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German hydrogen import strategy

Clean Hydrogen Trade Initiative, 30 May 2024

In July 2023, the National Hydrogen Strategy (NHS) was updated to accelerate the market ramp-up

June 2020

1st Phase: Start of the market ramp-up

September 2021

May 2022

July 2023

2nd Phase: Accelerated market ramp-up

Fields of action of the NHS update

1. Ensure availability of sufficient hydrogen
2. Expand hydrogen infrastructure
3. Establish hydrogen applications (industry, transport, electricity, heat)
4. Create an enabling policy environment

Source: Guidehouse, September 2023 based on BMWK 2023

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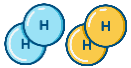
Which colours of hydrogen does Germany want?

The Federal Government‘s goal is to achieve a reliable supply for Germany of hydrogen which is green and sustainable on a long-term basis.

Direct financial support for hydrogen production is limited to the production of **green hydrogen.**



To ensure a rapid ramp-up of the hydrogen market, other colours of hydrogen will also be used, primarily **low-carbon hydrogen** from waste or natural gas in combination with Carbon Capture and Storage (CCS), until sufficient green hydrogen is available.

Promote the use of green hydrogen and low-carbon blue, **turquoise** and **orange hydrogen** to a limited extent on the application side.

Source: Guidehouse, September 2023, based on BMWK 2023, Icons by flaticon.com

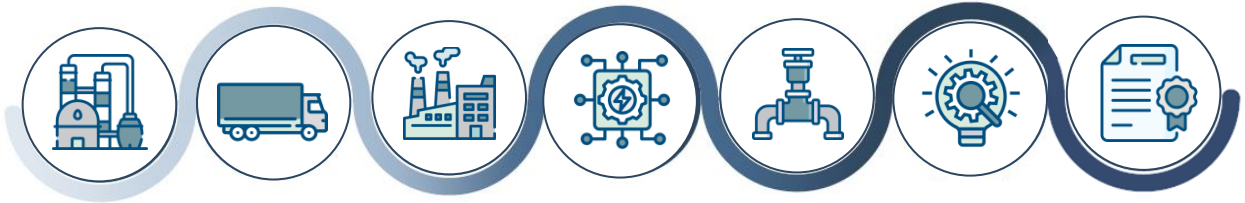
Germany's hydrogen strategy covers a number of sectors and fields of action

Hydrogen (H_2) production & imports
- 10 GW electrolyser capacity by 2030
- 45-90 TWh imported H2 by 2030

Industry
- Funding within IPCEI projects and Carbon Contracts for Difference

Infrastructure & supply
- Hydrogen flagship project Trans-HyDE
- European Hydrogen Backbone

Certification & approval
- Simplification and acceleration in H_2 generation, transport and infrastructure



Traffic
- H_2 applications stimulated in heavy vehicles
- E-fuels as an alternative with focus on maritime and aviation

Electricity & Heat
- Grid-bound H_2 as important energy storage and transport

Research, education and innovation
- Promotion of R&D and training of specialists
- Technology and innovation roadmap

Source: Guidehouse, September 2023 based on BMWK 2023; Icons from flaticon.com

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The ramp-up of a hydrogen core infrastructure network is crucial

National hydrogen infrastructure

Connecting future consumers with production and import locations, development of network planning beyond IPCEI, setting course for hydrogen storage

- Legal basis for hydrogen core infrastructure network
- Development of the first gas and hydrogen network development plan

European hydrogen backbone network

First expansion stage with a total of 4,500 km of pipelines (1,500 km new construction, 3,000 km by conversion of natural gas pipelines)

- Setting framework conditions for gas market and hydrogen issues in 2023
- Cooperation projects and the construction of cross-border infrastructures with MS

Infrastructure for imports from third countries

Accelerated development of convertible hydrogen-ready gas import terminals and sustainable shipping routes

- Introduction of measures for the ramp-up of import terminals
- Further new terminals for hydrogen and hydrogen derivatives are to be built

Source: Guidehouse, August 2023, based on BMWK 2023; Icons by flaticon.com

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Short-term measures (2023)
Medium-term measures (2024/2025)
Medium- and long-term measures (2024-2030)

Hydrogen applications are specifically promoted in industry and encouraged in transport

