



Services along the hydrogen value chain

Distribution/transport:

Refuelling stations/ filling systems

H₂ competence @ HydroHub

Our services run along the entire value chain in the hydrogen industry – from generation through transport and storage to use in various fields of application.

Energy generation

Renewables
(e.g. wind, solar)

Conventional power plants

Geothermal

H₂ generation

Electrolysis
Seawater
desalination plants

Reforming processes

Methane pyrolysis

Distribution/transport

Electrical grid
Pipelines
District heating

Intelligent networks
Refuelling stations/
filling systems

Tankers
(lorry, train, ship)

Storage

Battery storage
Gas tanks

Cavern storage
(H₂ and CO₂)

Pressure vessels
H₂ hydride storage

Consumption/use

Fuel cell system
Methanol synthesis unit

Carbon capture and utilisation
Mobility (e.g. e-fuels)
Reconversion to electricity

Power to gas (gas, heat, liquid)
Industrial applications
(e.g. refinery)

H₂ competence @ HydroHub

We give comprehensive support to hydrogen projects and offer a broad spectrum of services in the concept/planning, production, operation and decommissioning/disposal phases.



Concept/planning

We support you from the start with research and project planning measures and specific tasks. Already at the conception phase, we are there at your side with feasibility studies, strategic and financial consultation and a broad range of organisational and technical services. Alongside concept creation with consideration for legal, technical and economic conditions, we take on the task of analysing the requirements and support you in the process of determining feasibility through basic and design planning all the way to the approval process.



Production

For over 150 years, it has been one of our tasks to analyse and manage technical sources of risk. With our wide range of specific services, we are thus able to offer you competent help in the integration of hydrogen technologies into the industrial value chain. Our range of services runs from fact-finding and construction through project management, administering documentation and operator's obligations, basic and detailed process engineering all the way to project support through geological, environmental and engineering services during the production process.



Operation

We support frictionless operation with our extensive range of services and our primary goal of optimising operational reliability and preventing damage. Our services support you in the implementation of your operating strategies and in the accompanying optimisation, maintenance and upkeep concepts. Our safety-oriented process with operational monitoring and the creation of damage-limitation concepts contributes, in the final account, to establishing hydrogen in the popular conception as a safe and controllable technology.



Decommissioning/disposal

Just as we are there for you in the first concept phase, we are also at your side at the decommissioning phase, providing all the required services for dismantling and disposal – including project management and comprehensive services to handle your operational obligations. We create concepts to the current legal requirements, standards and regulations and support you in identifying, analysing and avoiding the potential risks of your intervention.

Refuelling stations and filling systems for hydrogen

Hydrogen refuelling for road and rail vehicles takes place at refuelling stations allowing fuel to be supplied at various levels of pressure. Alongside stationary hydrogen refuelling stations there are also mobile ones. Of importance here is the storage and compression technology which is selected depending on the initial condition of the hydrogen (liquid or gaseous) and the number and type of vehicles to be filled. A particular challenge for the sealing technology of refuelling systems is also posed by the high pressure.

We are your partner for the energy transition in the mobility sector – particularly with regard to the development of national hydrogen refuelling station networks and the setup and safe operation of refuelling stations and filling systems for hydrogen. With the most modern analytical methods, measurement processes and competent specialists, we are at your side to carry out your project safely and successfully, and to help you benefit from subsidies as available. Do get in touch.



Refuelling stations for gaseous hydrogen

With the development of a hydrogen infrastructure, Germany will see the establishment of a network of fixed hydrogen refuelling stations allowing for road vehicles to be supplied with gaseous hydrogen. There will also be small facilities e.g. for refuelling fuel cell-powered forklifts, mobile refuelling stations for specific local needs and refuelling stations for fuel cell-powered trains. Most refuelling stations will be supplied with hydrogen by tanker but some will have electrolyzers to produce hydrogen on site.

Gaseous hydrogen is stored at refuelling stations in tanks of pressure vessels, overground tanks or underground tubes. For refuelling, compressors reduce the volume of the hydrogen by compressing it to the required level. Currently, most hydrogen refuelling stations are designed to fill a car in around 3 minutes at 700 bar. Refuelling

stations with suitably sized compressors can also supply commercial vehicles with 700 bar. To refuel hydrogen buses and cars, refuelling stations need a 350 bar pump, while the vessels on board trains are filled at 250 bar.

An important role in the process is also played by thermal management. Hydrogen for gaseous refuelling is brought to a temperature of -40°C . When it is stored as a gas, this is achieved by cooling devices; if stored liquid, a cryopump is used to warm the hydrogen stored at -253°C .

Refuelling stations for liquid hydrogen

While the storage and transportation of liquid hydrogen has long been standard practice, its use as an energy medium in vehicles is still the subject of research. After initial trials with liquid hydrogen-powered cars, lorries are now the key focus for vehicle development and the adaptation of petrol stations. Here, filling processes are being tested that avoid the boil-off effect of gaseous refuelling and also do not require complex data communication between the refuelling station and vehicle.

The liquid hydrogen, much colder than its gaseous phase, requires much better insulation of pressure vessels and pipes, but also allows for refuelling at low pressure thanks to its higher energy density and the use of smaller, lighter tanks that still achieve the same range. After the setup of initial pilot stations for refuelling with liquid hydrogen and a successful test phase, liquid hydrogen technology could thus also contribute to the decarbonisation of road transport, particularly long-distance lorry transport.



Our services

We will support you from the start in considering the background legal and technical conditions and will guarantee the plant gets safely up and running. To this end, we offer you comprehensive services in the fields of consulting, engineering and training – in the following phases of the project at hand:

	Concept/ Planning	Production	Operation	Decommissioning/ Disposal
Creation of concepts to current legal requirements, standards and regulations	●			
Appointment of company officers: immission protection, accidents and hazardous materials			●	



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