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# Factsheet: Germany's updated National Hydrogen Strategy (July 2023)

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Note: The information contained in this factsheet is based on translated extracts/summaries from the original document published in German by BMWK (26.07.2023). The authors assume no liability for the accuracy, completeness or timeliness of the information.

## 1. Background

**The 2020 National Hydrogen Strategy and the new 2023 update:**

- The 2020 National Hydrogen Strategy ("Nationale Wasserstoffstrategie", NWS) prescribes an evaluation and update after 3 years; also, an ambitious update of the strategy was part of the coalition agreement of the current Federal Government;
- The **NWS update was published on July 26, 2023** by Germany's Federal Ministry for Economic Affairs and Climate Action (BMWK);
- The strategy will continue to be developed in the coming years and adapted to the requirements as needed;
- Germany has made a legal commitment to achieve **climate neutrality by 2045**; to achieve this goal, the **supply of secure, sustainable and climate-neutral hydrogen is indispensable;**
- **Direct use of electricity for decarbonization** has lower conversion losses compared to hydrogen and should therefore be used where possible, if it is the most economical option;
- The NWS includes an industrial policy goal to become the "leading supplier" for hydrogen technologies along the entire value chain.

## 2. Hydrogen demand perspectives

- **Current demand: 55TWh** (mostly grey hydrogen in industry; could decrease through change in production or industrial transformation);
- Additional demand expected by 2030: 40-75 TWh;
- **Total Demand by 2030: 95-130 TWh** (hydrogen and its derivates together), of which **50-70% will have to be met by imports** from abroad in 2030 (45-90 TWh) → separate **Hydrogen Import Strategy** is being developed;
- Demand will increase drastically after 2030;
- Demand expectations for 2045: Industry sector: 290-440 TWh; Electricity sector: 80-100 TWh

## 3. Supply of hydrogen and its derivatives

### Key 2030 targets:

- **2030 domestic electrolysis** capacity target increased from 5 GW to **at least 10 GW**
- Establish diversified hydrogen supply, avoid new dependencies, establish sustainability standards, become technology partner for exporting countries.

### Key measures:

Domestic production:

- Green light for **IPCEI state support programs** for 2,5 GW electrolysis capacity in 2023 (short-term, 2023);
- Tendering of **500 MW of installed electrolysis capacity for the production of green system-serving hydrogen** annually between 2023 and 2028 (3 GW) (short-term, 2023);
- Through the **implementation of EU RED II**, investments in circa 2GW electrolysis capacity especially for the transport sector will be incentivized (short-term, 2023);
- New **funding guideline for offshore electrolysis (1 GW)** (medium term, 2024/2025);

Imports:

- Develop a **National Hydrogen Import Strategy** (short-term, 2023);
- Initiate additional projects within the framework of the **IPCEI Hydrogen** for the import of hydrogen from neighboring European countries (short-term, 2023);
- Continue and enhance existing government funding instruments (**H2Global**, **funding guideline for international hydrogen projects**, PtX platform with **PtX development fund H2Upp**) to cover the cost gap in the short and medium term. Regional forms of cooperation within H2Global (short-term, 2023);
- Devise accompanying measures for the market ramp-up in **international forums such as the IEA, IRENA, CEM/MI, IPHE and G7/20**, including "good governance" standards and the SDG at the G7 or G20 level (short-term, 2023);
- Strengthen European cooperation on non-European hydrogen imports through **European support instruments** like the European Hydrogen Bank, a joint purchasing platform or European CCfDs (medium-term, 2024/2025);
- Deepen and consolidate the hydrogen topic within the **climate and energy partnerships** or within strategic **hydrogen partnerships**, as well as to **establish new hydrogen partnerships** in order to secure the required imports and build cross-border hydrogen value chains (focus on realization of available green hydrogen export potentials and international flagship projects through appropriate instruments (e.g. funding instruments, political support) (medium-term, 2024/2025);