Industry

- Prioritising the replacement of fossil raw materials in applications
- Additional focus: hydrogen use for process heat (primary in steel and chemical industry)
- 2045 demand for H_2 in industry between 290 and 440 TWh

- Promotion within the framework of the IPCEI hydrogen and climate protection treaties
- Decarbonisation in Industry (DDI) funding programme
- Concept for creating demand for climate-friendly basic materials (green lead markets)

Transport

- In addition to e-mobility, H_2 is a central lever for emission reductions in transport
- E-fuels as an alternative (with focus on maritime, aviation)

- Implementing the sub-quotas for RFNBOs (RED III)
- Supporting and promoting IPCEI transport projects
- Establishment of the Hydrogen Innovation and Technology Centre (ITZ)

- Further development of funding programmes, incl. for tank infrastructure (NIP, IPCEI, Hy2Move)
- Overall strategy for the H_2 transformation of shipping

Source: Guidehouse, August 2023, based on BMWK 2023; Icons by flaticon.com

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Short-term measures (2023)

Medium-term measures (2024/2025)

Hydrogen is playing an important role in a climate-neutral electricity system

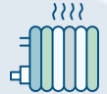
Electricity

Hydrogen including its derivatives like synthetic methane and ammonia is becoming an important long-term storage and transport option. The energy demand in conversion sector will increase to 80-100 TWh in 2045.

Planned tenders for so-called “hydrogen springer” power plants and for local “Renewable energy hydrogen hybrid” power plants

Examination of necessity of refinancing of controllable, climate-neutral hydrogen power plants on the basis of Platform Climate Neutral Electricity System (PKNS)

Heating



The use of hydrogen in decentralised heating generation will only play a subordinate role, as there are alternative options. Direct use of hydrogen is only envisaged after 2030.

Considering potential for waste heat utilisation from electrolysers in the siting of electrolysers, along with renewable electricity availability and electricity grid bottlenecks

Source: Guidehouse, August 2023, based on BMWK 2023; Icons from flaticon.com

Short-term measures (2023)

Medium-term measures (2024/2025)

Effective framework conditions are created for a strong hydrogen economy

Research, Innovation & Training

- Promoting research and technology development and researchers' networking
- Training and further education of skilled workers
- Continuation and further development of existing support programmes and flagship projects

- Technology and innovation roadmap
- Increased funding for hydrogen research and development projects
- Continuation & further development living labs for t energy transition
- Increase the attractiveness of energy-related professions

Sustainability standards & Certification

- Establishing ambitious and uniform sustainability standards and certification systems for hydrogen and its derivatives
- Promoting of international agreement on the mutual recognition of standards and certificates

- Develop clear specifications for hydrogen crediting in demand sectors, e.g., for promotion via Carbon Contracts for Difference
- Definition of sustainable carbon sources
- Develop an internationally recognised and methodology for hydrogen GHG footprints
- Evaluation of sustainability criteria

Source: Guidehouse, August 2023 based on BMWK 2023; Icons from flaticon.com

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Short-term measures (2023)
Medium-term measures (2024/2025)
Short- and medium-term measures (2023-2025)

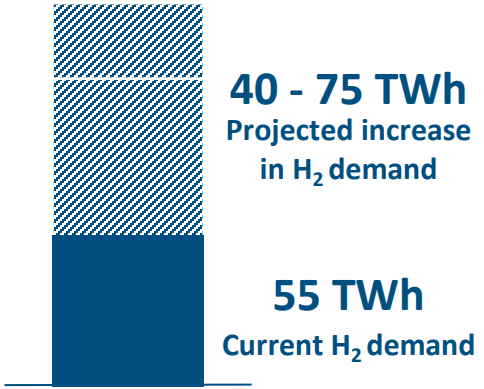
Germany's hydrogen (H_2) demand in 2030 will be 95-130 TWh

min. 10 GW

Domestic H_2 generation until 2030

45-90 TWh

Projected H_2 imports until 2030



95-130 TWh

Projected total H_2 demand in 2030

Source: Guidehouse, September 2023 based on BMWK 2023; Icons from flaticon.com

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German industry will be a major off-taker of green hydrogen by 2030

Important **heavy industry** stakeholders in Germany:

thyssenkrupp

ArcelorMittal

SALZGITTER AG Stahl und Technologie

Aurubis

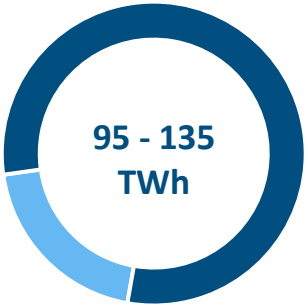
Important **chemical** industry stakeholders in Germany:

BASF We create chemistry

BAYER

covestro

German H_2 **demand by 2030**:



The steel industry expects a demand of 24 TWh hydrogen by 2030. This alone corresponds to **~20 %** of Germany's national hydrogen demand in 2030.

