



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update April 2022: The Netherlands

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

- The Ministry of Economic Affairs and Climate Policy performed a market [consultation](#) on the development and regulation of a hydrogen market (March 2022).
- The National Hydrogen Program (“Nationaal Waterstof Programma” or NWP) started in January 2022 as a public-private partnership which contributes to achieving the large hydrogen ambitions. The NWP will support application of hydrogen in various sectors and help to achieve the goals in the field of hydrogen by facilitating and accelerating initiatives, as well as enabling the collaboration between various stakeholders and monitoring the progress.
- New fiscal incentive for hydrogen via the Energy Investment Deduction ([EIA](#)) for the production of hydrogen via electrolysis, stationary storage of hydrogen and connection to private hydrogen networks.
- The new government’s coalition agreement presented in December 2021 reinforced the commitment to achieve a clean energy system where hydrogen plays a fundamental role, by providing a €35 billion Climate Fund, where at least €15 bln will be destined for sustainable gasses, such as hydrogen.
- December 2021 – [Letter](#) to the Parliament over the organization and development of a hydrogen market, and outline of the import strategy
- The Netherlands continues to develop its international import strategy, for which it has developed several joint statements in 2021 with [Chile](#), [Uruguay](#), [Namibia](#), [Canada and, in February 2022, with UAE](#). The Netherlands is also participating in the international discussions on trade, certification, upscaling, market development and more via de multilateral forums, such as IPHE, IRENA, IEA H2 TCP, Clean Energy Ministerial and the Hydrogen Ministerial.

2. Hydrogen and Fuel Cell R&D Update

TKI Nieuw Gas published a summary on the hydrogen innovation projects of the past 10 years in The Netherlands. [130 subsidized projects](#) were carried out in the period 2012-2021, some of which are still on-going. The most important conclusions are:

- There is a change of interest from specific technologies to projects with a more integrated perspective.
- There are a large number of research projects on small scale water electrolysis (0,1-1MW)
- A small number of projects are focused on the realization of water electrolysis on the scale of 10-20 MW
- There are several integrated hydrogen projects on local scale (production, storage and use in residential heating, mobility, industry and agriculture)



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- Hydrogen application in mobility is the most developed from all the applications. The last 2 years the focus has shifted from tank stations and fleet development to maritime applications and agriculture vehicles (related to the NOx emission problems in The Netherlands).
- Too little innovation projects on hydrogen application in the industry, given the importance of it in this sector.
- There is a lot of attention to hydrogen measurement, quality and the development of sensors. Good results have been delivered on this topic.
- There is a good cooperation between research institutes, universities and small and large companies within the projects carried out.

The report can be found [here](#) (in Dutch).

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 published an update of the projects overview with over 130 active Dutch pilots and demonstration projects on hydrogen. This overview can be found [here](#).

TKI New Gas have also recently provided a summary of national and international hydrogen activities/organisations and relevant developments in The Netherlands. This report can be found [here](#).

Since the last update we would like to highlight the following projects:

- [Development of import terminal for hydrogen carrier in port of Rotterdam | Port of Rotterdam](#): Gasunie, HES International and Vopakhave announced a collaboration to construct an ammonia import terminal in 2026 in the Port of Rotterdam.
- Ship Antoine: The construction of the first hydrogen powered inland ship in The Netherlands has begun on 30th March. First PV-powered hydrogen production site commissioned in Oosterwolde (March 2022) by network company Alliander and GroenLeven. Alliander and GroenLeven will investigate how hydrogen can play a role in areas where the capacity of the electricity grid is not sufficient to return large-scale generated solar energy.
- [Flex H2](#) - demonstrate of offshore wind to green hydrogen production (€4 mln subsidy), December 2021
- [Symbatt](#) – project that will implement and test the battolyser concept which integrates generation, marketing and interim storage and conversion to hydrogen in one chain (€3,2 mln subsidy), December 2021
- [First dutch home heated by hydrogen](#) connected to a local, underground hydrogen network – November 2021

4. Events and Solicitations

Provide information on upcoming hydrogen-related events that will include international participants. Also, please provide any information regarding solicitations¹ that can lead to collaboration among IPHE members.

¹ Can include *Requests for Information* and *Calls for Proposals* and other requests that may or may not involve funding support but looks to address issues that may be of interest to IPHE members



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- [World Hydrogen Summit and Exhibition](#) 9-11 May 2022 in Rotterdam, NL
- [Scale-up production, secure off-takers, lead the hydrogen economy](#), Reuters Event, 8-9 June 2022, Amsterdam, NL
- Wind meets Gas symposium, October 2022 (tbc), Groningen, NL

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).

