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**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**on the European Hydrogen Bank**

## 1. INTRODUCTION

Hydrogen will play an important role in the EU's transition to climate neutrality by 2050 and in the objective to become independent from Russian fossil fuels well before 2030. Hydrogen is also one of the strategic areas of the Commission's New Industrial Strategy, with significant potential for quality job creation. The European Hydrogen Strategy<sup>1</sup> from 2020 set out the objective to produce up to 10 million tonnes of renewable hydrogen in the EU. The REPowerEU plan<sup>2</sup> proposes to complement this goal by facilitating 10 million tonnes of renewable hydrogen imports by 2030.

The European Commission proposed a fully-fledged legislative framework for the production, consumption, infrastructure development and market rules for a future hydrogen market, as well as binding quotas for renewable hydrogen consumption in industry and transport. Whilst several legislative proposals are still in inter-institutional negotiations, it is clear that the European Union will be the world's most advanced region to set up a forward looking, predictable and comprehensive regulatory framework to promote the rapid take off of renewable and low-carbon hydrogen at continental scale. At international level, the EU is developing win-win partnerships with third countries, including through its free trade agreements and in the framework of its Global Gateway strategy, to create opportunities for hydrogen in their green energy transition as well as to support their efforts to develop local value addition.

In December 2022, a political agreement was reached on the revision of the EU ETS Directive, establishing free allowances for electrolyzers producing hydrogen, increasing the number of allowances earmarked to the Innovation Fund and enabling EU-wide auctions to be carried out under the Innovation Fund.

In parallel to the legislative progress, European industry has already developed a strong project pipeline of hydrogen projects. The European Clean Hydrogen Alliance identified 840 hydrogen projects across all parts of the value chain<sup>3</sup> and Europe is home to the world's first hydrogen-based steel production projects. 16 EU Member States adopted national hydrogen strategies, which collectively amount to 40 GW of electrolyser capacity targeted for 2030, or 5.6 million tonnes of renewable hydrogen. As regards the need for infrastructure, the first Union list of projects of common interest and of projects of mutual interest including on hydrogen and electrolyzers is under preparation through the implementation of the trans-European energy networks policy<sup>4</sup>.

Europe is also a global leader in the manufacturing of electrolyzers, and a joint declaration<sup>5</sup> to scale up electrolyser manufacturing capacity testifies to EU industry's readiness to deliver. These competitive advantages and the early development of regulatory frameworks have led to

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<sup>1</sup> [COM/2020/301 final](#)

<sup>2</sup> [COM/2022/230 final](#)

<sup>3</sup> [https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance/project-pipeline\\_en](https://single-market-economy.ec.europa.eu/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance/project-pipeline_en)

<sup>4</sup> [https://energy.ec.europa.eu/consultations/consultation-list-candidate-projects-common-interest-all-infrastructure-categories\\_en](https://energy.ec.europa.eu/consultations/consultation-list-candidate-projects-common-interest-all-infrastructure-categories_en)

<sup>5</sup> <https://ec.europa.eu/docsroom/documents/50357>

many hydrogen project developers planning investments in Europe. Today Europe hosts over 30% of proposed hydrogen investments globally<sup>6</sup>.

The first final investment decisions (FIDs) took place in 2022. However, a vast majority of hydrogen investments in Europe are still at the planning stage. For investments to be unlocked on production side, more demand visibility is needed. Hydrogen production via electrolysis is currently hardly produced at scale and is not competitive with conventional hydrogen. Internationally, the International Energy Agency (IEA) estimates<sup>7</sup> that 2.4 million tonnes per year of export-oriented renewable and low-carbon hydrogen projects will come online and around 10 million tonnes per year by 2030<sup>8</sup>. According to the IEA, only 0.9 million tonnes per year are designated for export to the European Union so far.

In her State of the European Union address on 14 September Commission President von der Leyen announced the establishment of the European Hydrogen Bank<sup>9</sup>. The objective of the Bank is to close the investment gap and connect future supply of renewable hydrogen with our demand objective of 20 million tonnes of renewable hydrogen. The European Hydrogen Bank will facilitate both renewable hydrogen production within the EU and imports, contributing to the RepowerEU objectives and to the transition to climate-neutrality.