Source: Guidehouse 2023 based on Bundesregierung 2022

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Hydrogen is an important component of bilateral energy cooperation

- Canada
- USA
- Turkey
- Tunisia
- Algeria
- Morocco
- Brazil
- Namibia
- Chile
- South Africa
- Mexico
- Jordan

- China
- Kazakhstan
- Ukraine
- Japan
- South Korea
- Egypt
- United Arab Emirates
- Saudi Arabia
- Oman
- Australia
- New Zealand
- Qatar
- India
- Norway

Formalised hydrogen cooperation

Joint development of hydrogen projects

e.g. electrolyser projects, preparation of studies, regular exchange & assistance in the development of H2 strategies etc.

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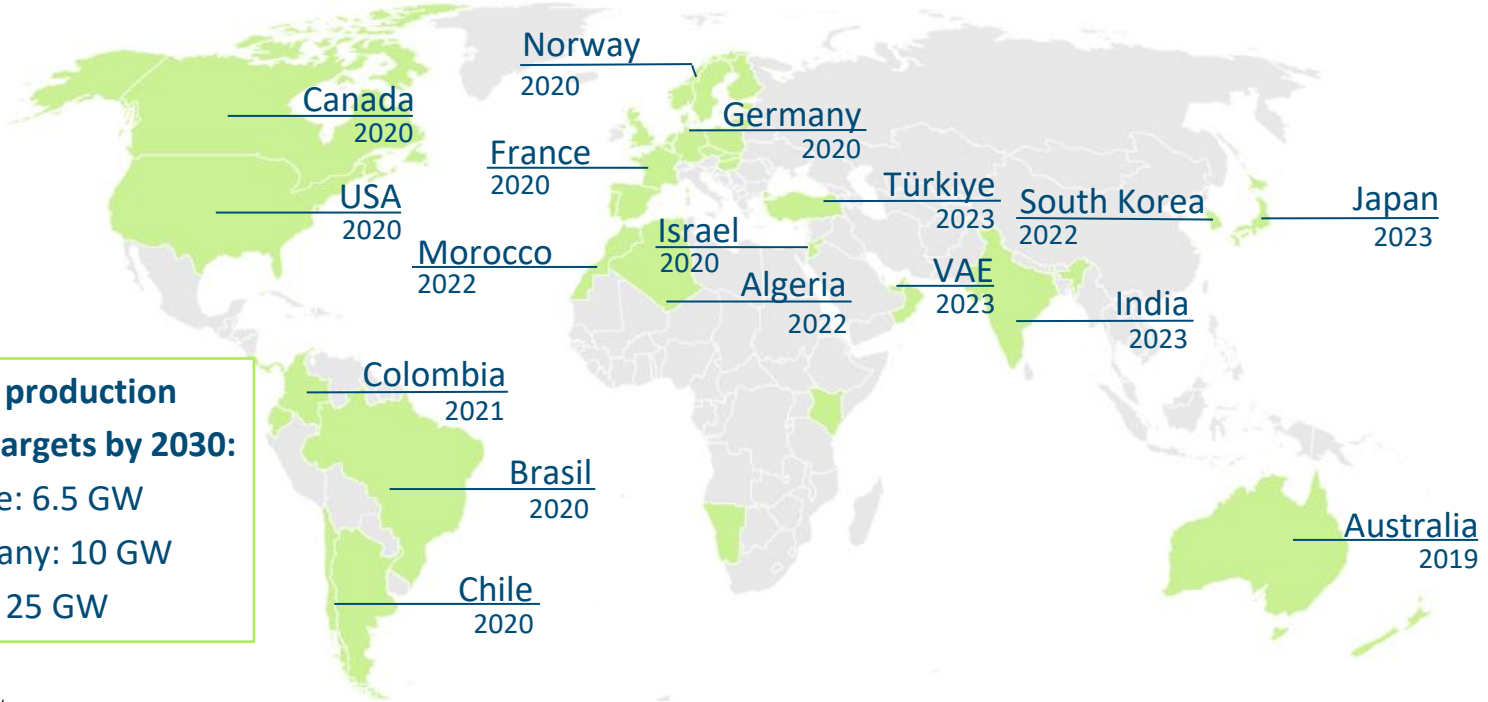
Guidehouse, February 2023 based on BMWK 2023

