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## Game changer hydrogen

Hydrogen has long been on the political agenda on a national and European level. Being pushed by the Green Deal of the European Commission already, hydrogen is now on the way to become an overall game changer for German industry. As part of a €130 billion heavy economic stimulus package, the German Federal Government has allocated the substantial amount of **€9 billion for the hydrogen sector**, in addition to the existing hydrogen-related investments and R&D programs. This stimulus package together with the National Hydrogen Strategy (*Nationale Wasserstoffstrategie*), which were passed on the June 3 and 10, 2020 respectively, provide an enormous boost for the hydrogen market. The German Government aims to generate 5 GW of electrolyzer capacity by 2030 and an additional 5 GW later on.

Through this program, the German Federal Government acknowledges the key role which hydrogen can play in lifting energy markets to the next level by coupling gas and electricity, facilitating the integration of renewables, and providing decarbonization solutions for the mobility sector and carbon-heavy industries such as chemicals, petrochemicals and steel. Highlighting its huge economic potential and existing capabilities, hydrogen is seen as an opportunity to mitigate the economic consequences of the COVID-19 pandemic and to help the country emerge even stronger from the crisis.

## Germany's approach to promote hydrogen-related technologies

The National Hydrogen Strategy creates a framework to promote development and innovation in hydrogen-technologies and to facilitate the expansion of the hydrogen market. It identifies future strategic sectors for hydrogen, including the industrial sector (especially chemicals, petrochemicals and steel), the mobility sector (especially heavy goods transport, commercial vehicles, shipping, aviation), the heating sector, as well as buildings and power generation.

At the center of the strategy is “green” hydrogen, meaning hydrogen produced on the basis of renewable energy. The strategy envisions a switch from coal, oil and natural gas to hydrogen in industrial processes. It envisions building German production plants for green hydrogen with a total capacity of up to 5 GW), including the necessary offshore and onshore power generation, by 2030. An additional 5 GW will come later. Even though such capacity is not nearly sufficient to satisfy the hydrogen required to decarbonize industrial processes over time, it is a step in the right direction and a good starting point.

While the German Government is clearly focused on green hydrogen, it acknowledges that blue or turquoise imports

are necessary to meet Germany's excess demand. Partnering with European and non-European countries to import hydrogen is part of the National Hydrogen Strategy.

## Action plan

The National Hydrogen Strategy proposes an action plan, setting out 38 measures for the first phase from 2020 to 2023. These will be reinforced by additional measures in a second phase between 2023 and 2030. With the 38 measures, the Government combines strong incentives in some areas with strict regulations in other sectors.

These measures include:

- An improved regulatory framework concentrating on sector coupling, improving the design of the state-induced price components of energy sources towards climate goals, recognizing the use case for grid usability, strengthening the possibilities for generating green hydrogen by exemptions from the EEG surcharge;
- The introduction of CO<sub>2</sub> pricing for fossil fuels in the transport and heating sectors;
- Programs to support investments into electrolyzers for industry to decarbonize industrial production, e.g. by potentially introducing tender models for the production of green hydrogen to decarbonize the chemical and the steel industries;
- Carbon Contracts for Difference to incentivize investments;
- Offshore-production of hydrogen and power-to-x;
- Acceleration of the implementation of the EU Renewable Energies Directive (RED II) into national law, by introducing an ambitious renewable energy quota for green fuels and by incentivizing the increased use of "greener" fuels and kerosene for road traffic and aviation;
- Programs to support the increase the number of hydrogen filling/charging stations;
- CO<sub>2</sub> based toll system for heavy road transport;
- Support for the development of an internationally harmonized standard for mobility concepts based on hydrogen and fuel cells;
- Programs for hybrid-electric aviation, green shipping and zero-emission-waterborne transport;
- Carbon capture frameworks to support e.g. the decarbonization of the steel industry;
- Comprehensive and well-funded R&D programs under the umbrella of the Hydrogen Strategy 2030;
- Support for the development of European sustainability standards, codes and regulations, the European Green Deal and European Hydrogen programs and strategies;
- Development and enhancement of global hydrogen partnerships and development programs.

## Outlook

In summary, Hydrogen will play a key role in the future of energy and the economy - not just in Germany but Europe-wide and globally. For Germany to stay competitive and to push ahead, the implementation of the hydrogen strategy into a regulatory framework and action by industry players and investors are crucial.

# Your Key Contacts



**Dr. Gabriele Haas**

Partner, Frankfurt

D +49 69 45 00 12 393

M +49 160 5065 769

[gabriele.haas@dentons.com](mailto:gabriele.haas@dentons.com)



**Thomas Schubert**

Partner, Berlin

D +49 30 26473 430

M +49 1511 6734 227

[thomas.schubert@dentons.com](mailto:thomas.schubert@dentons.com)