The Hydrogen Bank supports the objectives of the Green Deal Industrial Plan<sup>10</sup> and the Net-Zero Industry Act. The scaling up of electrolyser manufacturing for renewable hydrogen production will contribute to the competitiveness and resilience of European industry, including steel and fertiliser production<sup>11</sup> and shipping industry. Scaling up the European hydrogen market will also allow European companies to play a leading role in the emerging global hydrogen market, which offers new growth opportunities and quality job creation. This Hydrogen Bank Communication accompanies a legislative proposal for a Net-Zero Industrial Act.

The European Hydrogen Bank will be an instrument implemented by the European Commission, consisting of two new financing mechanisms to support renewable hydrogen production within the EU and internationally. It will also provide increased transparency on hydrogen demand, supply, flows and prices and play a coordination role and facilitate blending with the existing financial instruments to support hydrogen projects.

For the European Hydrogen Bank to be successful, the regulatory framework for the production and consumption of hydrogen must be finalised as a matter of priority. The Commission therefore calls on the European Parliament and the Council to facilitate a swift entry into force

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<sup>6</sup> Hydrogen Council (2022) Hydrogen Insights 2022.

<sup>7</sup> International Energy Agency: Global Hydrogen Review 2022.

<sup>8</sup> Excluding 2 million tonnes of cross-border trade within the EU.

<sup>9</sup> [https://ec.europa.eu/commission/presscorner/detail/en/speech\\_22\\_5493](https://ec.europa.eu/commission/presscorner/detail/en/speech_22_5493)

<sup>10</sup> [COM\(2023\) 62 final](#)

<sup>11</sup> Commission Communication: Ensuring availability and affordability of fertilisers, COM/2022/590 final/2

of the delegated acts clarifying how hydrogen and hydrogen-based fuels can qualify as renewable and to conclude negotiations and to swiftly adopt the proposed Renewable Energy Directive and the future rules for efficient hydrogen markets, including the definition for low-carbon hydrogen<sup>12</sup>.

While the Commission is mobilising all efforts to increase the ramp-up of renewable hydrogen, RePowerEU also acknowledged that other forms of fossil-free hydrogen, notably nuclear-based, play a role in substituting natural gas. Compliance with the Water Framework Directive is of key importance to address the additional fresh water needs at those locations where the roll-out of additional renewable and low-carbon hydrogen production capacities takes place.

### **Financing needs**

The European hydrogen market faces four investment challenges: scaling up manufacturing capacities for electrolyzers, scaling up new hydrogen production capabilities, opening new demand sectors for renewable and low-carbon hydrogen and developing dedicated hydrogen infrastructure. This also requires additional skilled workers, calling for significant investment in re-skilling and upskilling the needed workforce<sup>13</sup>.

Today, around 8 million tonnes of hydrogen are consumed within the EU, primarily produced from natural gas<sup>14</sup>. Currently, less than 0.3 million tonnes of electricity-based hydrogen are produced in the EU. Around 160 MW electrolyser output capacity<sup>15</sup> is currently installed within the EU, whilst a production target of 10 million tonnes of renewable hydrogen would require between 80-100 GW. This will require roughly 150-210 GW of additional renewable capacity generating electricity at low cost to make renewable hydrogen competitive with its fossil alternatives.

All in all, the total investment needs to produce, transport and consume 10 million tonnes of renewable hydrogen are expected to be in the range of EUR 335-471 billion, with EUR 200-300 billion needed for additional renewable electricity production. The investments for key hydrogen infrastructure categories by 2030 are estimated at EUR 50-75 billion for electrolyzers, EUR 28-38 billion for EU-internal pipelines and EUR 6-11 billion for storage. The upscaling of the electrolyser manufacturing capacities will require investments estimated at maximum EUR 1.2 billion. An additional EUR 500 billion of investments will be needed in international value chains to enable the import of 10 million tonnes of renewable hydrogen, including in the form of derivatives.

