



Services along the hydrogen value chain

**Distribution/transport:**

# Intelligent networks



HydroHub

# H<sub>2</sub> 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

## H<sub>2</sub> 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  
(H<sub>2</sub> and CO<sub>2</sub>)

Pressure vessels  
H<sub>2</sub> 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)

# H<sub>2</sub> 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.

# Intelligent networks – much more than just power lines

Taking the step from fossil, highly available energy media to volatile renewables requires new flexibility in our energy infrastructure and more interlinking of its components. Information and communication technologies play a central role here, with so-called “smart grids” taking on the communicative integration of all actors in the system – from generation through transport, storage and distribution to consumption by the industrial and private sectors. Modern measurement systems and controls allow extensive automated adjustment, contributing to releasing some of the burden on the grid, reducing costs during peak load times and maintaining security of supply.

We are your partner for the implementation of the energy transition on the grid – particularly with a view to cross-sectoral solutions to integrate various producers and with regard for the safety, resilience and operational efficiency of systems. We are at your side with the most modern technologies and competent specialists to execute grid extension projects successfully and let you benefit from subsidies. Do get in touch.



# Smart grid pilot projects

The use of information and communication technologies in the energy sector has been successfully researched and tested in Germany for several years now. State subsidy, legal frameworks and standardisation have laid the founda-

tions today for the development of model regions in which a high portion of electricity from wind and solar power plants, alongside hydrogen, contributes to a secure grid.

## H<sub>2</sub> project SmartQuart Kaisersesch

To drive forward the transition to decentralised energy and heating at the district level, the HydroHub is supporting the H<sub>2</sub> project SmartQuart Kaisersesch from development through to approval and operation. Along the entire value chain of renewable energy in the heating, electricity, mobility and industrial sectors, the project makes it clear how the development of a hydrogen infrastructure can be combined with the use of further energy media, leading in the end to the systemic integration of many individual solutions to form a networked whole.





The knowledge gathered through practical experience will serve as a blueprint for the development of comparable modular solutions in which intelligent networks communicate via a digital platform. Thus, SmartQuart Kaisersesch serves as a real-life laboratory for sector coupling where new energy-optimised concepts are developed for future use in new-built or converted residential areas and as part of sustainable energy planning for cities.

# Our services

We support commercial and municipal actors in developing smart grids for the cross-sectoral use of renewable energies. We enable the integration of information and communication technologies and intelligent systems for grid control and automation by providing comprehensive services in the fields of testing, inspection and certification – in the following phases of the project in question:

	Concept/ Planning	Production	Operation	Decommissioning/ Disposal
Creation of concepts to current legal requirements, standards and regulations	•			•
Creating requirements specifications	•			•
Creating technical specifications	•			•
Creating commissioning and periodic inspection concepts	•			
Weak-point analysis, identification and analysis of potential risks	•			•
Creation, consultation on staggered power system protection plans, protection tests	•			•
Conception and consultation (commissioning, periodic inspection) of isolated networks including the incorporation of e.g. decentralised generator units, electrolyzers and any necessary storage facilities (on and offshore)	•			
Creation of risk analyses to determine the potential risk of intervention	•			•
Creation of risk analysis and hazard assessments	•			•
Creation of safeguarding concepts	•			•
Consultation, evaluation of electrical and mechanical safeguarding systems	•			•
Consultation, evaluation on installation and operation of alarm receiving stations	•			•



	 Concept/ Planning	 Production	 Operation	 Decommissioning/ Disposal
Consultation, evaluation on determination of intervention measures by guarding/security company or police	•			•
Consultation, evaluation on determination of administrative security measures	•			•
Technical advisory services	•			
Project management and document administration	•	•	•	•
Electrical charging columns, construction support, risk assessment; grid analysis with a regard to fault-free operation	•	•	•	
Damage assessments and analyses of the causes of damage, creation of avoidance concepts			•	
Analysis and evaluation of damages and measures to prevent comparable faults			•	
Maintenance of breakdown statistics to assess operational reliability in comparable plants/components			•	
Analysis of electrical grids: e.g. short circuit, load flow calculations, efficiency and optimisation assessments			•	



## HydroHub

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