INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update June 2021: Germany

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

A total of 230 project outlines were submitted in Germany under the Hydrogen **IPCEI** (Important Project of Common European Interest) call from December 2020. Based on the comprehensive evaluation of the project outlines, 62 projects representing the entire value chain of the hydrogen market have been recommended for the EU match making process.

In the BMWi area, 50 project outlines were selected with a focus on generation, transport/pipelines and industrial applications. The Federal Ministry of Transport and digital infrastructure (BMVI) recommended 12 projects regarding the development and deployment of fuel cell (FC) systems and components as well as FC vehicles. Furthermore, BMVI supports a project to build a trans-European network of hydrogen refuelling stations (HRS).

The €8billion in state funding are made up of federal and state funds. Around €4.4billion come from the Federal Ministry of Economics; up to €1.4billion from the Federal Ministry of Transport. The remaining funding will be provided by the federal states. In total, investments of €33billion are to be triggered, of which more than €20billion will come from private investors.

Stakeholders of the submitting parties have prepared fact sheets and registered them in the EU portal. The IPCEIs strive to establish a complete European value chain by linking national projects across borders and thereby form an initial backbone of a European hydrogen economy.

In 2020 the **National Hydrogen Strategy** was published, and equipped with a budget of €7billion for national measures and €2billion for international measures. Of the latter, €900million will be available to support the first round of double auctions in the new **H2Global** platform. The idea of H2 Global is to support the initial build-up of large-scale green hydrogen production sites and export H2 to Germany (and Europe) by compensating the difference between hydrogen supply cost and the highest bidding price at the demand side. First supply side auctions are expected to start before the end of 2021.

2. Hydrogen and Fuel Cell R&D Update

On April 28th, 2021, the winners of the competition for the **Hydrogen Technology and Innovation Center** (ITZ) were announced by Federal Minister Andreas Scheuer. The concept ideas of three regions in Germany came out on top. In the first step, these regions will receive funding for a feasibility study. A joint feasibility study for a thematic cluster on aviation and shipping is being prepared for a further three locations (Stade, Bremen, Hamburg). The Center aims to give SME and start-up a supportive surrounding that is needed for innovative development.

3. Demonstration, Deployments, and Workforce Developments Update

By May 2021, 1195 fuel cell vehicles had been registered in Germany. For those FCEVs, 91 HRS are currently available and 15 more are under planning or construction. Out of these 91 stations with 700 bar refuelling, 6 stations have the option to refuel also at 350 bar. From 2021 onwards, stations will be built primarily where commercial vehicle (350 bar) demand is expected in the short term. In addition to the 51 fuel cell buses in operation, 28 more have been approved for funding. In the national strategic framework BMVI set the goal to build 400 HRS by 2025 and 1000 HRS 2030 depending on the ramp-up of vehicles.

Since 2016 stationary fuel cell CHP systems up to 5kW are supported (through the KfW433 programme). By end of March 2021 a total of 16,452 heating systems for domestic and commercial buildings have been granted public funding. For backup power systems, 558 units were approved for funding in addition to the installed more than 700 fuel cell systems. In the intra logistics sector, 93 fuel cell forklifts were in operation with an additional 242 approved for funding, some of which entering into operation at the submission of this update. Several fuel cell train projects were also approved for funding.

4. Events and Solicitations

In January 2021 the annually organised joint conference of the National Innovation Programme for Fuel Cell and Hydrogen Technology (NIP) General Assembly and the German Hydrogen Congress took place. With 4200 participants from all over the world the online event was a great success. The Congress provides an overview of the state of development of technology, products and projects while offering the opportunity to learn more about the strategic positioning of federal and state governments on the topic of hydrogen.

On 21st April 2021 a joint NOW&CEP (Clean Energy Partnership) heavy duty vehicle event took place online. The focus was on the different onboard storage options for hydrogen in heavy duty transport applications and the required standardization. A total of 929 participants from 22 countries registered for the event. A follow up event is currently being planned and information will be available on the NOW website or through the NOW newsletter.

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

The second phase of the National Innovation Programme for Fuel Cell and Hydrogen Technology (NIP II), in place since 2016, continued. In NIP II (since 2017) a total of €259million was approved for R&D projects, and a total of €285million for market activation. A brief overview of all projects of 2020 is given in the annual report of the NOW GmbH.

In February 2021, a guideline was published for the promotion of alternative drive systems in rail transport (also for hydrogen-powered trains). A separate budget (2021: €227million) is available for open technology funding. The first call for funding based on the new directive was published on 18 June (deadline for submission: 31 August 2021).

New funding guidelines for buses and trucks were awaiting notification of the EU Commission at the time of this update.

As part of the HyLand initiative an additional 65 expressions of interest to become a HyStarter region were received in May 2021, a call for HyExpert regions was open for submissions at the time of this update. The integration of hydrogen valleys has proven to be a very successful concept.

6. Regulations, Codes & Standards, and Safety Update

No RCS updates at this time. BMVI plans a project regarding hydrogen safety issues in mobility sector.

Summary Country Update June 2021: Germany

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles[1]		1195 (May 2021)		Subsidy for purchase for fleets (NIP II 3rd Call) incl. construction of refuelling infrastructure
FC Bus		51 (May 2021)	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 refuelling infrastructure. New funding guideline for deployment awaiting notification.
Fuel Cell Trucks[2]		1 (May 2021)		R&D activities of NIP. New funding guideline for deployment awaiting notification.
Forklifts		93 (May 2021) plus 242 approved for funding.	Industry Network Clean Intralogistics Net (CIN)	NIP market activation, additional procurement call
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
70 MPa On-Site Production	No target	n.a.		
70 MPa Delivered	100 by 2020 (basic network)	91 (May 2021) plus 15 in planning or	H2 Mobility, others	Subsidy for construction/ installation for publicly accessible stations for road transport

[1] Includes Fuel Cell Electric Vehicles with Range Extenders

[2] As above

		under construction		
35 MPa On-Site Production	No target	n.a.		
35 MPa Delivered	- 400 by 2025 (depending on vehicle roll-out, irrespective of dispenser pressure level) - 1000 by 2030 (depending on vehicle roll-out, irrespective of dispenser pressure level)	6 (May 2021)	H2 Mobility, others	Subsidy for construction/ installation for publicly accessible stations for road transport
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Small[4]	No target	16,452 units approved for funding (2016 to end March 2021)		KfW programme 433 of the Federal Ministry for Economic Affairs and Energy (BMWi), a combination of fix rate and capacity-related subsidies
Medium[5]	No target	n.a.		

[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)

Large[6]	No target	n.a.		
District Grid[7]	No target	n.a.		
Regional Grid[8]	No target	n.a.		
Telecom backup	No target	700 (May 2021)		Subsidy for procurement (NIP II call)
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Fossil Fuels[10]				
Water Electrolysis[11] (PEM, Alkaline, SOEC)	5 GW by 2030. Additional 5 GW by 2035-2040	38 MWel (42 projects) plus >2 GWel planned or proposed as part of IPCEI		Subsidy for procurement (NIP II call) specifically for mobility applications minimum size 250 kWel 7th energy research program by BMWi (applications for >300 MWel within “Reallabore” programme) HyLand Initiative by BMVI supports regional H2 production. Support through IPCEI currently in the European match-making phase.
By-product H_2				

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

Energy Storage from Renewables	Target[12]	Current Status	Partnership, Strategic Approach	Support Mechanism
Installed Electrolyser Capacity	As above	As above		As above
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)