The bulk of the investment in the hydrogen sector will have to be covered by private capital. The climate taxonomy delegated act already channels private funding to activities related to

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<sup>12</sup> [COM\(2021\) 803 final](#); [COM\(2021\) 804 final](#)

<sup>13</sup> As identified in the European Hydrogen Skills Alliance “Green skills for hydrogen” initiative <https://greenskillsforhydrogen.eu/>

<sup>14</sup> Without CCS

<sup>15</sup> Throughout the document, electrolyser capacity refers to output, i.e. the hydrogen production capacity

manufacturing of equipment for the production and use of hydrogen, the production of hydrogen and its storage.

At the same time, all relevant EU funds are being mobilised to support an accelerated scale-up of the hydrogen market in Europe. To support the scale-up of electrolyzers, Horizon 2020 supported the development of the first 100 MW scale electrolyzers, complementing the research and demonstration projects financed under the Clean Hydrogen Joint Undertaking. To support bringing hydrogen technology to the market, eight large scale projects have been awarded by the EU ETS Innovation Fund for hydrogen production or consumption. The full project pipeline of the Innovation Fund seen under the 2021 large-scale call would lead to construction of some 2.6 GW of electrolyser capacity. In addition, the 2022 Large Scale call for proposal closing on 16 March dedicates a EUR 1 billion call to hydrogen and industry electrification as well as EUR 700 million to clean tech manufacturing, including electrolyzers.

State-aid financing was approved for two rounds of Important Projects of Common European Interest (IPCEIs) to support the production and use of renewable and electricity-based hydrogen for a total amount of EUR 10.6 billion in funding, expected to unlock an additional EUR 15.8 billion in private investments. In addition, several Member States are setting-up competitive bidding schemes to enable renewable hydrogen projects to be developed at least cost. Over EUR 10 billion have been assigned under the Recovery and Resilience Plans, with EUR 4.9 billion going through IPCEIs. As regards infrastructure, the Connecting Europe Facility for Energy has a remaining budget of EUR 3.3 billion to support selected energy infrastructure categories, such as hydrogen, up to 2027.

Cohesion policy funding, especially through the European Regional Development Fund (ERDF) and the Just Transition Fund (JTF), as well as the InvestEU Fund will also provide significant support to Member States and regions for their investments across the whole hydrogen supply chain, from the innovation to the piloting and initial deployment aspects. Under InvestEU such investments may be financed for example under the EIB's Thematic Green Transition Financial Product or by other Implementing Partners like the European Bank of Reconstruction and Development or the Nordic Investment Bank. The InvestEU provides a flexible framework for efficient top-ups or blending with other EU Instruments such as the Innovation Fund. Finally, the Joint undertaking on Clean Hydrogen is investing in increasing efficiency and reducing the cost of producing, storing and distributing renewable hydrogen, to make it more competitive with the hydrogen produced from fossil fuel and to accelerate its replacement by renewable hydrogen.

Also, the European Investment Bank (EIB), as the EU's climate bank, has committed to exceed 50% of its overall lending by 2025 for climate action and environmental sustainability, including through its own resources. In the past decade, the EIB has provided over EUR 1 billion in financing directly linked to hydrogen projects. This was recently complemented by EIB's REPowerEU EUR 30 billion package which aims to mobilise up to EUR 115 billion by 2027 of investments leading to decarbonisation of the EU industry.

However, there remains a green premium in terms of higher costs for those off-takers willing to choose hydrogen over fossil fuels. Targeted use of public resources to finance the green

premium can leverage private sector investments by de-risking renewable hydrogen production. Estimates suggest that hydrogen imports by ship (where hydrogen needs to be imported in the form of ammonia, methanol, liquid organic hydrogen carriers or e-fuels) would require a market premium in the order of EUR 3-5/kg (including transport, storage and delivery to the end-consumer). Since renewable hydrogen is not available on the global market yet, this means that the green premium will need to be used to secure production capacity. A budget of EUR 1 billion is estimated to enable 0.04-0.06 million tonnes of renewable hydrogen production capacity per year. After 2025, the market premium is expected to decline due to decreasing production costs and increased demand for green products produced with renewable hydrogen. Furthermore, the EU Emissions Trading Scheme and the proposed European Taxation Directive will make renewable and low-carbon hydrogen more attractive compared to its fossil fuel alternative.

