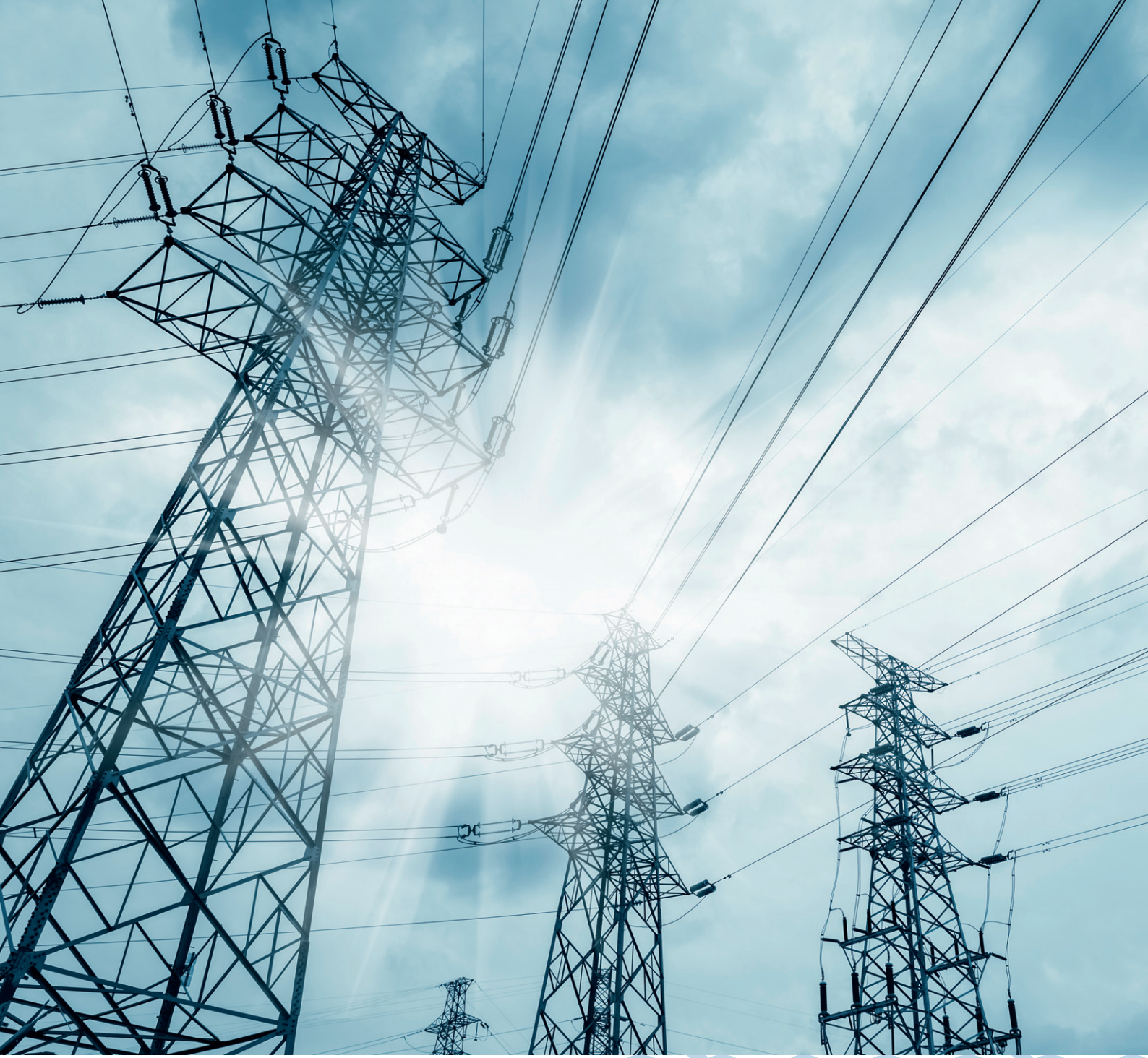

Services along the hydrogen value chain

Distribution/transport:

Electrical grid

HydroHub

H_2 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_2 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_2 and CO_2)

Pressure vessels

H_2 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_2 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.

Integrating renewables securely into the electrical grid

The electrical grid makes a central contribution to achieving the goals of climate policy connected with the intended decarbonisation and development of decentralised generation structures. Starting from a mid- to long-term increase in gross electricity consumption to around 650 to 700 TWh in 2035 and 704 TWh in 2040, the Federal Network Agency's grid development plan shows in various potential scenarios what measures are necessary to optimise, strengthen and extend the German electrical grid.

