Services along the hydrogen value chain

Storage:

Battery storage

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.

Battery storage – critical for the success of the energy and transport transition

The development of renewable energy generation demands a never-before-seen flexibility in the centralised architecture of the electricity sector. As renewable energy does not flow constantly, measures are needed to make production overhangs usable and ensure time- and weather-independent electricity supplies. Here, stationary battery storage is taking on an ever more important role. With scalable capacity and intelligent control, it is able, say, to redistribute loads, shave load peaks and to temporarily compensate for grid faults such as power plant shutdowns. In the development of mobility solutions for tomorrow, mobile battery storage is taking on a central role. Competing with fuel cell technology, but also in combination with it, pioneering drive concepts are being created with diverse opportunities for use.

We are your partner for battery-supported mobility, to make use of excess capacities in the generation of renewable energy and to ensure the grid-regulating integration of photovoltaic and wind-generated electricity. With the most modern analytical methods and competent experts, we are at your side, helping you safely plan high-performance battery storage facilities, operate them successfully and benefit from subsidies as available. Do get in touch.

Rechargeable battery technologies

Like in consumer electronics and e-mobility, lithium-ion batteries are gaining a globally leading position in the stationary battery storage market too. With a market share of two thirds, these storage technologies provide the most common and high-performance technology for battery storage plants.

The remaining third of the market is occupied by lead, sodium-sulphur and sodium-nickel chloride batteries, redox flow cells and nickel-cadmium batteries.

Performance

While in Europe, relatively small plants with storage capacities in the one- to two-figure MWh range are used for industrial purposes, usually in conjunction with solar plants and wind farms, Australia and the USA already have plants in the three- to four-figure range. Because of the modularity of battery storage plants, their storage capacity can be very easily extended, meaning that their capacity could soon match the level of large pumped storage plants, whose scalability is limited and very expensive.

A characteristic advantage of battery storage is its cold start-up ability, with short control and start times in the millisecond range, meaning they can have a stabilising effect on the system. Further potential exists in their integration in virtual power plants (VPPs). The pooling of several decentralised battery storage facilities and their management and intelligent control opens up new possibilities for energy companies in day-ahead and intraday trading on the balancing market.

Areas of use and usage

Battery storage offers scalable complete solutions for reliable electricity supply – at any time or place, on industrial levels and in the home.

LARGE-SCALE BATTERY STORAGE

Potential areas of use:

- Energy-intensive industry and agriculture
- Municipal utilities
- Energy producers (wind, solar)
- Grid operators
- Car dealerships and commercial operations with e-charging stations

Examples of use:

- Storage of excess production capacities
- Reduction of load peaks (peak shaving)
- Covering peak loads in the minute range
- Management of consumption fees
- Optimisation of the level of self-sufficient supply
- Increasing grid stability
- Ensuring the necessary quality and flexibility in electrical grids
- Power-as-a-service concepts

SMALL BATTERY STORAGE

Potential areas of use:

- Data centres, telecommunications providers
- Private households
- E-mobility

Examples of use:

- Uninterruptible power supply
- Storage of excess energy from solar plants
- Driving electric, hybrid and hydrogen vehicles

Our services

We will support you from the start in considering the background legal and technical conditions and will be there for you to create risk analyses and safeguarding concepts all the way to managing the project. To this end, we offer you comprehensive services in the fields of consulting, engineering and training – in all phases of the project at hand:

	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, evaluation on installation and operation of alarm receiving stations	●			●
Consultation, evaluation on determination of intervention measures by guarding/security company or police	●			●

	Concept/ Planning	Production	Operation	Decommissioning/ Disposal
Consultation, evaluation on determination of administrative security measures	●			●
Technical advisory services	●			
Project management and document administration	●	●	●	●
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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