Increasing number of hydrogen strategies mirrors global interest



Green H2 production capacity targets by 2030:

- France: 6.5 GW
- Germany: 10 GW
- Chile: 25 GW

Source: Guidehouse October 2023 based on WEC 2021 & IEA 2023

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Germany provides targeted funding instruments to support green hydrogen projects worldwide

Germany's H2 funding schemes

- H2Global: Auction-based promotion of international green hydrogen projects
- **H2Uppp:** Provision of supporting services to small private-sector projects
- **PtX Development Fund**
- National **Funding Guideline** for bilateral hydrogen projects in non-EU countries
- **Individual project funding** (e.g., grants for projects in Saudi-Arabia and Chile in Dec. 2020)
- **Guarantee Instruments:** Promote foreign trade and investment

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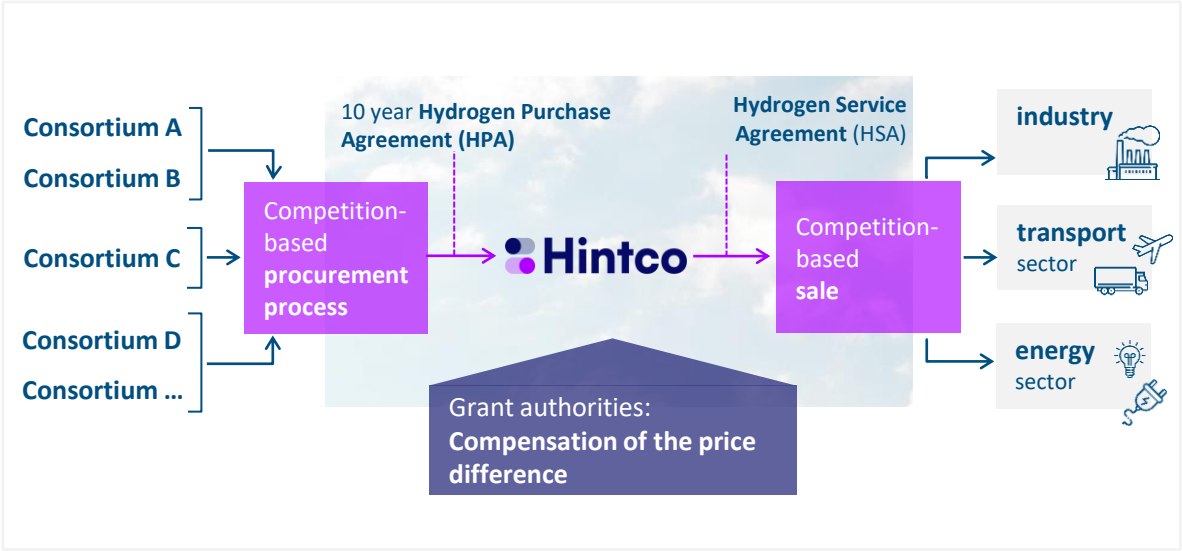
Source: Guidehouse, November 2023 based on BMWK 2022 & BMWK 2023; Icons by flaticon.com

H2Global will accelerate the timely and effective ramp-up of the PtX market

Long-term offtake agreements will help to actively promote a global hydrogen market



Hintco: Hydrogen Intermediary Network Company; implements auctions

Volume: €4.4bn (2024-2036), €900 million for first phase

Products: Ammonia, methanol power-based sustainable aviation fuels (SAF) for first phase

Timeframe: 10 years for HPAs

Source: Guidehouse, February 2023 based on BMWK 2021 & H2Global Stiftung, Icons: Flaticon.com

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Download the tender documents here:

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Thank you
for your attention!

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