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The German hydrogen strategy: green hydrogen in the spotlight

Michał Kędzierski

The German government adopted a National Hydrogen Strategy (German: *Nationale Wasserstoffstrategie*) on 10 June. The document outlines the main trends, assumptions and instruments of support for the government policy for the development of the hydrogen economy in Germany. The strategy's declared goal is for the state to create favourable conditions for the private sector to invest in the production, transport and use of emission-free hydrogen in order to decarbonise further branches of the economy.

The document recognises green hydrogen (obtained by water electrolysis using electricity produced using renewable sources) as the only solution that meets the requirements of sustainable development in the long term. Therefore, its production will be widely supported. The government's goal is to achieve 5 GW of electrolysis capacity by 2030 (10 GW by 2040), which is expected to translate into producing 14 TWh of hydrogen annually. The measures taken to support the production and improve the competitiveness of green hydrogen include: exempting electrolyser operators from the RES fee (EEG-Umlage), which constitutes 20% electricity prices in Germany. The estimated demand for hydrogen in 2030 is expected to reach around 90–110 TWh (currently 55 TWh). The German government assumes that an EU hydrogen market will be formed in the coming years where its other CO_2-neutral variants will also be available: blue – obtained from natural gas using carbon capture and storage technology (CCS), and turquoise – obtained through methane pyrolysis.

The strategy above all envisages replacing fossil fuels with hydrogen in industry (especially the steel and chemical sectors) and in heavy transport (where its use is expected to become competitive in a relatively short time, or where no other decarbonisation solutions are available). As for industry, the government intends to financially support investments, both by purchasing and using electrolysers, and by compensating for steel manufacturers' losses resulting from using hydrogen instead of coal (as part of so-called 'Carbon Contracts for Difference'). The solutions planned to be applied to the transport sector include subsidies for buying hydrogen vehicles, determining a minimum RES share in fuel used above the 14% threshold determined in the EU's RED II directive by 2030, and obliging airlines to use fuel with at least a 2% addition of synthetic kerosene. The government expects that hydrogen's role will also grow in the heating sector and light transport some time later. Building hydrogen transport infrastructure for industry, which will be based on the existing natural gas transport network, is expected to contribute to the development of the hydrogen market. Financial support will also be provided for increasing the number of hydrogen refuelling stations for transport (there are around 80 of them in Germany at present).

Commentary

- The clear choice of green hydrogen in the strategy is an attempt to combine the need to decarbonise the economy and the development of technologies which are viewed as future-proof. Germany wants to become a global leader in the area of development, production and export of technologies for producing and using green hydrogen. It hopes that the increasingly important climate policy will contribute to investment in emission-reducing solutions worldwide. This, in turn, is expected to create new opportunities of expansion for German firms offering finished, reliable and future-proof products.
- It took six months longer than planned to adopt the strategy due to disputes between the ministries engaged in determining its shape. The key points of disagreement included:
  - the role of blue and turquoise hydrogen – the Ministry for Economic Affairs and Energy (BMWi) wanted it to be defined in broader terms, arguing that the demand for hydrogen is high; this was opposed by the Ministry for the Environment (BMU) and the Ministry of Education and Research (BMBF), which would rather focus on green hydrogen as the only totally emission-free variant and a technology for the future;
  - German electrolysers' target total capacity in 2030. the BMWi insisted on that a capacity of 3–5 GW be decided on, fearing that allocating too many RES installations for handling electrolysers would jeopardise the process of replacing the energy from nuclear and coal power plants undergoing decommissioning with energy generated by renewable sources. The BMBF and the SPD parliamentary grouping wanted a target capacity of 10 GW to be set, arguing that it was necessary to ensure rapid market development and favourable conditions for investments;
  - the preferred areas of hydrogen use. The BMWi, BMBF and the Ministry of Transport wanted to support investments in hydrogen technologies in all sectors of the economy and all possible uses. The BMU insisted on focusing on industry and heavy transport as the branches with the highest potential for reducing emissions.

- The fact that Germany is unable to satisfy its high demand for hydrogen from its own sources means it will have a long-term reliance on hydrogen imports. According to government estimates, until 2030 only 13–16% of the hydrogen used will originate from local electrolysers. From Germany's viewpoint, this adds to the need to create an international market and transport infrastructure. The remaining hydrogen will most likely be supplied above all from the Netherlands and Norway and in the future also from Russia. Germany also intends to import green hydrogen from Africa – Germany would provide both technologies and financial support to African countries (the first project is planned to be launched in Morocco).
- Germany wants to make the hydrogen issue a priority of its presidency of the Council of the EU in the second half of this year. Berlin will make efforts to ensure that the EU's hydrogen policy complies with the directions set in the national strategy and that it complements it. Germany is planning to lobby on the EU level for priority treatment to be given to green hydrogen and for regulations to be adopted that will make it possible to create an European hydrogen market and transport infrastructure as soon as possible.

Berlin will also insist on developing community instruments guarantee demand for hydrogen, for example in aviation and metallurgy. The priorities on the German agenda include the development of co-operation in the area of the offshore wind power sector and using it for the production of green hydrogen.

- The implementation of the goals set in the German strategy will be a long and expensive process which will require multibillion investments, especially in the initial phase. The government intends to allocate up to 20 billion euros for this as part of various support programmes. The long-term costs of the decarbonisation of individual sectors of the German economy are much higher (30 billion euros in the case of steel industry and 45 billion euros in the case of the chemical industry). For this reason Germany will make efforts to gain access to additional sources of financing, including the priority treatment of investments in the production, transport and use of hydrogen in the process of applying for EU funds.
- The development of hydrogen technologies is expected to be one of the key driving engines supporting market recovery in Germany during the post-pandemic economic crisis and the green modernisation of the economy. 9 billion euros out of 130 billion euros from the stimulus package adopted by the federal government on 3 June have been allocated for the implementation of the hydrogen strategy goals: 7 billion euros will be assigned to projects in Germany and 2 billion euros to foreign investments, mainly in Africa, aimed at promoting German technologies and satisfying import needs in the future.