Based on the expected decline in production costs and the increasing demand for renewable hydrogen, estimates suggest a total green premium of around EUR 90-115 billion for both the domestic production and import of a total of 20 million tonnes of renewable hydrogen. The sooner the production of renewable hydrogen is scaled up, the smaller this green premium is likely to be.

In the short term, to strengthen efforts at EU level to deploy hydrogen and support the scaling up of the manufacturing of other strategic net-zero technologies, additional resources will be required at EU level. The Innovation Fund's legal basis, in particular the new provisions for EU-level competitive bidding auctions, provide a very promising and cost efficient avenue to support the scaling up of manufacturing and deployment of renewable hydrogen and other strategic net-zero technologies in Europe, and thus reinforcing Europe's sovereignty in the key technologies for climate action and energy security. The Net-Zero Industry Act provides a first basis for organising strategic projects. There is a large scope for increasing the financial leverage of the Innovation Fund, also taking into account the higher ETS revenues and the agreement on the ETS Directive that Member States shall invest all their ETS revenues in climate and energy objectives. We will consider this when designing the Sovereignty Fund in the context of the mid-term MFF review.

## **2. THE EUROPEAN HYDROGEN BANK – CONCEPT, TASKS AND STRUCTURE**

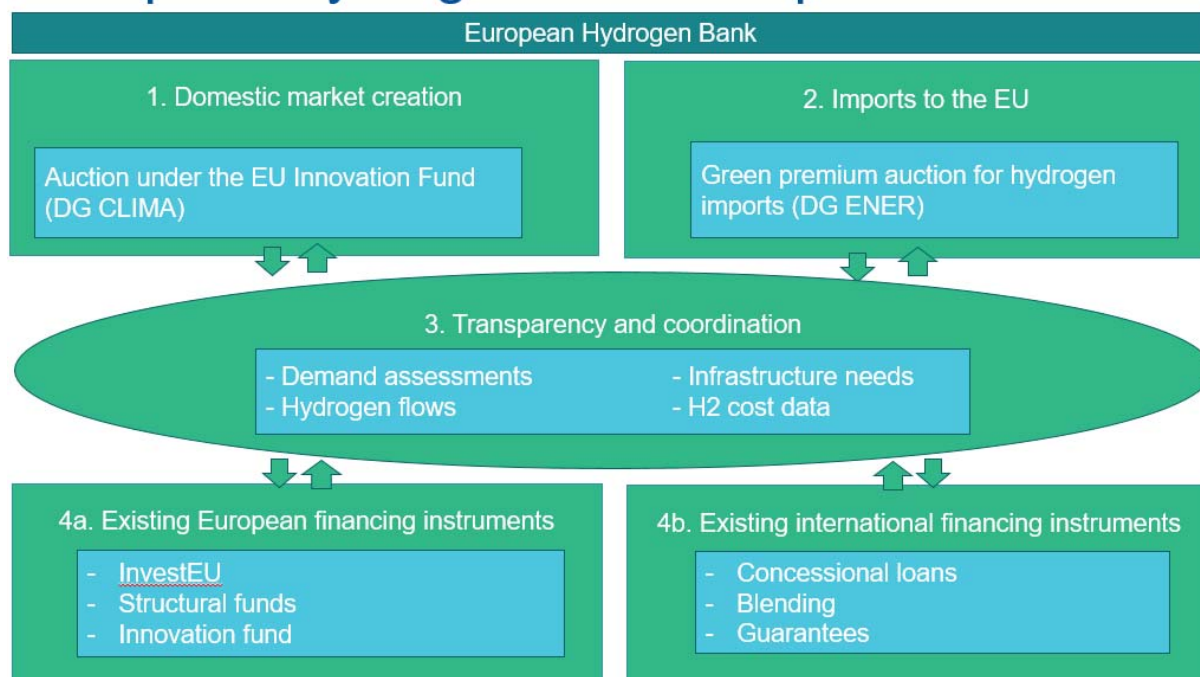
The European Hydrogen Bank aims to unlock private investments in hydrogen value chains in the EU and in third countries by connecting renewable hydrogen supply with the emerging demand by European off-takers and thus to establish an initial market for renewable hydrogen. The Bank will promote the production of renewable hydrogen domestically as well as imports from international producers to European consumers.

