Kickstarting the energy transition with hydrogen

GETH2 – Initiative for the implementation of a nationwide H2-infrastructure for Germany

Start for the Germany-wide hydrogen infrastructure

Germany has set itself the target of reducing CO2 emissions by 80-95 percent (compared to 1990). In order to achieve the climate targets with the greatest possible efficiency, other key technologies are needed in addition to the expansion of renewable energy generation and the electricity infrastructure. The conversion of electricity from renewables to hydrogen (H2) - power-to-gas - is such a key to a successful energy transition.

The principle

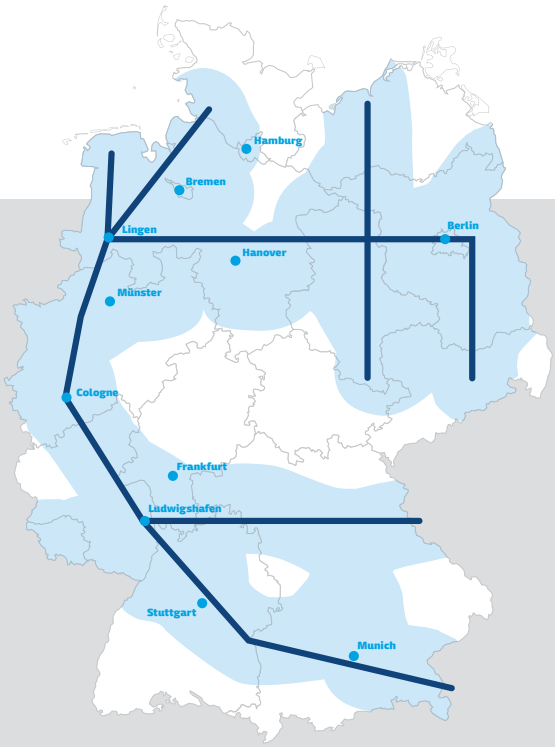
→ Electricity from renewable energies is converted to H2

→ The green H2 is distributed via the existing gas infrastructure

→ In the industrial, transport, energy and heating sectors, green H2 is used as a CO2-free energy source

→ H2 that is not used directly is stored in underground caverns especially for dark doldrums

GET H2 connects regions with a high proportion of renewable energies from wind and solar energy with H2 production at an industrial scale. In addition, GET H2 is working on the development of a nationwide H2 infrastructure with a view to linking all sectors and making the best possible use of existing infrastructure for gas transport and storage as well as the electricity grid. In this way, we also solve the problem of supplying renewable energies for dark doldrums and in the winter months.



Over 90 % industry and population accessible

Simplified draft of a Germany-wide H2 infrastructure using existing gas infrastructures. Around 90 % of the population is reached efficiently for mobility applications. Sites of refineries and ironworks as well as the chemical industry as future major consumers of H2 are also considered.

Green H2 - basis for the energy transition

H2 from renewable energies will become a complementary technology in addition to electricity as part of an overall optimization of the energy system:

- → Emission-free in the local application
- → Renewably produced
- → Can be transported, stored and handled safely
- → Flexible use, also admixture to natural gas is possible within defined limits
- → Contribution to the achievement of climate targets in the steel and chemical industries
- → Basis to produce e-fuels, in particular for cars, aircraft and ships
- → Minimal use of space, high level of acceptance

The focus is on the use of renewable gases that can be used in the coupled sectors and their decarbonization effect. The grid-assistive use of PtG systems is an important, possible additional benefit. After a market launch phase, the market should decide what overall contribution the H2 technology can make to a decarbonized energy supply.

