



Medium and long-term prospects for green hydrogen production

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Hydrogen will emerge along three phases with a wide positioning along the value chain

Great opportunities within the next 15 years



Uniper to transform

Unprecedented momentum for decarbonization and hence hydrogen (H₂)



Uniper ready to scale up hydrogen and for sector coupling

**WindGas
Falkenhagen**

2013

Start of operation

2018

Addition of methanation
plant

Production

H₂ injection into
gas transportation
pipeline

**WindGas
Hamburg**

2015

Start of operation

Production

H₂ injection into
gas distribution
pipeline

**Reallabor
Bad Lauchstädt**

2019

Start of planning

Industry

Shaping a (green)
H₂ economy in the
Central German
Chemical Triangle

**Uniper installed
gas turbines**

H₂

compatible

Power generation

Gas turbines
hydrogen
compatible

Importance of the different types of hydrogen

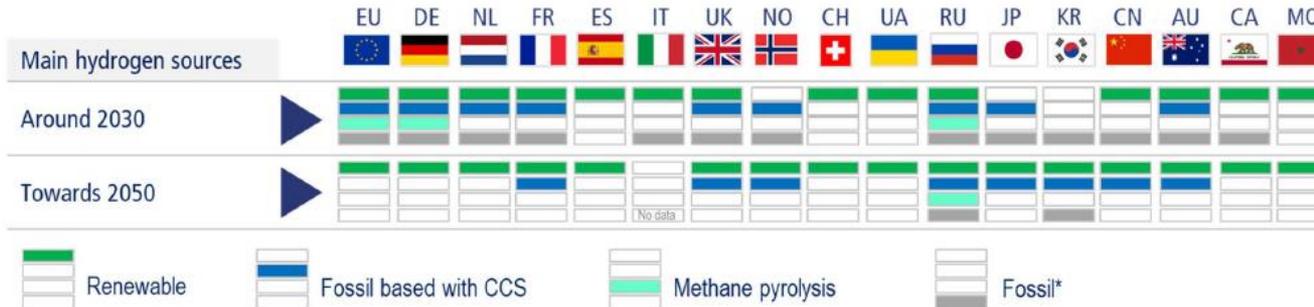
H₂-related requirements: the color of hydrogen

Around
2030

- Renewable and fossil-based hydrogen (with and without CCS) are generally considered viable medium-term sources.
- Methane pyrolysis for hydrogen production is mainly discussed as option in the German and Russian strategies.

Towards
2050

- Renewable hydrogen is the most favorable hydrogen quality in the long-term. Various countries considering it the only viable long-term option.
- Fossil based hydrogen with CCS is regarded a feasible hydrogen source in the long-term in a range of countries.



* In Russia in 2050 mainly based on nuclear power

Hydrogen imports will be needed

H₂

German green hydrogen production planned to be at 14 TWh

German Hydrogen demand is projected at 90–110 TWh

Gap 2030 \geq 76 TWh

Conclusions

- Political momentum to develop a H₂ market in Germany / EU
- Adaptation of the levy and charge system necessary to allow the effective establishment of a hydrogen market with simultaneous recognition of the green characteristic (RED 2)
- Technological openness in production and consumption is essential to make decarbonisation as cost-effective as possible
- Germany has a large import demand for hydrogen
- Russia has great potential for hydrogen production
- Introduction of Guarantees of Origin required for green and decarbonised gases
- On the basis of the long-standing energy partnership, Russia is a key partner for Germany and beyond in building a hydrogen economy
- Chances for value creating partnerships for Russian and German companies

Our Purpose

**Empower
Energy
Evolution**

**uni
per**