In the absence of a sufficient green market premium for early projects, the strategy behind the European Hydrogen Bank is to cover and, eventually also to lower, the cost gap between renewable hydrogen and the fossil fuels it can replace.



The European Hydrogen Bank is based on four pillars, which will be implemented by the European Commission. It will consist of two new financing mechanisms to support renewable hydrogen production within the EU and internationally. Furthermore, the Bank provides increased demand visibility by linking with off-takers, parallel Member State initiatives and existing data centres. Finally, the Bank will also play a coordination role and facilitate blending with the existing financial instruments to support hydrogen projects (Figure 1).

## European Hydrogen Bank: Proposed activities



*Figure 1. The four pillars of activities related to the European Hydrogen Bank*

The Bank will have an important role, as it will unlock private sector investment and contribute to early market creation and price discovery by creating competition for financing, as well as increasing investor confidence and project-finance learnings in the private financing sector.

Over time, the goal of the bank is to reduce the cost gap to a level that private off-takers are willing and able to cover. The European Hydrogen Bank will operate in compliance with international commitments, at bilateral or multilateral level, both under the domestic and the international legs.

### **2.1. DOMESTIC MARKET CREATION: FIXED PREMIUM AUCTIONS TO SUPPORT EU-BASED PRODUCTION**

As announced in the Green Deal Industrial Plan and with the view to implement the domestic leg of the European Hydrogen Bank, the Commission is advancing swiftly in the design of the first pilot auctions on renewable hydrogen production. The auctions will be launched under the

Innovation Fund in the autumn 2023 under the new competitive bidding mechanism, in line with the rules set out in the financial regulation and the revised EU ETS Directive.

The auctions are being designed to achieve the following key objectives:

- Connecting EU domestic<sup>16</sup> renewable hydrogen supply and demand.
- Bridging and reducing the cost gap in the EU between renewable and fossil hydrogen as effectively as possible. Auctions have been a major success story in the power sector, bringing down the required funding for renewable power generation through competition on price.
- Allowing for price discovery and market formation in the EU: competitive auctions with a simple and transparent set-up reveal private costs, and create valuable and comparable price points that can serve to kick-start a European hydrogen market.
- De-risking European hydrogen projects, bringing capital costs down and leveraging private capital. Given the size of the investment challenge, support from the Innovation Fund should be seen as the seed funding for increased private and corporate investments.
- Ensuring a fast roll out and simple implementation, thereby significantly reducing administrative burden and costs thanks to short, lean and transparent procedures. This will support the EU to lead in the development of this new market, taking into account support mechanisms provided by third countries.

The auction design for the 2023 pilot auctions on renewable hydrogen production is being developed by the Commission with inputs from all relevant stakeholder groups: Member States, utilities, project developers, industrial and other hydrogen off-takers, banks, infrastructure funds, academia, and others. A final workshop on the terms and conditions of the full design will be held in May 2023 to ensure a precise fit of the first EU-wide auction with private sector needs and practices.

The first pilot auction will support the production of renewable hydrogen, as defined according to the final versions of Delegated Acts of the Renewable Energy Directive<sup>17</sup>. The auction will award a subsidy to hydrogen producers in the form of a fixed premium per kg of hydrogen produced for a maximum of 10 years of operation. By bridging the cost gap and increasing revenue stability, this will increase the bankability of projects and bring overall capital costs down. Payments will be based on outputs, i.e., upon delivery of certified and verified volumes of renewable hydrogen.

The indicative budget for the first auction will be EUR 800 million considering the results of market testing already performed and the need to create the right level of competition. Learning from the first pilot auction will help to size the future auction rounds.

In terms of auction design, simplicity, transparency and speed to implementation are priorities. The key design parameters of the auction being considered at this stage by the Commission are

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<sup>16</sup> Projects in Norway and Iceland are also eligible as they are eligible for Innovation Fund in general.

<sup>17</sup> Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast)



summarized in Annex I. They concern in particular the pre-qualification requirements, the bid ranking / award criteria and the pricing rules. In order to discover true costs, safeguard a level-playing field as well as to reduce complexity, the Commission also intends to exclude cumulation of support awarded through the auction with State Aid, to avoid that the same costs are covered twice and that the auction is distorted.