## 4. Hydrogen infrastructure

### Key 2030 targets:

- A so-called **hydrogen start network** ("Wasserstoffstartnetz") with more than 1,800 km of converted and newly built hydrogen pipelines will be built in Germany **by 2027/2028** via IPCEI („Important Project of Common European Interest") funding
- Approx. **4,500 km will be added across Europe** (via European Hydrogen Backbone)
- All major hydrogen production, import and storage centers in Germany will be connected to the relevant consumers by 2030.
- Hydrogen network will include sufficient hydrogen **pipelines** for intra-European transport, **hydrogen import terminals** on the German coasts by 2030 for imports via ship, hydrogen storage sites, and hydrogen refueling infrastructure for heavy duty transport (depending on the demand).

### Key measures:

National level:

- Proposal of German gas transmission system operators (FNB Gas) for a **hydrogen core network** to be built by 2032 and approval by the Federal Network Agency (BNetzA) (short-term, 2023);
- Changes to the **Energy Industry Act** (Energiewirtschaftsgesetz, EnWG) to build a regulatory framework for hydrogen grid (short-term, 2023);

- Development of a first integrated **gas and hydrogen network development plan** (medium-term, starting 2024/2025);
- The **System Development Strategy (SES)** (to be developed), considering also interactions with electricity, transportation and heating, will further support the development of the hydrogen networks (medium-term, starting 2024/2025)

European Hydrogen Backbone:

- Framework conditions as part of **EU hydrogen and decarbonised gas market package** (short-term, 2023);
- Rapid negotiations with partner countries on cross-border hydrogen pipeline projects (new and retrofitted), e.g., as part of EU **Projects of Common Interest (PCI)** (short-term, 2023);
- **Focus corridors**: North Sea and Baltic Sea areas, connections to Northern Africa (via France, Spain, Portugal (H2Med), or via Austria and Italy (SouthH2Corridor) (short-term, 2023);
- Dialogue with European partners on **joint cooperation projects**, e.g. offshore wind hubs, offshore electrolysis, long-term import contracts (medium-term, starting 2024/25)

Infrastructure for imports from third countries:

- Drafting of a **hydrogen acceleration act** to speed up construction of H2 terminals (short-term, 2023);
- All newly build **LNG terminals should be "H2-ready"** (i.e. convertible with little economic effort for the landing of hydrogen derivatives or transport media such as LOHC) (short-term, 2023);
- A **"National Harbor Strategy"** will be developed to ensure readiness of harbors for hydrogen imports via ship (short-term, 2023)
- The European H2 backbone must also include **strategic hydrogen pipelines to countries bordering the EU**, such as Norway, the United Kingdom, Ukraine, Morocco, Tunisia and Algeria (medium/ long-term, 2024-2030);
- **More import terminals for hydrogen or its derivatives only** are to be built (medium/ long-term, 2024-2030)

## 5. Hydrogen applications

### Key 2030 targets:

- Establishment of hydrogen applications in the following sectors:
  - **Industry, e.g. in the chemical and steel industries**, in particular;
  - **Transport**, for use in fuel cells or as a renewable fuel (especially in heavy-duty vehicles, aviation, shipping, military vehicles)
  - **Electricity**, for supply security (gas-fired power plants that can be converted to climate-neutral gases and system-serving electrolysers);
- In the **heating sector**, **no broad hydrogen application is expected by 2030**, although the conversion of gas distribution networks to hydrogen and the use of decentralised hydrogen boilers should also be made legally and technically possible.

