INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update March 2024: Germany

Name	Marie Theres Bort
Contact Information	marietheres.bort@bmdv.bund.de
Covered Period	October 2023 – February 2024

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

The hydrogen import strategy announced within the update of Germany's National Hydrogen strategy in 2023 is currently under development and expected to be published by mid-2024.

The draft for the German Hydrogen Core Network (Kernnetz) comprises 9700km of transmission hydrogen pipelines. It connects industries, power plants with electrolysers, interconnectors and storage facilities. In May 2024, the Transmission System Operators will apply for formal approval by the regulator.

In February, Germany laid out the essential elements of a new Power Plant Strategy. The strategy foresees tenders for up to 10 GW hydrogen-ready gas-fired power plants, in which hydrogen from all production pathways shall be allowed. First tenders are expected in Q4 2024 and are aimed at projects which contribute to decarbonise the electricity system. The tenders will be supported with public funding of approximately €15-20 billion ($16.3-21.8 billion US). The strategy foresees a shift from natural gas to hydrogen use in the period 2035-2040; the exact date is to be determined in 2032. Currently, discussions with the European Commission about the essential elements of the Power Plant Strategy are being held.

In December 2023, Germany published its Strategy for Foreign Climate Policy. The strategy regards hydrogen as a central point of several activities and priorities.

2. Hydrogen and Fuel Cell R&D Update

The German Federal Ministry of Transport and Digital Infrastructure (BMDV) approved R&D funding over €73.4 million (approx. $79.9 million US) for 18 projects in late 2023. These projects include research for the following application areas: intralogistics, hydrogen supply, buses, ships, rail, aviation as well as components and systems.
The funding comprises two aviation projects that address major challenges for climate-neutral aviation. First, in the BALIS 2 project the companies H2Fly, Diehl Aerospace and German Aerospace Center are granted €10 million (approx. $10,9 million US) for development and ground testing of a hydrogen and fuel cell power train in the megawatt scale as a basis for a 40–80-person regional aircraft. Second, the WuE-FluB project includes several SME and research partners and aims at the development of a 3D-printed lightweight heat exchanger with a grant of €1.5 million (approx. $1.6 million US). The heat exchanger is a critical balance of plant component for the thermal management of a fuel cell system in aviation.

3. Demonstration, Deployments, and Workforce Developments Update

In February, 87 publicly funded 700-bar hydrogen filling stations (HRS) were in operation in Germany. A further 16 700-bar filling stations were under construction and 16 were being planned. Of the HRS in operation, 18 also had 350-bar refueling systems. A further 42 HRS for 350-bar refueling were under construction at the time and 19 were in the planning stage.

In February, construction work began at the combined gas-turbine cycle power plant of Heilbronn, owned by EnBW. The new CCGT plant is able to co-fire 20 percent hydrogen by design. The plant has an electrical rated capacity of 710 MW and a heat rated capacity of 190 MW.

In October 2023, Air Liquide and Siemens Energy officially inaugurated their joint venture gigawatt electrolyser factory in Berlin. The factory plans to ramp-up to an annual production capacity of 3 GW by 2025.

In July 2023, the first phase of the HH2E project started with the financial support of the Foresight Group. More recently, the project owner announced that an FID is expected to be made by mid-2025. The project encompasses a 500 MW AEL electrolyser, that can be scaled up to 1 GW, to become operational by 2030, flanked by 2 GW of battery capacity. The total production capacity is expected to reach 60,000 t/a of hydrogen.

In December 2023, ITM Power signed a capacity reservation agreement with Shell for future production for 100 MW of electrolyser stacks. The stacks are agreed to be produced in 2025 and 2026 for the Refhyne 2 project.

The hydrogen production project “Trailblazer” recently obtained an FID for a 20 MW PEM electrolyser, enabling the production of 2.9 t/a of hydrogen.

As of September, electrolysers with a cumulative capacity of 64 MW were installed across Germany. Current metrics both for Germany and Europe, including details on technology types, project phase, location, and project names, are available from the H2-compass website, funded by the BMWK and the German Federal Ministry for Education and Research (BMBF).

The Export Initiative Environmental Protection (EXI) is a funding programme financed by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) for the application of hydrogen and fuel cell technologies in decentralized energy supply. The progamme currently consists of four ongoing pilot projects (ECO-FCGen in India; GH2GH in Ghana; HygO in Namibia; HyTrA in South Africa), one completed feasibility study project (GJWHD in Jordan) as well as seven ongoing or completed potential analysis projects realised by the German Chambers of Commerce Abroad (Brazil; Chile; New Zealand/Pacific Islands; Nigeria; Philippines 1+2; Thailand). In 2023’s funding call, four further projects have been selected to officially start in the course of 2024. The funding call for 2024 is expected to open in June 2024.

4. Events and Solicitations

In December 2023, the H2 Regional Conference Rhine-Ruhr took place in Essen. The focus of this conference was on the two hydrogen implementation projects, H2 Steel and Trailblazer. Discussions revolved around the challenges and milestones of industrial transformation with hydrogen in the Ruhr region.

