

January 2023

1 Hydrogen Bank

1.1 Background

On 16 March 2023, the European Commission proposed the foundation of a [European Hydrogen Bank](#) (EHB) to meet its goals for green hydrogen. The EU has set targets of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of renewable hydrogen imports by 2030 under the [European Hydrogen Strategy](#) and the [REPowerEU Plan](#).

The EHB will be an instrument based on four pillars: (i) domestic market creation; (ii) imports to the EU; (iii) transparency and coordination; and (iv) financing mechanisms to support renewable hydrogen production within the EU and internationally. The European Hydrogen Bank will have an endowment of €3 billion to support the EU's developing hydrogen economy.

1.2 Key Elements of the European Hydrogen Bank

- **Support for EU-based production:** EU producers can participate in fixed premium auctions. These auctions will award a subsidy to hydrogen producers, to be paid by the EHB, in the form of a fixed premium per kg of hydrogen produced for a maximum of 10 years of operation. The auction design for the 2023 pilot iteration is currently being developed. The first pilot auctions are expected to be launched in autumn 2023, backed by EUR800 million from the Innovation Fund.

Through these auctions, the Union seeks to ensure that green hydrogen can become a financially attractive alternative to grey hydrogen. The potential market of customers is relatively small given the current price of renewable hydrogen vis-à-vis fossil-based alternatives – between €2.5-€15 per kilogram for renewable hydrogen, with the average cost at the upper end of this range, versus as little as €2 per kilogram for grey hydrogen.

- **The requirement to produce 'renewable' hydrogen:** Access to the financial schemes offered by the EHB will only be available to projects producing 'renewable' hydrogen compliant with the final versions of the Delegated Acts of the Renewable Energy Directive. These set out the requirements for 'renewable' hydrogen production, including additionality, temporal correlation, and geographical correlation.
- **EHB as a single auction platform across the Member States.** To prevent fragmentation during the early stages of hydrogen market formation in Europe resulting from differing support schemes across Member States, the Commission has proposed to use the EHB to offer a single EU-wide auction platform. Under this approach, projects would be ranked at the EU level, and the best bids (irrespective of home Member State) will be awarded subsidies until the budget available to the EHB is exhausted. After this, Member States can use the same ranking system to provide their own support for domestic projects, subject to EU State Aid rules.
- **Non-EU producers** may also be able to participate in separate schemes, mirroring the auction-based subsidies available to EU producers. The Commission is currently assessing the feasibility of creating a similar fixed premium auction system for which third-country exporters to the EU or EU off-takers contracting with third-country producers can apply.

- **EHB to centralize EU-supported project funding.** Currently, several different funding programs are available at the EU level; for example, direct project support through the Europe ETS Innovation Fund, support for Hydrogen Valleys through Horizon Europe, and the Connecting Europe Facility. The Commission proposes that the EHB will streamline the support these instruments provide.
- **EHB to perform a coordination and transparency function.** The Commission intends for the EHB to support coordinating Member State and company-level Memoranda of Understanding with third countries and foreign hydrogen producers. The aim is for this coordination and centralization to allow the EHB to gain visibility on where and when hydrogen infrastructure will be necessary. Again, details on how this will be achieved are to be determined.

1.3 FEDIL Position

While the EU imposes strict specifications and complicated requirements for the electricity used to run clean hydrogen electrolysis, the IRA does not have such restrictions. It succeeds in promoting clean hydrogen in a much straighter manner.

Under the IRA, clean hydrogen plants can receive, already in 2023, a production tax credit of up to \$3 per kg of produced hydrogen, depending on the carbon emissions involved in the production, for the first 10 years of operation. The fewer GHG emissions the lifecycle of the hydrogen entails, the more support it gets. The tax cuts run through 2032, encouraging projects to start early to ramp up hydrogen production rapidly. Projects starting in 2023 would benefit from the entire 10 years' worth of credits, while plants opening later would receive progressively less. The IRA offers multiple benefits to producers of green hydrogen, including generous provisions. Firstly, those who produce green hydrogen using renewable electricity are eligible for both tax credits for producing renewable power and for producing hydrogen. Moreover, for the initial five years of operation, the hydrogen tax credit is a "direct pay," implying that clean hydrogen producers can receive a tax refund equal to the worth of their tax credits. Additionally, clean hydrogen and renewable electricity producers can use "transferability" tax benefits, meaning that producers with no tax liability can sell their tax credits to purchasers with tax obligations.

As contrast, the EU only recently defined in the "delegated acts" the conditions for hydrogen to be accepted as green: This new regulation requires that renewable hydrogen be produced only with additional, i.e., newly, dedicated and directly connected renewable electricity generation equipment or if not directly connected that the hydrogen be produced only during the hours that the renewable electricity generation equipment is producing electricity (hourly temporal correlation) and only in the area where the renewable electricity generation equipment is located (geographic correlation). Further, grid electricity may be used to produce renewable hydrogen without further restrictions only if the renewable energy share in the grid has exceeded the 90% threshold in one of the last five calendar years. As a reference, in 2021, Sweden had the highest share of renewable energy, with around 60% renewables, while the EU average is at around 23%. All these restrictions are not only complicated to fulfill, but they inevitably make green hydrogen projects scarce and more expensive than in the US, limiting the potential for a rapid expansion of this clean fuel in Europe. They reduce the positive impact of economies of scale and might even risk compromising Europe's ability to meet its production targets of 10 million tons of domestic renewable hydrogen production. Putting this production volume into perspective, shows the enormous challenge: it would require 550 TWh/year of renewable power for alkali electrolyzers, or 180 GW of installed capacity of wind turbines (i.e., new 18.000 wind turbines of 10 MW considering a power factor of 35%).

Considering all these limitations and restrictions, the EU Commission has granted a transition period until 2028 for the additionality condition and 2029 for the temporal

correlation. In contrast, IRA will grant subsidies for clean hydrogen already in 2023, no exceptions or transition periods are needed.

In order for the EU to effectively establish a reliable hydrogen supply, despite its imposed limitations, it is essential to provide the EU Hydrogen Bank with significant resources. The bank should be empowered to bolster domestic hydrogen production, making it at least equally enticing for investors to undertake hydrogen production projects in the EU as they would in the US or other regions, despite the existing constraints.

The success of this endeavor is imperative for Europe. Failing to sufficiently scale up renewable hydrogen production to meet its climate goals could have dire consequences. On the one hand, we can expect that Europe will have to import huge volumes of hydrogen from third countries. Such imports will not only create a new energy dependency, much like the one we know from Russian gas. It also risks slowing the expansion of Europe's local production capacities because the less constrained, imported hydrogen may be cheaper than the one produced in Europe.

On the other hand, Europe risks losing significant parts of its industry from sectors that are hard to decarbonize without access to competitively priced and securely available clean hydrogen. Steel and aluminum makers, cement producers, and glass manufacturers might decide to relocate their productions in parts of the world that provide direct and unconstrained access to cheap, clean hydrogen and export their goods to Europe instead.

One strategy to avert such a scenario is to structure the EU Hydrogen Bank's auction system to prioritize bidders who have off-takers in energy-intensive sectors facing hard-to-abate decarbonization challenges.