



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update October 2019: Germany

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

The Federal German Government presented a draft for the first [Climate Action Law](#) of Germany in October 2019. The law is one element in a package of climate legislation and policy programs to ensure Germany reaches their climate targets of 2030. The law includes different measures for climate protection like a phase-out of energy production from coal and the deployment of renewable energy production.

Within the consultation process, hydrogen and fuel cell technologies were identified as important technologies to reach Germany's climate targets. Therefore, a National Hydrogen Strategy is under development by four ministries: Federal Ministry for Economic Affairs and Energy (BMWi), Federal Ministry of Transport and Digital Infrastructure (BMVI), Federal Ministry of Education and Research (BMBF) and Federal Ministry for Economic Cooperation and Development (BMZ). The National Hydrogen Strategy will be introduced in December and will contain the framework for further activities of the German government regarding hydrogen technologies up to 2030.

2. Hydrogen and Fuel Cell R&D Update

The Ministry for Economic Affairs and Energy presented the [winners of the competition](#) for large scale R&D projects within the 7th Energy Research Programme. With these projects, future-oriented energy technologies are being tested under real conditions and on an industrial scale. The central topic in the competition is the production, distribution and usage of low-carbon hydrogen among different sectors. A total of [20 projects](#) have been selected of which 11 projects have a directly related to hydrogen production or usage. In total, a PtX capacity of around 330 MW is addressed with these 11 projects.

The Federal Ministry of Transport and Digital Infrastructure has selected [9 regions](#) for the first (HyStarter) of three phases of the HyLand projects within the National Innovation Programme Hydrogen and Fuel Cells (NIP). These regions are Kiel, Rügen-Stralsund, Schaumburg, Lausitz, Weimar, Marburg, Neustadt an der Waldnaab, Reutlingen and Allgäu. Each of the regions or municipalities is advised on the organization and on the conception of the project for about one year. This includes forming a stakeholder landscape (e.g., political representations, municipal enterprises, industry, commerce, society), and jointly developing initial concept ideas on hydrogen and fuel cells, based on renewable energies in transport, but also in the areas of heat, electricity and storage.

The project [ELEKTRA](#) started in August funded by the NIP. The energy supply on the tugboat will be solely by gaseous hydrogen, fuel cells and batteries. Construction is scheduled to begin in October 2019, with completion by the shipyard scheduled for the fourth quarter of 2020. The ELEKTRA is to be used primarily in the transport of goods on the Berlin-Hamburg route and inner-city transport routes in Berlin.



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3. Demonstration, Deployments, and Workforce Developments Update

The NIP is funding market deployment of fuel cell technologies in the transportation sector. This includes passenger cars, busses, trains and other mobile applications with fuel cell technologies. By October, 152 fuel cell vehicles had been registered in 2019 which sums up to 530 FCEVs in Germany. For those FCEVs, 76 hydrogen refuelling stations are available.

In the first half of 2019, more than 1,100 fuel cell heating systems for domestic buildings up to 5 kW have been granted for public funding. In total, 6,600 fuel cell systems for heating are in place in Germany.

4. Events and Solicitations

April 20 – 24, 2020 [Hannover Messe](#)

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

The second phase of the National Innovation Programme for Fuel Cell and Hydrogen Technology, in place since 2016, relies on two funding mechanisms. One mechanism addresses R&D projects, directly linked to FCH topics. Several projects were approved with most providing support for market uptake by decreasing costs and increasing product lifetime. Single components as well as complete systems and production chains are considered within the approved projects. A brief overview of all projects of 2018 is given in the [annual report](#) of the NOW GmbH.

The other funding mechanism within the NIP is to support investment deploying FCH technologies. For example, the purchase of about 150 cars received funding support as mentioned above. Many of the fuelling stations now in operation were funded by the NIP that also includes, in some cases, support for the production of hydrogen by water electrolysis.

6. Regulations, Codes & Standards, and Safety Update

With approval of the Renewable Energy Directive at the European Level, discussions are now underway on its integration into the national framework. It will be important to generate incentives for integration of advanced fuels into the fuel mix including hydrogen as an advanced fuel in upstream processing. This might lead to large-scale deployments of water electrolysis systems in refineries.



Summary Country Update October 2019: Germany

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles ¹	No target	530 (Oct. 2019)	•	• Subsidy for purchase for fleets (NIP II 3 rd Call) incl. construction of refueling infrastructure
FC Bus	No target	21 buses (Oct. 2019)	Joint procurement in Europe, funded by JIVE, FCH-JU and NIP I and II	• Subsidy for purchase (NIP II call 2018) incl. construction/installation of refueling infrastructure
Fuel Cell Trucks ²	No target	2 trucks (Oct. 2019)		NIP R&D activities
Forklifts	No target	Approx. 100 (Oct. 2019)	Industry Network Clean Intralogistics Net (CIN)	• NIP market activation
H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
70 MPa On-Site Production	No target	n.a.	• H2 Mobility	• Subsidy for construction/ installation for publicly accessible stations for road transport (NIP II Call 2018) incl. on-site electrolyser
70 MPa Delivered	100 by 2020 400 by 2025	76 (Oct. 2019) 16 planned	H2 Mobility	• Subsidy for construction/ installation for publicly accessible stations for road transport (NIP II call 2018)
35 MPa On-Site Production	No target	n.a.		• e.g., Subsidy for installation through a tax measure of an

¹ Includes Fuel Cell Electric Vehicles with Range Extenders

² As above



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				annual 50% capital expenditure write-off
35 MPa Delivered	No target	n.a.		
Stationary	Target Number³	Current Status	Partnerships, Strategic Approach	Support Mechanism
Small ⁴	No target	6.600 + 1.100 funding approvals		KfW programme 433 of the Ministry of Economy and Energy (BMWi), a combination of fix rate and performance-related subsidies
Medium ⁵	No target	n.a.		
Large ⁶	No target	n.a.		
District Grid ⁷	No target	n.a.		•
Regional Grid ⁸	No target	n.a.		
Telecom backup	No target	>300 units + 500 funding approvals		Subsidy for procurement (NIP II call)
H₂ Production	Target⁹	Current Status	Partnerships, Strategic Approach	Support Mechanism

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



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Fossil Fuels ¹⁰	No target	30 Mio. Nm ³ /d	• Fossil Fuels ¹¹	No target
Water Electrolysis ¹² (PEM, Alkaline, SOEC)	No target	>50 projects >55 MW electrolyser capacity installed As of Apr. 2019	Water Electrolysis ¹³ (PEM, Alkaline, SOEC)	No target
By-product H ₂	No target	4 Mio. Nm ³ /d	By-product H ₂	No target
Energy Storage from Renewables	Target¹⁴	Current Status	Partnership, Strategic Approach	Support Mechanism
Power to Power ¹⁵ Capacity	No target	n.a.		
Power to Gas ¹⁶ Capacity	No target	>50 projects		

¹⁰ Hydrogen produced by reforming processes

¹¹ Hydrogen produced by reforming processes

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

¹³ Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)

¹⁴ Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

¹⁵ Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

¹⁶ 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)