



thyssenkrupp

Insights\_Uhde



# Green methanol to mitigate greenhouse gases.

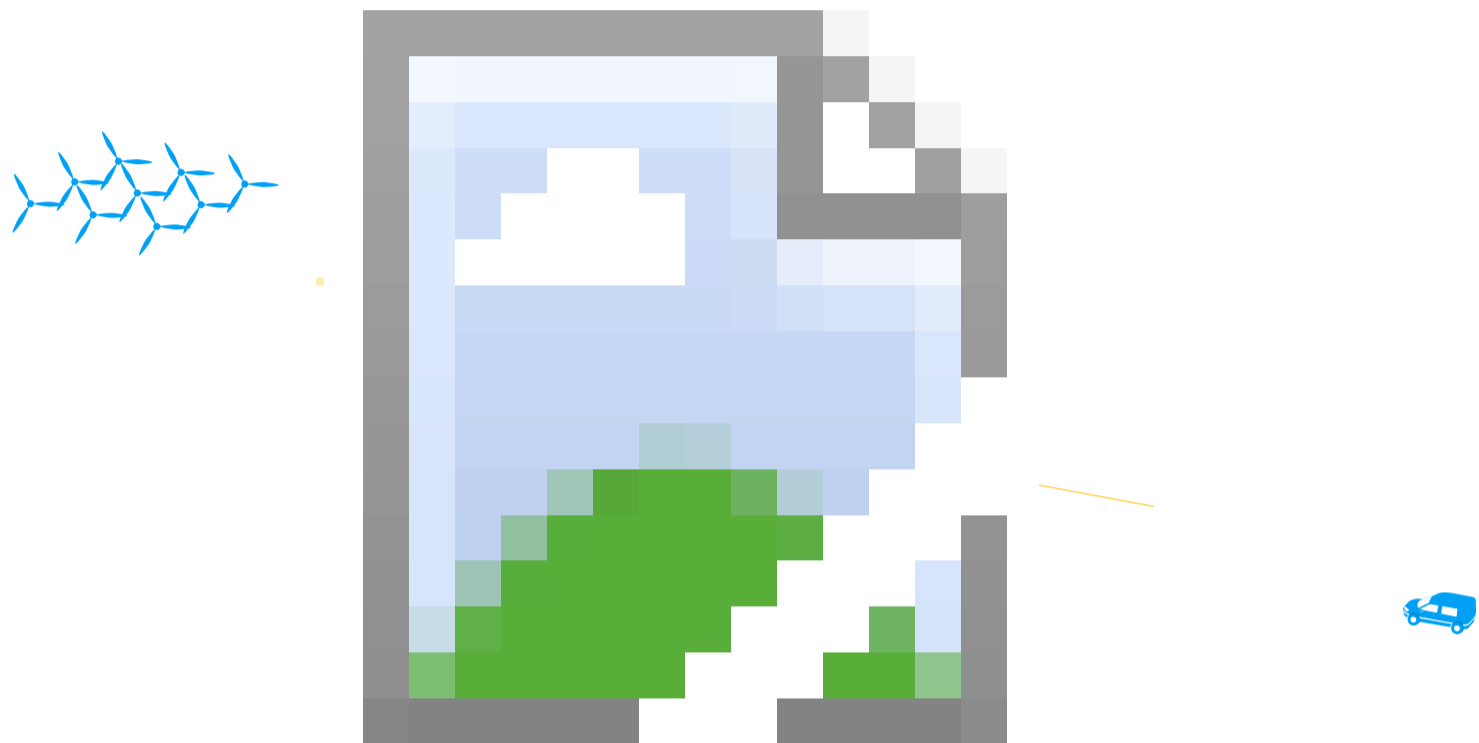
The synthesis of green methanol from hydrogen and carbon dioxide can help to tackle climate change by mitigating the impact of greenhouse gases. The power for the synthesis process comes from renewable sources, e.g. geothermal energy, hydropower or wind energy. Both the hydrogen production technology via alkaline water electrolysis and the methanol production technology are from thyssenkrupp Industrial Solutions.

Green methanol is not just environmentally sound but also very useful, for example as an energy carrier for electricity storage or a transport fuel. Methanol can be added to conventional gasoline or used to fuel 100% methanol-based drive systems. thyssenkrupp Marine Systems, the world's leading manufacturer of non-nuclear submarines, has already developed a methanol-reforming technology to produce the hydrogen required for their unique HDW Fuel Cell System on board the actual submarine.



The hydrogen is produced by means of the proprietary water electrolysis technology from thyssenkrupp nucera. The carbon dioxide is recovered from biogas plants, flue gas or waste gas.

## Uhde technology for small-scale green methanol plants



The power required for the Uhde methanol production technology comes from renewable sources such as geothermal energy, hydropower or wind energy. Countries like Iceland have vast supplies of geothermal energy. Countries like Norway have huge hydropower resources. Germany already produces more electricity from renewable sources than it needs. On 1 January 2018, for the first time in history, all the power consumed in Germany was generated by wind turbines and solar cells. In the future, experts predict that Germany will face a significant oversupply of electricity from renewable sources.

Use of our green methanol technology makes particular sense in countries where there is a legal framework supporting renewable energies, e.g. in Switzerland or Norway. The German government has decided to create a carbon-neutral transport sector by 2050. Green methanol produced from renewable sources can play a key role here.

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**The bottom line:** Our small-scale green methanol plants (100–200 tpd) are not only based on sustainable technology but also highly modularized to ensure a customized, cost-effective solution for each plant operator. What's more, we offer one-stop-shop solutions covering everything from EPC and plant operation to staff training, service and spare parts. Green methanol technology from thyssenkrupp – smart, sustainable and from a single source.

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