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HYDROGEN

The German national hydrogen strategy: big ambitions, right focus?

The fact that energy transition means more than just a transformation of electricity supply has now become widely accepted in the energy policy debate. The temporal fluctuations in electricity generation from wind and sun are too great to be balanced by intermediate storage and grid expansion alone. Sector coupling, i.e. the cross-sector use of electricity generated from renewable sources, is an often mentioned concept in this regard. Among the various conversion technologies, power-to-gas has been widely discussed in recent years. Renewable electricity can be used here as an input in the electrolysis process to break down water into hydrogen and oxygen molecules virtually emission-free. The »green« hydrogen produced in this way will then be available for applications in the heat and mobility sector and as an industrial raw material, in addition to the option of converting back into electricity. However, apart from a few pilot projects, the market ramp-up in Germany has so far failed to materialise. This is attributed to high start-up costs and the absence of a consistent regulatory framework.

With its national hydrogen strategy, the German government has finally set a comprehensive framework for building a sustainable hydrogen economy in Germany in the upcoming years. A broad mix of measures was announced, including investment aid for electrolysers, research funding, expansion of the distribution infrastructure, especially for mobility applications, and exemption of hydrogen producers from the EEG levy. From the recent economic stimulus package alone, nine billion euros shall be provided for this purpose in the future. As an interim goal, an expansion of electrolysis capacity in the magnitude of 5 gigawatts by 2030 is set, an immense increase compared to the approximately 25 megawatts of capacity in the current pilot projects.

For ambitions regarding global leadership, however, a pure focus on capacity building will not be sufficient. Effective promotion should always be primarily based on future viability. On the one hand, this requires a strong link to the long-term climate policy goal of greenhouse gas neutrality. This applies not only to hydrogen production itself, but also to the design of the value chains as a whole. For example, investment support

must not come at the expense of efforts to further expand renewable electricity generation in Germany. This is because the hydrogen produced by electrolysers is only »green« if the electricity used in

production is as well. In this regard, it will be most important to effectively exploit the remaining potential for wind power in Germany, by reforming distance regulation and financial support measures. On the use side, the use of funds should also be prioritized for those sectors in which the greatest decarbonization potential can be exploited by using »green« hydrogen. At present, this applies above all to industrial use in chemistry

*»Promotion with the goal of
greenhouse gas neutrality«*

and metal processing. Any associated cost increases in the initial phase should be temporarily accompanied by supplementary support in order to ensure that international competitiveness is maintained.

At the same time, energy efficiency should always be taken into account as a side goal. In this respect, the announced focus on research funding is an important signal. In the future, losses in energy conversion must be further reduced through innovation. This

»The efficiency of regional hydrogen infrastructures must be considered«

applies not only to electrolysis. The development of regional hydrogen infrastructures should also be driven by efficiency considerations. This requires a clear focus on those areas of application where green hydrogen has practical advantages over other renewable energy technologies. Within the mobility sector, for example, it makes sense to focus specifically on the truck and bus transport segments, since this is where hydrogen-based fuel cells can exploit their advantages of a longer range and faster charging compared to battery systems.

Finally, it remains important to look beyond the national horizon. With its announcement to use hydrogen as a means in development cooperation, the government has recognised the global dimension of the sustainability problem and the asymmetric distribution of renewable energy potential in the world. However, the European perspective must not be neglected as well. Much remains to be done in the field of European

»European promotion of hydrogen«

energy policy cooperation. This applies to transnational network planning, but also to the creation of common technical standards in hydrogen technologies. Only comprehensive market integration can ensure that future regional supply or demand surpluses will be balanced across national borders. At the end of the day, it will be these questions that decide whether Germany becomes a global hydrogen champion.