The goal of the plan is the secure integration and distribution of electricity from renewable sources into the German transport network, while at the same time ensuring Germany retains its leading position in grid stability. Particular attention is to be given here to sector coupling and the grid orientation, with topics such as plant allocation, bottleneck avoidance and the development of regulatory framework conditions and incentives coming to the fore.

We are your experienced partner for the conception, planning, approval, operation, maintenance and in particular the optimisation, reinforcement and further development of the transmission grid – from measures to strengthen the direct current network and projects in the alternating current sphere to laying routes and utilising offshore potential. With competent specialists and the most modern analysis and measurement methods, we are there for you to carry out feasibility studies, support your project from planning and approval through construction to operational optimisation and let you benefit from subsidies. Do get in touch.

The electrical grid in flux – moving towards a decentralised generation structure

The energy transition is placing wholly new demands on the grid. Existing large-scale power plants, usually located in the vicinity of centres of consumption, are gradually being replaced by many smaller, decentralised facilities to generate renewable energy. Wind power and solar power are intended to deliver around 65% of the electricity generated in Germany by 2040. The allocation of the plants and their feed into the grid is thus determined above all by the potential hours of wind and sun available. Alongside strong development of offshore wind, land-based wind farms are being set up, especially in the north and east of Germany. In terms of solar, ground-mounted plants will be set up preferentially in east and south-east Germany, with south Germany offering the best conditions for building-mounted plants.

The challenge of volatile electricity generation

Because of the decentralised generation structure, the electrical grid faces the challenge of accepting regional overproduction and transporting it to where consumers have previously been supplied by large-scale power plants. As many lines are already at the limit of their capabilities, the development of the grid is being accorded high priority, working to the NOVA principle (network optimisation and reinforcement before extension). Therefore, in the first stage, optimisation measures such as the deployment of storage facilities and controllable local grid transformers, the development of border coupling points and of demand management can help to adapt the infrastructure of the transmission and distribution network in a cost-effective way and guarantee grid stability.

Infrastructure corridors and underground cabling

During the grid development, the plans for the creation of large-scale routes from north and east Germany to south Germany will take place. Here, high-voltage direct current is to be transmitted, where according to the Federal Requirements Planning Law (BBPIG) underground cables are to be preferred to keep disturbance to the landscape to a minimum and achieve the greatest possible acceptance of the measures among the populace.

As the transmission of high-voltage electricity has previously taken place almost exclusively via overhead lines and underground cables are largely used at the medium and low-voltage ranges for distribution networks, the operators of transmission systems are now faced by the challenge of developing cable technologies and laying processes allowing for the secure transmission of high voltages across long distances below the surface of the soil.

Our services

Whether it's reinforcing or optimising existing plants, trying out innovative processes or executing complex construction work, with comprehensive services in the fields of consulting, engineering and training, we support industrial, institutional and academic actors 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, electrolysers 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 on and 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, certification, construction support, risk assessment; grid analysis with a regard to fault-free operation	●	●	●	
Route engineering: feasibility studies, design, approval and execution planning, planning and calculation of special buildings, valve stations, creation of tendering documents, collaboration on awarding tender, site management, construction monitoring, planning and support for pigging, pipeline accounting	●	●		
Acquiring rights: land acquisition, acquisition of private easements, planning permission, access rights, repurposing of pipelines, crossing request management, authority management, construction rights of way, damage compensation on the route	●			
Geotechnical/foundation engineering subsoil assessments, field and lab tests of soil mechanics, excavation plans, soil science support, compaction tests	●	●	●	
Hydrogeology: water table drawdowns, groundwater usage, hydrogeological investigations, requests for water rights, company officer for the water authorities	●	●	●	
Environmental technology: hazardous material assessments, contaminated site investigation and cleanup planning, renaturation planning, inspections of heaped aggregates, risk assessment under BBodSchV, waste evaluation and declaration, initial condition reports, A+S plans	●	●	●	
Geoinformation: CAD-GIS treatment, 3D modelling, database and app development, data and structural analyses, programming, BIM	●	●	●	

	Concept/ Planning	Production	Operation	Decommissioning/ Disposal
Engineering surveys: route measurement, construction and inventory surveying, control surveying, 3D laser scanning and tracking, pipe location, 3D ground radar	●	●		
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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