



# 400 MW Offshore Hydrogen Production takes System to new Levels

Putting the brakes on climate change and meeting the challenges of the energy transition is now more urgent than ever. Tractebel offers a solution. An experienced team of energy experts from Tractebel Engineering GmbH and offshore engineers from Tractebel Overdick GmbH have developed a unique concept for an offshore platform. This makes it possible to produce environmentally friendly “green” hydrogen from offshore wind energy at an industrial scale using electrolysis.

Delivering up to 400 MW, this kind of plant exceeds the output of previous technologies many times over. This future-oriented concept is already at the stage where it could be put into practice today.

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[Offshore Hydrogen Production](#)

## Innovative Approach to green Hydrogen Solutions

With its international, independent and multidisciplinary expertise, Tractebel offers an integrated approach covering all aspects of your green hydrogen projects or energy projects as Owner’s Engineer, Lender’s Engineer, Consultant Engineer or Contractor’s Engineer.

Here experts have been working on the development of green hydrogen projects for more than 3 years, covering the entire chain: from production through renewable energy to its final use either for:

- Energy storage
- Mobility
- Industry
- Raw material for the production of other fuels.

The services for hydrogen and energy projects include studies such as market studies, concept studies, feasibility studies, grid connection studies, wind and solar resource assessments, energy yield assessments, site selection studies. Experienced engineers and specialists provide energy system modelling, economic and financial modelling, project management, technical due diligence and more.

We establish project teams which combine long-term experience in project development, assessment, construction and operation with local experts including the specific requirements.

## Offshore Hydrogen Platform

Using an innovative offshore platform as the basis, it enables a number of tasks to be solved simultaneously.

1. It enables the proportion of “green” hydrogen in the energy mix to be effectively increased on a CO<sub>2</sub>-neutral basis.
2. The wide range of options for transporting H<sub>2</sub> provides relief for the electricity transmission grid, the capacities of which are limited.
3. H<sub>2</sub> as an efficient energy storage medium can balance out seasonal fluctuations in renewable energy sources.

## Enormous Potential

Hydrogen can play an increasingly important role in the energy mix because it serves as an efficient form of storing energy and is easily transportable. Existing infrastructure consisting of gas pipelines and storage facilities such as underground caverns can be used for this purpose. H<sub>2</sub> can also be stored on ships and transported anywhere in the world. As a source of energy, H<sub>2</sub> is used to power gas engines, gas turbines and fuel cells, but can also be used as a supplement to natural gas in private households, for example. In addition, hydrogen is a key industrial raw material and source material for the production of ammonia, for example. It can also be used as a CO<sub>2</sub>-neutral reducing agent to substitute coke in steel production.

“In large-scale offshore wind farms in the German North Sea and other locations worldwide there is enormous potential for CO<sub>2</sub>-neutral production of green hydrogen,” says Klaas Oltmann, Director of Business Development at Tractebel Overdick.



Based on the new type of platform model, he and his colleagues are currently working on a detailed solution for the use of the platform on an industrial scale (up to 400 MW). It accommodates all the technical components required to produce “green” hydrogen. This includes the electrolysis units and transformers for the transformation of the electricity supplied by the offshore wind turbines, along with desalination plants for producing high-purity water required for electrolysis.

## Growing Flexibility

The means of transport for the generated energy are diverse and flexible. High-voltage cables on the seabed are currently used to transfer the wind-generated electricity to the mainland, but capacities are limited. Offshore-generated hydrogen as a source of energy opens additional options, as it can be transported in both pipelines and ships. In this way, offshore H<sub>2</sub> production could make further expansion of wind turbines possible without straining current limited electrical grid capacity. Moreover, hydrogen can also make an important contribution on the mainland too, by providing relief for the situation with regards to the distribution of electricity from north to south.