In 2020 an analysis on innovative hydrogen projects in the period between 2012 and 2019 was carried out. A total of 76 projects, supported by different government subsidies were analysed. The total amount subsidized accounted to € 27,916,303. The total investment is estimated to be approximately €46.5 million. 13% of the total budget was awarded to 32 projects in 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. More information can be found in the [report](#) (in Dutch).

A specific subsidy of TKI Nieuw Gas for innovative hydrogen technologies granted 13 projects a total budget of €3 million in January 2022. The projects can be divided in the following categories:

- Electrolysis and electrolyser systems: 3 projects
- Sensors and measurement technologies: 3 projects
- Burners and modeling of burner technology: 2 projects
- Storage and liquefaction: 2 projects
- Production of electrolyzers and fuel cells: 2 projects
- Complete systems and system integration: 1 project

[Here](#) is the public summary of the projects which received the grants.

€500million was granted from the second round of the National Growth Fund (April 2022) to the project GroenvermogenII (Green Capacity II), focused on the realisation of green hydrogen production projects of at least 100 MW in The Netherlands.

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 per 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).



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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.

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.



Summary Country Update April 2022: the Netherlands

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles ²	2.000 by 2020 15.000 by 2025 300.000 by 2030	491 as of 31-01-2022	<ul style="list-style-type: none"> 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	41 as of 31-01-2022		<ul style="list-style-type: none"> No new updates since last update
Fuel Cell Trucks ³	500 by 2020 3500 by 2025	14 commercial vans (<3.5 ton) and 15 commercial Trucks as of 31-01-2022		No new updates since last update
Forklifts	No target	0		<ul style="list-style-type: none"> No new updates since last update
H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism

² Includes Fuel Cell Electric Vehicles with Range Extenders

³ As above



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70 MPa On-Site Production	20 by 2020 50 by 2025 (target on total HRS)	- 1 HRS with on-site production as of June 2021 (Helmond, dual 70/35 MPa)	• 25 have already received financing for constructing and are on the way.	• Up to 100% subsidy of the investment costs for a public HRS. No subsidy for operation.
70 MPa Delivered		- 6 dual delivered 35/70 MPa HRS as of 31-01-2022		• e.g., No Subsidy for installation • e.g., Subsidy for operation
35 MPa On-Site Production		- 1 HRs 700 MPa only (Amsterdam)		• e.g., Subsidy for installation through a tax measure of an annual 50% capital expenditure write-off
35 MPa Delivered				
Stationary	Target Number ⁴	Current Status	Partnerships, Strategic Approach	Support Mechanism
Small ⁵	No Target	0	-	• -
Medium ⁶	No Target	0	-	-
Large ⁷	No target	0	-	-
District Grid ⁸	No Target	0	-	• -
Regional Grid ⁹	No Target	0	-	-

⁴ Targets can be units installed and/or total installed capacity in the size range indicated

⁵ <5 kW (e.g., Residential Use)

⁶ 5kW – 400 kW (e.g., Distributed Residential Use)

⁷ 0.3MW – 10 MW (e.g., Industrial Use)

⁸ 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

⁹ 30MW plus (e.g., Grid Storage and Systems Management)



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Telecom backup	No target	0	-	-
H₂ Production	Target¹⁰	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fossil Fuels ¹¹	Climate neutral H ₂ by 2050	175 PJ/year (Total hydrogen supply in NL)	•	
Water Electrolysis ¹² (PEM, Alkaline, SOEC)	500 MW by 2025 3-4 GW by 2030	4 MW	National Climate Agreement and H ₂ Programme	EIA (45 % fiscal deduction), DEI+, SDE++ & new upscaling instrument, National Growth Fund
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.	
Energy Storage from Renewables	Target¹³	Current Status	Partnership, Strategic Approach	Support Mechanism
Installed Electrolyser Capacity	500 MW by 2025 3-4 GW by 2030	4 MW	National Climate Agreement and H ₂ Programme	EIA (45 % fiscal deduction), DEI+, SDE++ & new upscaling instrument

¹⁰ Target can be by quantity (Nm³, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

¹¹ Hydrogen produced by reforming processes

¹² Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

¹³ Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity



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Power to Power ¹⁴ Capacity	No target	-	-	-
Power to Gas ¹⁵ Capacity	No target	-	-	-

¹⁴ Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

¹⁵ 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)