Between October 2023 and today, a number of official state visits to advance cooperation on hydrogen occurred in the Netherlands, Algeria, Tunisia and Norway.

In late October 2023, the first plenary session of the National Hydrogen Regions Association (Bund der Wasserstoffregionen -- BdWR) took place. With the BdWR, regional stakeholders are to be given a concentrated voice at the federal political level regarding their perspective of a hydrogen economy. The BdWR is composed of political representatives of German hydrogen regions, the VKU and DVGW associations and is coordinated by NOW GmbH. The focus of the first BdWR plenary session lay on the exchange of experiences regarding the main challenges in the implementation of regional hydrogen concepts. The second plenary session was held in late February 2024.

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

In February, the European Commission approved the first funding round of so-called "Carbon Contracts for Difference". This is a modern funding instrument which hedges transformative production facilities on the basis of a CO2 and energy hedging contract. The first funding round will auction a funding of up to €4 billion (approx. $4.4 billion US). The contracts will have a 15-year coverage period. The first funding round will start in Q1 2024.Three funding rounds will follow until the end of 2024, with a total envisioned funding volume in the range of mid double-digit billion euros.

In December of 2023, Germany announced that it would allocate €350 million (approx. $381 million US) to the domestic leg of European Hydrogen Bank pilot auction through its „auctions as a service" scheme. Germany's participation in the auction will help deliver on the National Hydrogen Strategy and provide an additional incentive for projects in Germany. The auction closed on 8 February 2024. The Commission (CINEA) is currently evaluating the bids.

In December 2023, the German Ministry for Economic Affairs and Climate Action (BMWK) provided the H2Global subsidiary HINT.CO with a grant notification for €3.53 billion (approx. $3.8 billion US). This budget forms the second funding round of the instrument and provides funding for the years 2026-2036. Adding up to the first funding round of 900 million (approx. $979.9 million US), the instrument's total budget amounts to €4.4 billion (approx. $4.8 billion US), so far. The results of the first auction are expected to be published in the second quarter of 2024.

In February, the European Commission approved an Hy2Infra IPCEI batch including 24 German projects, for a total public funding volume of €4.6 billion (approx. $5 billion US). Private investments of €3.4 billion (approx. $3.7 billion US) have been announced for said projects, of a total volume €8 billion (approx. $8.7 billion US). The projects mostly concern electrolysers, but also pipelines, storage, and terminals.

IPCEI steel projects were transferred to and notified under Climate Energy and Environmental Aid Guidelines (CEEAG). Germany granted a total funding for green hydrogen use in steel production in 2023 of €5.6 billion (approx. $6.1 billion US), the latest of which in December (Stahl-Holding-Saar, €2.6 billion [approx. $2.8 billion US]). Other major grants had been previously awarded to Salzgitter (€1 billion [approx. $1.1 billion US]) and Thyssenkrupp (€2 billion [approx. $2.1 billion US]). As of February 2024, the European Commission had approved a further grant of €1.3 billion (approx. $1.4 billion US) to be handed to Arcelor-Mittal from Germany.

An overview of the 86 funding programs surrounding hydrogen currently offered by the BMWK can be accessed here.

Developments of further funding opportunities mainly include the PtX Platform of the KfW Banking Group. It is mainly based on the PtX Development Fund of the Federal Ministry for Economic Cooperation and Development (BMZ). Information regarding the start of applications in 2023 can be retrieved here.

Besides that, BMWK substantially topped up the Green Hydrogen Fund at the European Investment Bank at the end of 2023. The fund will become operational by mid-2024. The funding includes investment grants and technical assistance to support green hydrogen and/or its derivative projects (production, transport, storage, and off-take). A dedicated partnership forum provides a platform for sharing experiences between key players in the green hydrogen finance area.

6. Regulations, Codes & Standards, and Safety Update

In January, draft legislation was published for the implementation of a guarantees of origin (GO) scheme for renewable gases, including hydrogen. The legislation is the national implementation of the European Renewable Energy Directive. The GO scheme will also cover low-carbon hydrogen from fossil fuels. Its purpose is to enhance consumer transparency and avoidance of double counting of environmental attributes.

In October 2023, Germany co-signed a declaration of mutual recognition of hydrogen certification mechanisms at COP 28.

The project “Standardization Roadmap Hydrogen Technologies" funded by the BMWK is continuing its works in several workstreams. Notably, in September 2023, the first comprehensive bundle of currently available technical rules and standards for hydrogen technologies was made publicly available. It comprises 919 documents and represents the current state of technical regulation in this field. The directory, which maps the complete value chain of the future hydrogen economy, can be accessed here. The first phase of the work planned within the roadmap, i.e. the collection of available documents, has been completed. The second phase, consisting of the identification of required action items, was almost finished as of February 2024. The third and final phase, i.e. the elaboration of publications and recommendations, is being prepared.