



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update November 2021: The Netherlands

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1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

- [Working plan for the National Hydrogen Programme](#) presented to the Vice-Minister of Economics Affairs and Climate Policy (July 2021). Document can be downloaded [here](#) (in Dutch).
- Study [HyWay27](#) completed and [presented to the Parliament](#). First steps in developing a national hydrogen transport grid and storage. The study shows that the existing natural gas network can be used for the transport of hydrogen and that this is desired. Transport capacity for hydrogen is needed within and between regions, storage and abroad before 2030. The national hydrogen network can ensure the efficient connection of users and suppliers to each other and to storage.
- Joint statements on collaboration on hydrogen with [Chile](#) (July 2021), Uruguay (Nov 2021) and upcoming with Namibia and Canada.
- [Joint position paper of the pentilateral Energy Forum on the regulatory framework for hydrogen](#) (September 2021)

2. Hydrogen and Fuel Cell R&D Update

There is no specific information on cost reduction and enhanced performance of FCH technologies at our disposal. In December 2020, TKI New Gas published an analysis on hydrogen projects subsidized over the last 8 years. In the period from 2012-2020, 76 projects were subsidized, amounting to €27,916,303. The total investment is estimated to be approximately €46.5. 13% of the total budget was awarded to 32 projects in the concept phase (research of ideas and new products) and 87% of the budget was destined for technology development projects where the TRL of a specific product was improved. The report (in Dutch) can be found [here](#).

3. Demonstration, Deployments, and Workforce Developments Update

There are numerous projects undertaken by Dutch industry, small and medium enterprises, research institutes, consultants, NGOs and regional governments aiming at realizing the potential role of hydrogen as established in the National Hydrogen Strategy. TKI New Gas has recently published an update of the projects overview with over 130 active Dutch pilots and demonstration projects on hydrogen. This overview can be found [here](#).

Highlights since the last update include the following projects:

- Successful start demo project with **hydrogen storage in salt caverns**-[Hystock](#) (Sept 2021)
- First **hydrogen tractor** in Stadsboerderij Almere, NL (H2Trac Arnhem) June 2021
- **Hydrogen demo house** opened "Hydrogen Experience Center" from grid operator Alliander as training location May 2021.



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- TU Delft Solar Team developed the first **flying hydrogen boat** in the world, the “Hydro Motion” May 2021
- Two **garbage trucks** on hydrogen in Helmond, NL operational since May 2021.

4. Events and Solicitations

- [H2 World B2B meetings](#), 10 Nov 2021 – 19 Nov 2021, Ulsan, South Korea
- [Hydrogen Industry Cluster WIC Conference 2021-Joining Forces for a Sustainable Hydrogen Region](#)
- [World Hydrogen Summit and Exhibition](#) 8-10 March 2022 in Rotterdam, NL
- [Hydrogen Economy Europe](#), 8-9 June 2022 in Amsterdam. Reuters online event

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

A details summary of the subsidy possibilities is presented at the [website](#) of the National Hydrogen Programme (info in Dutch).

- PoSHYdon: first offshore H2 production pilot begins (July 2021 €3,6M from DEI+) July 2021
- The Province of Groningen received €5,8M from the Blending Facility Programme of Connecting Europe Facility (CEF) for hydrogen trains (July 2021).
- The Government announced in September (as part of the yearly budget planning) that it will assign €6.8B in 2022 for measures to help the climate (September 2021). More than €1B of this budget will be destined for hydrogen. Among which, €750M are reserved for the development of the hydrogen transport infrastructure (backbone), €250M for a subsidy scheme to scale up hydrogen production via electrolysis, €35M for the first IPCEI projects and €35M for large scale hydrogen storage.

6. Regulations, Codes & Standards, and Safety Update

The National Climate Agreement mandates that statutory and regulatory flexibility can be created for experiments to allow regional and national network operators to gain experience in the transport and distribution of hydrogen. It has been announced that the Gas law will be amended to allow gas network operators to distribute hydrogen, given that the conditions of security of supply and safety are guaranteed. This trajectory will be soon started and could take up to 1.5 years until it can be implemented.