## Competitive Costs



Compared to the costs of production of “grey” hydrogen from fossil sources, the costs for “green” hydrogen are currently higher. “On the basis of the economies of scale that we are currently observing in large-scale electrolysis plants and a higher tax on CO<sub>2</sub> emissions, that will change,” says Tractebel Project Engineer Felix Knicker, “which will put the different technologies on a level footing with each other in terms of opportunities.” The critical cost factor is the design of the system and the efficiency of the plants for the production of “green” hydrogen. “Our concept includes the appropriate solutions for cost-optimised designs and efficient operation,” observes Felix Knicker.

Future demand will also increase the competitiveness of the new technologies as well. Offshore wind power is a source for renewable energy which provides sufficient potential for expansion. Wind farms at sea will be installed at ever greater distances from the coast and in much deeper water in the future. That leads to higher costs for the construction of the plants and transport via high-voltage cables. Tractebel offers an alternative which is attractive in economic terms.

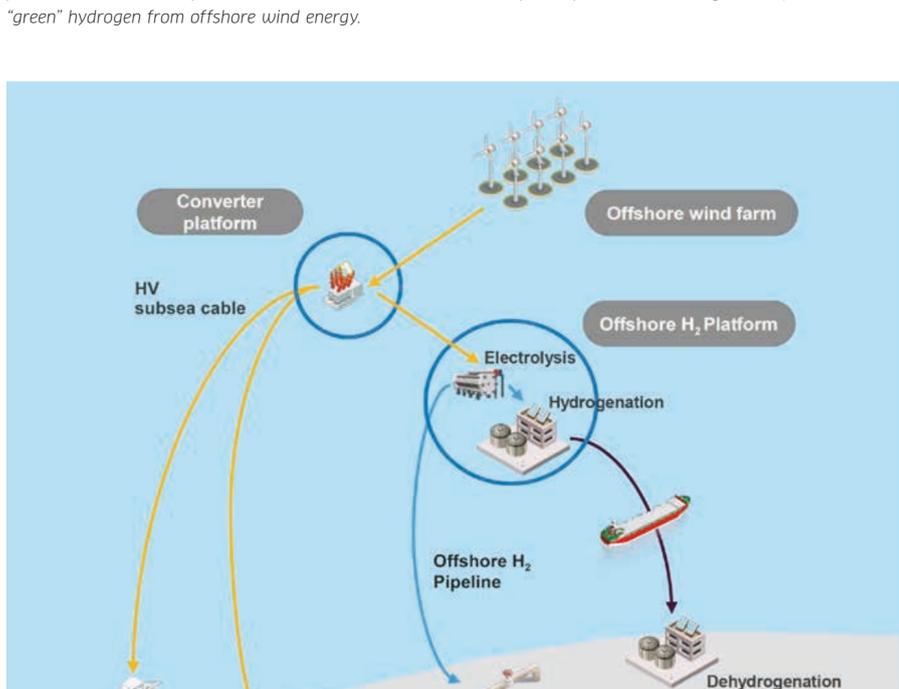
## Execution

The development of offshore hydrogen production platforms on a scale of several hundred MW are investments which could be attractive for wind farm operators and energy suppliers or industrial companies which use hydrogen in their production processes.



The platform model from Tractebel contains a complete plant for the industrial production of CO<sub>2</sub>-neutral “green” hydrogen from offshore wind energy.

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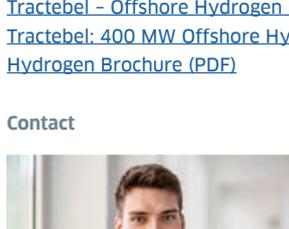


Introduction to H<sub>2</sub> offshore pathways

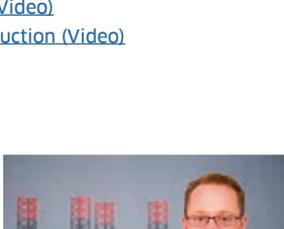
## Further Information

[Tractebel – Offshore Hydrogen Production \(Video\)](#)  
[Tractebel: 400 MW Offshore Hydrogen Production \(Video\)](#)  
[Hydrogen Brochure \(PDF\)](#)

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