
Services along the hydrogen value chain

Energy generation:

Wind energy



TÜV®



TÜV NORD GROUP

H₂ competence @ TÜV NORD

1. Energy generation

Wind energy ■■■

2. H₂ generation

Electrolysis ■■■

Seawater desalination plants ■■■

3. Distribution/transport

Electrical grid ■■■

Pipelines ■■■

District heating ■■■

Intelligent networks ■■■

Pipelines ■■

Refuelling stations/
filling systems ■

Tankers (lorry, ■
train, ship)

4. Storage

Battery storage ■■■

Gas tanks ■■■

Cavern storage ■■■
(H₂ and CO₂)

Pressure vessels ■■■

H₂ hybrid storage ■

5. Consumption/use

Fuel cell systems ■■■

Methanol synthesis ■■■
units

Refinery ■■■

Mobility ■■

In every field of services, we support you in the following phases:

■ Concept/planning

■ Production

■ Operation



Concept/planning

We support you in the concept phase with comprehensive services that will give your project the security it needs in technical and legal aspects from the very start. From product design through the assessment of requirements and technical specifications to plant development and process optimisation, our specialists have the details and the desired goal in view and are equipped and prepared for your tasks with ultra-modern IT and AI instruments as well as a broad spectrum of risk analysis, certification, test and evaluation services.



Production

With specific testing, auditing and approval services, we provide neutral and technically competent support as a notified and accredited body for manufacturers. This includes assessment and certification as a material manufacturer, obligatory for the production of certain products. Our range of services also includes the assessment of manufacturing processes, material assessments, stress tests, damage appraisal and product certifications. In addition, on top of monitoring production, we also support commissioning, assembly works and personnel instruction in production processes.



Operation

After setup and commissioning, we help you when operations are up and running to avoid shutdowns, eliminate technical sources of danger and reduce costs with the use of software-supported maintenance systems. We take on the task of carrying out all recurring inspections and specific tests of electrical and mechanical plants and systems. We can also create risk-based maintenance plans and provide you with tailor-made strategies to reduce operational risks and increase plant safety over the long term.

Wind energy: global growth and perspectives for offshore

Wind energy's expansion is moving on apace across the world, with the majority of farms being built on dry land and many locations with favourable wind conditions and infrastructural connection opportunities available for connection.

In comparison with this, the offshore sector appears insignificant, making up only 4.5 % of all wind power plants (as of the end of 2019). New offshore facilities, however, today offer much greater power capacity. Considering the potential wind to be harnessed and the sizes of plants that could be realised, their efficiency and social acceptance, offshore wind could grow even more strongly in the years to come. In Germany, incentives such as the Offshore Wind Energy Act contribute to this, last amended in 2020.

As part of Germany's National Hydrogen Strategy, projects can also be subsidised that

use wind energy in a cross-sectoral way, say, in climate-neutral energy supply to districts. By using wind electricity to produce green hydrogen, companies in, say, the steel and cement industries can reduce their CO₂ emissions, while refineries can lay the foundations for the production of synthetic fuels. In addition, wind farm operators can become hydrogen producers themselves. Innovative concepts are currently investigating the production of green hydrogen at sea, right in the offshore wind farm.

We are your experienced partner for the use of wind energy on land and sea, particularly with a view to designing innovative hydrogen process chains. With competent specialists and the most modern analytical and measurement methods, we are there for you from planning through construction to safe operation and will support you in benefiting from subsidies. Do get in touch.




Wind energy for the hydrogen economy

The development of the electrical grid and establishment of a hydrogen economy should contribute, among other things, to wind farms no longer needing to be shut down to avoid the overloading of the grid. Wind farm operators can benefit from investment grants under Germany's National Hydrogen Strategy, whose subsidies arise from the Renewable Energy Act (EEG).




Alongside the incorporation of electrolyzers and hydrogen storage or transport solutions on site, cross-sectoral concepts for the production and use of green hydrogen are also attractive here. Steel and petrochemicals, whose decarbonisation is only hard to achieve, are among the buyers of wind electricity with which electrolyzers can be operated.

Our services

From conception and component design to commissioning, including all recurring inspections – with our comprehensive services in the field of testing, inspection and certification, we will support you in the following phases of your project:

	Concept / planning	Production	Operation
			
Inspection of concepts to current legal requirements, standards and regulations	■		
Inspection of requirements specifications	■		
Inspection of technical specifications	■		
Inspection of component designs on the basis of standards, third-party requirement catalogues or customer demands	■		
Certification of protective devices	■		
Inspection of staggered power system protection plans, protection tests	■		
Analysis of electrical grids	■		
Certification of the grid connection	■		
Certification of protective devices, inspection, safety design	■		
Conformity assessments of electronic components/systems	■		
Inspection of the design, construction, functioning and reliability of hoists, cranes and load handling equipment	■		
Inspection of risk analyses to determine the potential risk of intervention by unauthorised persons	■		
Inspection of safeguarding concepts	■		
Inspection on determination of intervention measures by guarding/security company or police	■		

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	Concept / planning	Production	Operation
			
Inspection on determination of administrative security measures	■		
Technical due diligence	■		
Technical, financial, legal due diligence (with external partners)	■		
Inspection commissioning and periodic inspection concepts	■		■
Testing electromagnetic compatibility	■		
Project certificate	■		
Design evaluation of support structure	■		
Inspection on installation and operation of alarm receiving stations		■	
Production monitoring and auditing		■	
Inspection and support for commissioning and assembly works		■	
Acceptance and functional tests		■	
Acceptance tests (commissioning, periodic inspection) of isolated grids with involvement of e.g. decentralised generator units, electrolysers and any necessary storage systems (on and offshore)		■	
Inspection of switchgears/control cabinets to EN 61439-1			■
Inspection of electrical and mechanical safeguarding systems			■
Recurring inspections			■
Analysis of faults/unusual events with regard to cause, remedies and consequences			■

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