The Netherlands is facing a great reorganization of the environmental laws by July 2022, which also include the Hydrogen Refuelling Stations (HRS) safety regulations. An unofficial translation of this “Environment and Planning Act” is available [here](#). Together with the implementation of the Environment and Planning Act the determination of safety distances might change: it is expected that fixed safety distances will be obligatory for HRS rather than requiring Quantitative Risk Assessments (QRA).

At the start of 2020, the Netherlands launched the four-year Hydrogen Safety Innovation Programme, which is a public-private partnership between the national government, network operators, emergency services, knowledge institutes and companies. The programme identifies safety issues in the area of hydrogen and proposes policies and agreements that allow these issues to be adequately addressed.



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The Safety Programme focuses on the national level but aims to implement international developments. The work concentrates around six working packages:

1. WP1: harmonization of the permitting process for HRS by developing guidelines
2. WP2: risk and incident management
3. WP3: legal aspects, including the finding of white spots
4. WP4: safety risks inventory for production, storage, transport and hydrogen use
5. WP5: HAZID-studies on the use of hydrogen in public spaces
6. WP6: International knowledge and lessons learnt

The Dutch government also works on a temporary safety policy framework for hydrogen demonstration and pilot projects.

A new study on safety issues of future hydrogen supply chains will be published before the end of 2021.



Summary Country Update November 2021: The Netherlands

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles ¹	2.000 by 2020 15.000 by 2025 300.000 by 2030	442 as of September 2021	<ul style="list-style-type: none"> • New National strategy to be launched in 2022 for hydrogen in mobility • The province of Utrecht has recently signed a covenant with business developers, knowledge institutes, regional governments to stimulate the use of green hydrogen in the province. There are targets established for the period from 2021-2025 that cover 10% of the national ambitions from the Dutch Climate Agreement. 	<ul style="list-style-type: none"> • No new updates since last update
FC Bus	100 by 2020 300 by 2025	25 as of September 2021		<ul style="list-style-type: none"> • No new updates since last update
Fuel Cell Trucks ²	500 by 2020 3500 by 2025	29 as of September 2021 (N1, N2 and N3 category)		No new updates since last update
Forklifts	No target	0		<ul style="list-style-type: none"> • No new updates since last update

¹ Includes Fuel Cell Electric Vehicles with Range Extenders

² As above



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H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
70 MPa On-Site Production	20 by 2020 50 by 2025 (target on total HRS)	1 as of June 2021 (Helmond, dual 70/35 MPa)	<ul style="list-style-type: none"> • 25 have already received financing for constructing and are on the way. 	<ul style="list-style-type: none"> • Up to 100% subsidy of the investment costs for a public HRS. No subsidy for operation.
70 MPa Delivered	No target	1 as of June 2021 (Amsterdam)		
35 MPa On-Site Production	No target	1 as of September 2021 (Nieuwegein)		
35/70 MPa dual Delivered	No target	5 as of June 2021		
Stationary	Target Number ³	Current Status	Partnerships, Strategic Approach	Support Mechanism
Small ⁴	No Target	0	-	-
Medium ⁵	No Target	0	-	-

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)



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Large ⁶	No target	0	-	-
District Grid ⁷	No Target	0	-	-
Regional Grid ⁸	No Target	0	-	-
Telecom backup	No target	0	-	-
H ₂ Production	Target ⁹	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fossil Fuels ¹⁰	Climate neutral H ₂ by 2050	175 PJ/year (Total hydrogen supply in NL)		
Water Electrolysis ¹¹ (PEM, Alkaline, SOEC)	500 MW by 2025 3-4 GW by 2030	3 MW	National Climate Agreement and H ₂ Programme	EIA (45 % fiscal deduction), DEI+, SDE++ & new upscaling instrument
By-product H ₂	No target	A small part of the 175 PJ/ year	Production based on chlorine-alkali production process where H ₂ comes as by product in Rotterdam and Groningen harbour area.	

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 (Nm³, 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)



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Energy Storage from Renewables	Target ¹²	Current Status	Partnership, Strategic Approach	Support Mechanism
Installed Electrolyser Capacity	500 MW by 2025 3-4 GW by 2030	3 MW	National Climate Agreement and H ₂ Programme	EIA (45 % fiscal deduction), DEI+, SDE++ & new upscaling instrument
Power to Power ¹³ Capacity	No target	-	-	-
Power to Gas ¹⁴ Capacity	No target	-	-	-

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)