The Commission will further consult stakeholders on other elements such as use of bid or completion bonds<sup>18</sup> in line with the legal framework defined in the amended ETS Directive, the ceiling price and maximum realisation periods.

Following the consultation, the Commission will finalise the auction's Terms & Conditions on eligibility, auction clearing and payments (as well as termination and penalties) and publish them in summer 2023. Additional info-days on how to prepare a bid will be held in late summer 2023. This timeline allows bidders sufficient time to familiarise themselves with the auction concept and to prepare their bids. The Commission intends to delegate the execution of the full auctions project cycle to the European Climate, Infrastructure and Environment Executive Agency (CINEA).

## **2.2. EU Auction Platform: Auctions-as-a-Service for Member States**

Competitive bidding on the EU level presents a noteworthy financial innovation and could become an important tool to foster the cost-effective and early deployment of innovative renewable and low-carbon solutions. As new markets form, it is important to prevent market fragmentation between EU Member States. Although the Hydrogen Delegated Acts<sup>19</sup> will provide a uniform basis for the certification of renewable hydrogen across Europe, support schemes and the fiscal space to provide those can vary significantly between Member States. Price signals that are based on different support schemes can become impossible to compare, delaying the formation of a European hydrogen market.

In order to prevent fragmentation at the early stage of hydrogen market formation in Europe, and to save administrative costs in developing a number of different hydrogen support schemes by different Member States, the Commission proposes to extend the Innovation Fund auctions as a platform to Member States, without prejudice to EU State aid rules. This would enable Member States to use own resources for projects on their territory by relying on an EU-wide auction mechanism.

By offering an “auctions-as-a-service”, the Commission would run a single auction. The supply curve of projects would first clear the Innovation Fund budget, independently of where projects come from. After the Innovation Fund budget is exhausted, the remainder of the supply curve could be supported by Member States, following the ranking of the EU auction platform, until

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<sup>18</sup> Bid completion bonds are in essence deposits. Those can be implemented e.g. through a bank or mother company guarantee

<sup>19</sup> [https://ec.europa.eu/commission/presscorner/api/files/document/print/en/qanda\\_23\\_595/QANDA\\_23\\_595\\_EN.pdf](https://ec.europa.eu/commission/presscorner/api/files/document/print/en/qanda_23_595/QANDA_23_595_EN.pdf)

the Member States' respective budget is exhausted without prejudice to Article 107 and 108 TFEU and provided sufficient national projects participate in relation to the respective committed national resources (see Figure 2 as an illustration on auction clearing). Member States would be awarding and executing payments for those additional projects. Any measure that constitutes State Aid, unless block exempted, is subject to the notification obligation. The Commission will verify and – if necessary – ensure that there is sufficient competition in the allocation of Member States' contributions to the auction.

