

Strategy paper for the development and implementation of a support program "H2Europe" for the market introduction of green hydrogen on a European level

The EU announced in July 2021 with the announcement of the "Fit for 55" program that at least 50 percent of the hydrogen needed in European industry must be produced with electricity from renewable energy sources by 2030 (green hydrogen). Previously, the EU has already announced a 2 x 40 GW electrolysis program to create the necessary generation capacity to produce the required green hydrogen volumes. To implement this program, a total investment of over 150 billion euros is required by 2030. These investments can only be made if the appropriate regulatory framework for a market-based secured demand for green hydrogen in the amount of more than 6 million tons per year is implemented in a legally secure manner. However, this implementation will take considerable time, which will delay the development of the required generation capacities and thus the 2030 target would be missed. At the same time, there is a risk that with a delayed ramp-up of hydrogen technologies, Europe will lose its global technology connection.

For an immediate market ramp-up, it is therefore necessary to develop and implement a market-oriented support program to compensate for the differential costs between fossil fuels and green hydrogen. In Germany, the H2Global program is currently being implemented for this purpose. This model is also recommended for the precompetitive market introduction of green hydrogen at the European level.

On behalf of GIZ, DWV has developed the H2Global concept in 2020/2021 with an interdisciplinary team of experts, with funding from the German Federal Ministry for Economic Affairs and Energy (BMWi), in consultation with representatives of German industry, banks and institutes. In contrast to the well-known CAPEX funding programs, which usually cannot lead to a positive economic result due to European state aid regulations, the concept allows for an economic operation of the PtX projects based on the principle of a market economy.

The aim of the initiative proposed here is to transfer the H2Global concept to the European level and to expand it to include a long-term sustainable hydrogen energy strategy in order to create reliable and investment-proof framework conditions for the construction and operation of 4 GW within the European Union and 4 GW outside the European Union in the short term. In particular, the program is intended to initiate projects that could be a starting point for the transport of green hydrogen via existing or new pipelines due to the very low transport costs. This is to lay the foundation for a renewable supply-secure cost-efficient European energy economy, taking into account the geopolitical effects arising from the change.

The H2Europe concept, like the German H2Global program currently being tested, is intended to temporarily compensate for the difference between the purchase price (generation plus transport costs) and the sales price (currently equivalent to the market price for fossil H₂) for green hydrogen and hydrogen derivatives. By temporarily indirectly subsidizing the price of green hydrogen for at least 10 years, the aim is to stimulate long-term market-based demand for zero-emission produced hydrogen in Europe in order to incentivize private investment in H₂ production, transport and application infrastructure in Europe and outside Europe as soon as possible.

To bring supply and demand together, an intermediary is envisaged to enter into long-term offtake contracts of at least 10 years on the supply side and short-term resale contracts on the demand side. It temporarily balances the existing difference between supply and demand prices for green H₂ and PtX via a support mechanism inspired by the Contracts for Difference (CfD) approach. Operator consortia and investors thus receive the necessary planning and investment security for the development of large-volume electrolysis capacities, as they can base their business and financing model on the long-term offtake contracts at cost-reflective prices, in anticipation of future regulatory frameworks designed in line with the market economy.

In order to implement the concept efficiently and in line with the market economy, prices are determined on the buying and selling side using a double auction model. The lowest offer price and the highest selling price are each awarded the contract so that the price difference to be compensated is as small as possible. The purchase of green hydrogen and PtX includes delivery to Europe for non-European projects. Anticipated increases in willingness to pay for green hydrogen and PtX due to adjustments in market regulation contribute to the sales price achieved being expected to increase over time. The funding required to compensate for differential costs thus gradually decreases until the purchase and sales price are in full alignment in perspective.

Necessary preparatory measures

- Political decision at the European level to implement such a funding instrument and to commission the preparatory measures required for it
- Establishment of a task force in 2021 to analyze
 - of the required funding volume to compensate for the differential costs for the 2 x 4 GW (approx. 20 billion EUR excluding infrastructure costs),
 - possible partner countries outside the European Union,
 - the possible generation and demand within the EU,
 - the need for intra-European exchange of green hydrogen and its derivatives.
- Develop a structure to manage the funds of the H2Europe Fund and the implementation of the calls for proposals by the Task Force.

- Funding of the task force for the technical and legal analysis and design of the concept (approx. 3 million EUR).
- Based on the results of the task force, provision of the financial resources required.
- Implementation measures
 - Establishment of an independent non-profit European body in 2022/2023 to conduct the tenders and handle the compensation of differential costs.
 - Grant contract in favor of the non-profit European body in 2022/2023.
 - First tenders within and outside Europe are planned for 2023.