Necessary political support for green H2

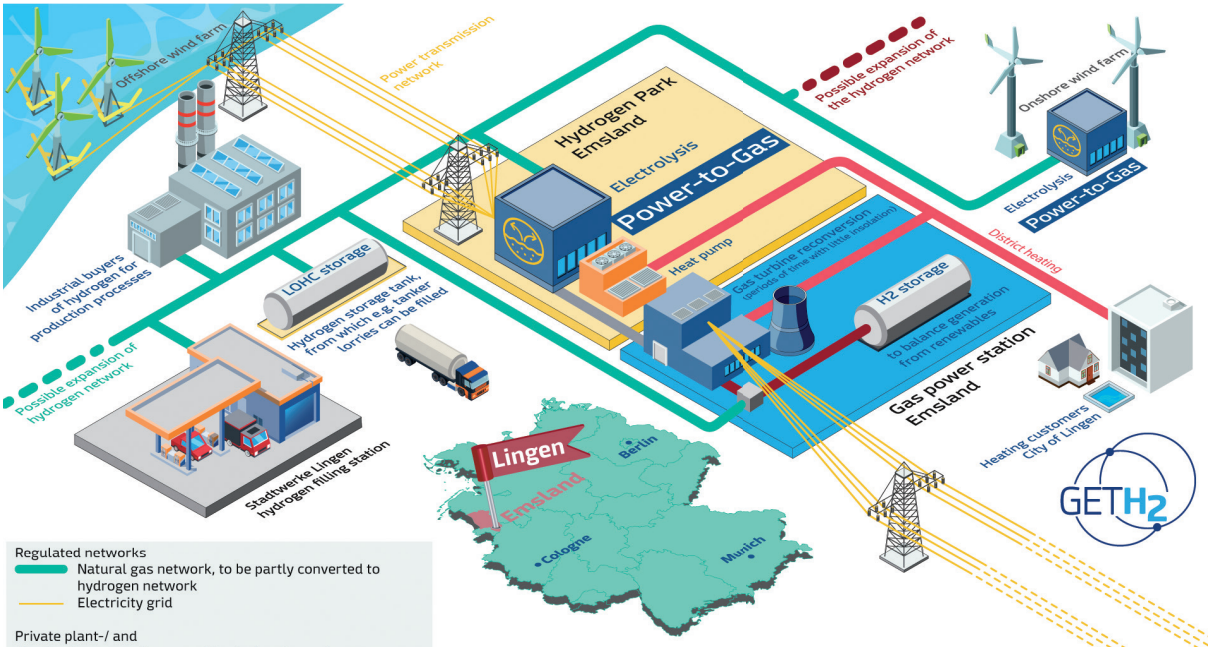
The market launch of green H2, the establishment of an H2 infrastructure, the realization of the advantages of PtG technology, the establishment of a new economic sector - we can achieve all this with the support of a comprehensive package of measures:

- → Adaptation of the tax and levy system to sector coupling requirements
- → Maintaining or expanding incentives for green H2 technologies and their use
- → Consistent consideration of H2 in EnWG, directives and gas market regulations
- → Implementation of tradable guarantees of origin that provide information on the decarbonization contribution of H2 and can be offset against CO2 reduction targets - preferably CertifHy
- → Supplement of the technical rules and regulations (DVGW) for pure H2 infrastructure
- → Supplementing the Gas Network Development Plan for the transparent development of H2 infrastructure

Kickoff: GETH2 in the Emsland

The nucleus of the H2 infrastructure of Germany is the GET H2 project. In Lingen in the Emsland region, all elements of the production, storage, use and transport of green H2 are combined on an industrial scale, initially with a focus on mobility and large-scale industrial consumers:

- → Electricity from renewable sources
- → Power-to-Gas plants (electrolysis) to produce green H2
- → Existing electricity and gas infrastructure incl. gas storage facilities
- → High temperature heat pump for the use of electrolysis waste heat
- → Gas turbine for H2 re-electrification in times of dark doldrums
- → LOHC (Liquid Organic Hydrogen Carrier) storage and transport system for decentralized distribution of green H2



GET H2 project partners

ENERTRAG – Eine Energie voraus
JÜLICH Forschungszentrum
hydrogenious Technologies
RWE
SIEMENS – Ingenuity for life
IKEM
Wir transportieren Gas. nowega
STADTWERK LINGEN

Further associated partners from all areas actively support the initiative: www.get-h2.de/en/partners