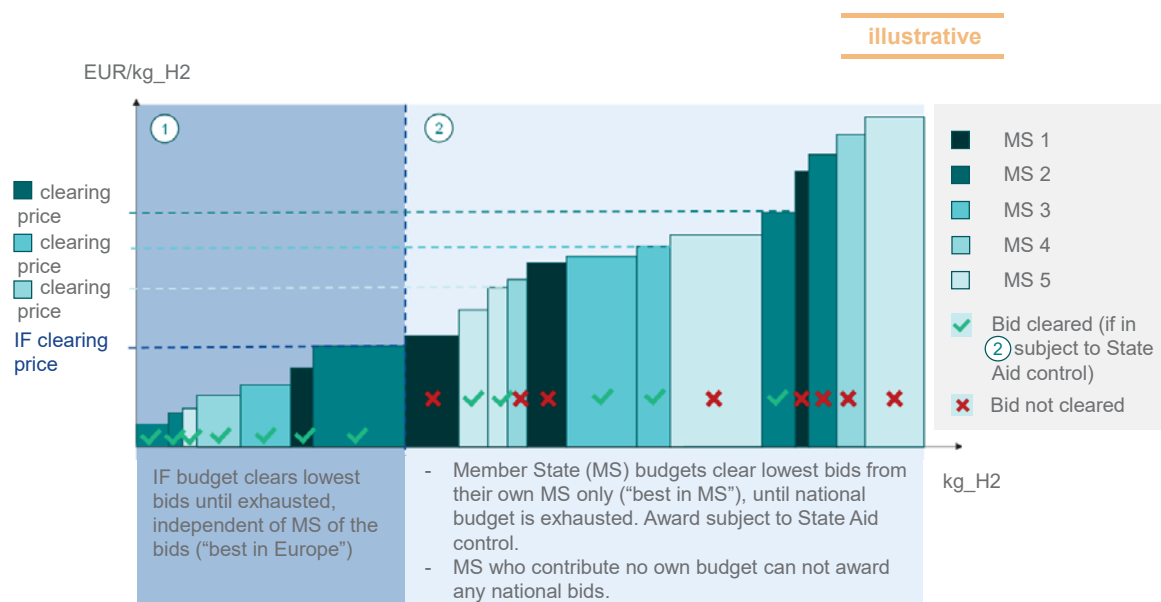


Figure 2. Illustrative design for the development of a EU Auction Platform pooling Member State financing.

If successful, the concept laid out in the preceding paragraph could be extended beyond hydrogen production to auctions in other areas such as Carbon Contracts for Difference for industry decarbonisation, in line with the legal framework defined in the amended ETS Directive. The concept to pull in EU Member State resources to organise European-wide auctions could also be considered to support international auctions for renewable hydrogen. These possible extensions of the EU auction platform would similarly be subject to State Aid rules.

### 2.3 SUPPORTING INTERNATIONAL HYDROGEN PRODUCTION

The EU is strongly committed to international cooperation to accelerate the green transition, including hydrogen market development in the EU and globally. In this context, the development of renewable hydrogen economies in EU Partner countries will help accelerate their transition towards climate neutrality and contribute to broader social and economic development. Investments in renewable energy and hydrogen can also improve the attractiveness of investments in countries with high investment costs, low share of renewables and underdeveloped energy infrastructure and create export diversification opportunities. In parallel, attention will also need to be paid to the sustainability of renewable hydrogen

production, avoiding increasing water stress and potentially negative impact to accessibility to electricity and water<sup>20</sup>. Domestic decarbonisation efforts in partner countries will be additionally supported by the recent agreement between the co-legislators on a future Carbon Border Adjustment Mechanism (CBAM), which includes imports of hydrogen within the scope of the mechanism. From 2026, imports of hydrogen into the EU will be subject to an adjustment based on their carbon content.

The REPowerEU Communication proposes to import 10 million tonnes of renewable hydrogen by 2030, on top of the 10 million tonnes of renewable hydrogen production in the EU, making the EU the largest aspiring renewable hydrogen market in the world. The majority of export projects plan to deliver hydrogen and its derivatives via ship, creating a need for expanded shipping and port infrastructure in Europe. International hydrogen trade through pipelines is expected to occur nearer to the end of this decade<sup>21</sup>.

Early market analysis and stakeholder feedback suggest that there is a need for a dedicated instrument that can support hydrogen flows from third countries. In the absence of a market, there is a role for EU Member States to support European off-takers to enable the still missing off-take agreements with producers in third countries. This instrument should work hand in hand with energy diplomacy and trade policy efforts to ensure that the EU does not create new strategic dependencies.

Integration of the Sustainable Development Goals in the design of the EU support for imported renewable hydrogen would provide access to the European market and promote sustainability of local production and consumption of renewable electricity and hydrogen, as well as social, economic and environmental needs, for the benefit of the EU partner countries and their citizens.

Several Member States have developed strategies to support the import of hydrogen from third countries. Therefore, the Commission is further exploring how to design the international leg of the European Hydrogen Bank to promote a coordinated EU strategy for renewable hydrogen imports. The intention also here is to cover the cost gap between renewable hydrogen produced in third countries and transported to the EU and the fossil fuels it can replace within the EU.

The Commission will continue to explore possible sources of funding within EU budget or in partnership with the EIB to finance the green premium, taking into account that the current Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI-GE) cannot be used for paying for commodities used in the EU, thus for green premiums to producers of renewable hydrogen in third countries.