### Key measures:

Industry:

- Government support programs started/ soon to be started (short-term, 2023):
  - "**Climate contracts for industry**" (support for additional costs (CAPEX and OPEX) incurred by companies in emission-intensive sectors due to the construction and operation of more climate-friendly plants compared to conventional plants; comparable to Carbon Contracts for Difference, CCfD);

- **IPCEI hydrogen funding**
- **Funding programme "Decarbonisation of Industry"**

Transport:

- Ambitious national **implementation of recently adopted mandatory EU quotas** for the use of renewable fuels of non-biogenic origin (RFNBOs) in transport (i.e. hydrogen and e-fuels (revision of REDII), power-to-liquid in jet fuels (ReFuelEU Aviation) (short-term, 2023);
- Active role in the **international development and harmonisation of standards** for the use of hydrogen and fuel cells (short-term, 2023);
- Support for **IPCEIs in transport**, covering the whole supply chain from the development of cell technologies to the development of vehicles (short-term, 2023);
- New **funding programme for the production of power-to-liquid fuels** in the transport sector to be announced (short-term, 2023);
- New national module under the **H2Global mechanism** to be launched for industrial **kerosene production based on power-to-liquid** (short-term, 2023);
- Revision of the **Eurovignette** Directive to incentivise hydrogen use in transport (short-term, 2023);
- Development of "**National Action Plan for Climate Friendly Shipping**" („Nationaler Aktionsplan klimafreundliche Schifffahrt") (medium-term, 2024/2025)

Electricity:

- Requirements for system friendly electrolysis are being examined as part of the System Development Strategy and the Climate-Neutral Electricity System Platform („Plattform Klimaneutrales Stromsystem")
- Auctions from 2023-2026 for 4.4 GW of so-called **hydrogen/ ammonia "sprinter power plants"** („Wasserstoff-Sprinter"-Kraftwerke) for the generation of electricity from hydrogen/ammonia with a total capacity of 4.4 GW
- Auctions from 2023-2028 for 4.4 GW of **renewable energy-hydrogen hybrid power plants** („EE-Wasserstoff-Hybridkraftwerke") that include local hydrogen production, storage and co-generation of electricity

Buildings/heating:

- Potential for waste heat utilisation from electrolysers should be considered in the siting of electrolysers, along with other variables such as RE electricity availability and electricity grid bottlenecks
- Criteria and implementation tools for examining a use of hydrogen in decentralised heat supply are being developed as part of Heat Planning Act (Wärmeplanungsgesetz)

## 6. Regulatory framework and government support

### Key 2030 targets:

- Creation of appropriate regulatory framework conditions, including **coherent legal provisions at national, European and, if possible, international level**, and harmonised standards and certification systems;
- Development of **sufficient administrative capacities** and coordination at all levels to ensure efficient planning and approval procedures of hydrogen projects;
- **CO2 pricing** as a guiding instrument, including effective **carbon leakage protection** is being continuously developed to improve investment security and incentives;
- **Financial support is limited to the production of green hydrogen** that is sustainable in the long term;
- In the **market ramp-up phase**, Germany will also **promote the use of low-carbon hydrogen** ("blue hydrogen" via SMR+CCS, "turquoise hydrogen" via methane pyrolysis, and "orange

hydrogen" from waste and residual materials) to a **limited extent and until sufficient green hydrogen is available**, considering ambitious GHG limits (based on EU regulations), including upstream chain emissions as well as maintaining the legal goal of climate neutrality

## Key measures:

- **Hydrogen Acceleration Act** to be presented (short-term, 2023);
- Approval procedures for hydrogen fueling stations will be simplified (short-term, 2023);
- Development of **clear requirements for the crediting of hydrogen** in the demand sectors, for example for promotion via Climate Change Contracts (CCfDs) or via quotas as in the transport and industrial sectors (short-term, 2023);
- Requirements from **EU REDII Delegated Acts to Article 27 and 28** are quickly implemented in national law (short-term, 2023);
- Germany supports the development of **uniform, practicable and ambitious criteria for especially blue hydrogen at EU level** (short-term, 2023);
- A national **Carbon Management Strategy** is currently being developed
- **Sustainability criteria**, including biodiversity, water and land use, and protection of human rights in supply chains, must be evaluated and considered as well as existing criteria (e.g. at H2Global) adapted if necessary (medium term, 2024/2025);
- Development of a **hydrogen technology and innovation roadmap**,
- Continue energy research program and develop new support systems

**Sources:**

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