Industrial Solutions

Green ammonia as clean energy carrier

thyssenkrupp

CO_2-free conversion of sustainable energy for storage, transportation and more

By using green energy from solar power, wind power, hydropower or other renewable sources, ammonia can be produced in a sustainable way – quite literally from air and water. Our large-scale water electrolysis solution offers you significant economic advantages.

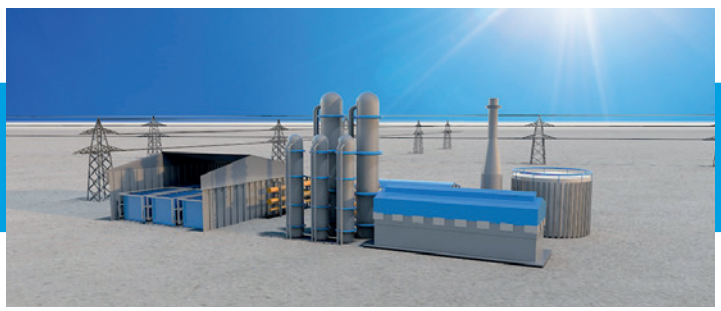
The patented large cells make highly efficient, industrial-scale hydrogen production possible. With our world-class ammonia process and globally proven EPC competence we can offer a complete plant for producing ammonia from atmospheric nitrogen and electrolytic hydrogen – with no CO_2 emissions. Thanks to proven processes from hundreds of chemical plants you profit from the high overall efficiency and reassuring reliability for optimal yields.

Your ammonia applications:

- Green energy storage and energy carrier
- Fertilizer applications
- DeNOx, e.g. for power plants
- Melamine
- Amination chemistry / nitrification chemistry e.g. for polyurethanes, polycarbonates

Integrated solution

Electricity from renewables



thyssenkrupp water electrolysis

uhde® ammonia synthesis by thyssenkrupp

Ammonia applications

engineering.tomorrow.together.

Industrial Solutions for the fertilizer industry

Globally proven, high-efficiency solutions

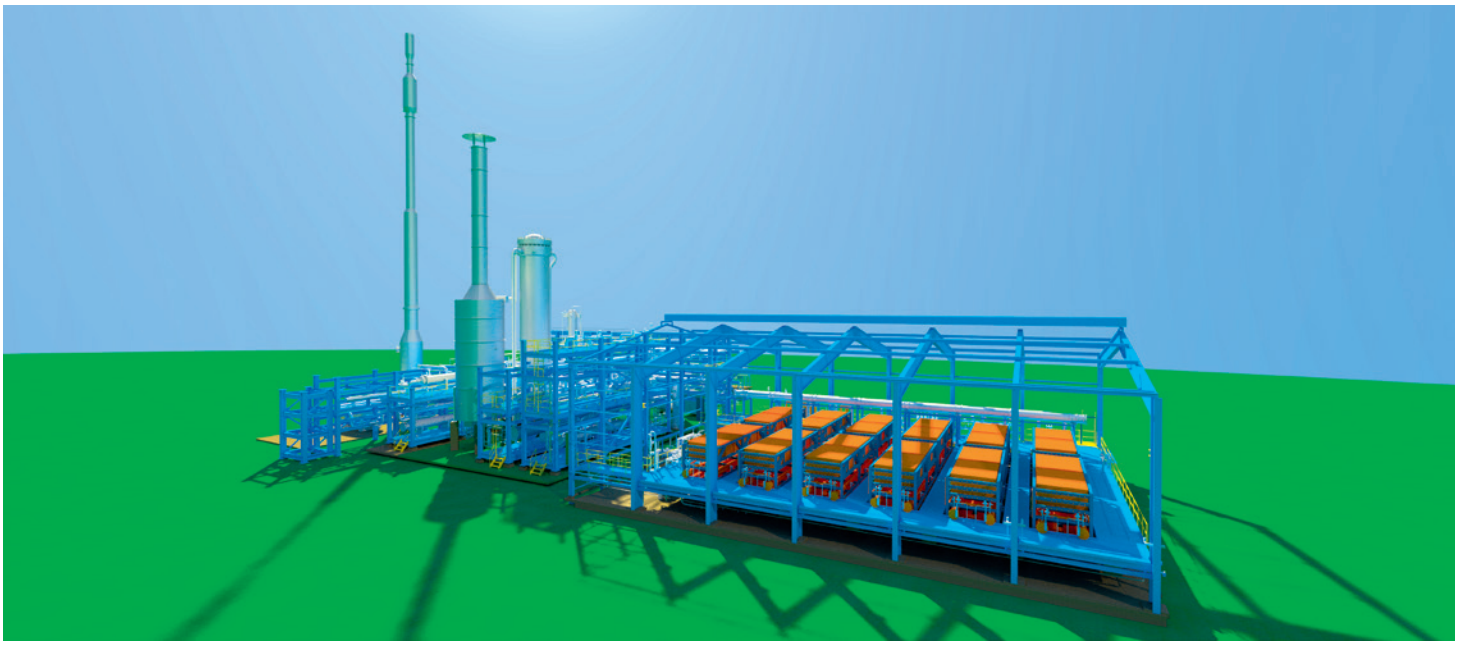
thyssenkrupp

How you benefit from the electrolysis-based ammonia process

- Proven designs based on operating reference plants
- Low-pressure synthesis with centrifugal compressor using uhde® radial flow-type ammonia reactor
- Cobalt-promoted magnetite catalyst with proven long-term reference for low-pressure synthesis
- Reduced complexity and O&M expenses
- 50 and 300 mtpd capacity modules reduce field construction time and associated costs

A reliable global partner

The thyssenkrupp Industrial Solutions business area is a leading partner for the engineering, construction and service of all industrial plants and systems. In collaboration with our customers we develop top-quality solutions and deliver efficiency, reliability and sustainability over the entire life cycle. Our global network of roughly 19,000 employees at 70 locations enables us to supply turnkey plants worldwide that set benchmarks in terms of value added and resource-friendly technologies. You benefit from our large portfolio and knowledge in the electrolysis and ammonia businesses – targeting trouble-free design, fair EPC project execution and reliable plant operations.



90 years of experience in ammonia

with around **120 ammonia plants built**

600 electrolysis plants

with more than **10 GW** of power installed

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