydrogen Economy	Subsidy Scheme: Up to 90% Subsidy Investments costs for a HRS
70 MPa Deliv.		1		
35 MPa On-Site Production	20 by 2020	2 (Feb. 2018)		
35 MPa Del.		2		
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Policy Support**
Small[4]	No target			
Medium[5]	No target			
Large[6]	No target			
District Grid[7]	No target			
Regional Grid[8]	No target			
Telecom backup	No target			

[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)

H_2 Production	Target[9]	Current Status	Partnerships, Strategic Approach	Policy Support
Fossil Fuels[10]	Climate neutral as soon as possible (no CO2- emission well to wheel)	Large share of fossil fuelled H2-production (by SMR)	Covenant (Green Deal) Sustainable Hydrogen Economy	
Water Electrolysis[11] (PEM, Alkaline, SOEC)	No target			
By-product H_2	No target			
Energy Storage from Renewables	**Target[12]**	**Current Status**	**Partnership, Strategic Approach**	**Policy Support**
Power to Power[13] Capacity	No target			
Power to Gas[14] Capacity	No target			

[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
[11] Please indicate if targets relate to a specific technology (PEM, Alkaline, 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)

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