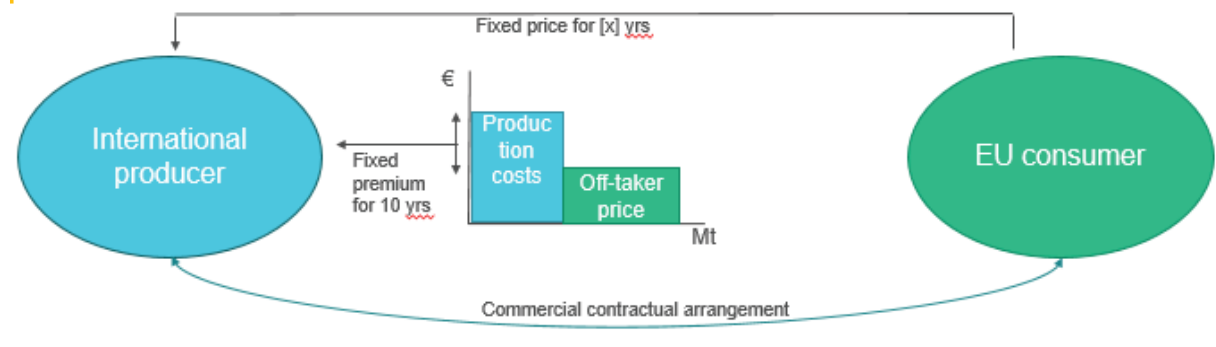
Regarding the specific design of the auctions, the Commission is assessing the feasibility of creating a similar scheme of green premium for which suppliers from third countries or EU off-

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<sup>20</sup> The new demand would need to be strongly framed in a water resilience policy, which is the agenda that the Commission is advocating at the upcoming UN Water Conference in New York.

<sup>21</sup> Hydrogen Council: Global Hydrogen Flows. Hydrogen trade as a key enabler for efficient decarbonisation, October 2022.

takers contracting with third country producers can apply (see Figure 3). The operation, design and institutional set-up of the support scheme for renewable hydrogen imports could mirror fixed premium auctions, which are proposed for EU-based production of renewable hydrogen. A symmetric approach for international and domestic production could allow for timely and cost-effective implementation profiting from operational and institutional synergies and the use of existing structures, such as CINEA.



*Figure 3. Conceptual design for a fixed premium auction for international suppliers to EU consumers.*

In light of the progress made, the Commission will explore by the end of the year a Team Europe initiative to pool Member State resources and to facilitate synergies with existing EU funds and the Global Gateway Strategy. To that end, the Commission will study the possibility to include a mechanism for demand aggregation and joint auctioning of renewable hydrogen in the future within the scope of activities of the European Hydrogen Bank, using the experience gained under the EU Energy Platform and AggregateEU and subject to EU competition and State Aid rules.

At the same time, the different risk profiles for supporting renewable hydrogen production facilities outside of the EU have to be considered, taking into account the overall regulatory and investment framework in the country concerned, as well as any geopolitical risks and the degree of commitments taken by the country towards the EU.

This will impact the design options. Stability, predictability and reliability of the enabling framework for additional renewable energy and hydrogen projects in a specific potential supplier country is a key factor for future hydrogen consumers taking large scale investment decisions and securing long-term financing today. Geopolitical risks related to economic relations and trade, as well as social- and environmental policy in third countries are of particular importance for ensuring security of hydrogen supply, sustainability and the EU development policy coherence.

Over time, the initial concept of green premium auctions could be extended to further reduce the risk stemming from the uncertainty of off-take agreements by establishing an intermediary executing double-sided auctions. Such an intermediary would sign agreements both with the producer and the off-taker. Such an approach is already implemented through the German H2Global foundation.

The EU will continue to support partner countries in accelerating their green energy transition through, inter alia, technical assistance and support to establishing a conducive governance, legislative and business environment, as well as mobilising investment needed in renewable energy and energy efficiency. The NDICI-GE and IPA III instruments, including European Fund for Sustainable Development Plus (EFSD+), will remain instrumental in this regard, in line with existing NDICI-GE and IPA III regulations and practice.

## **2.4 COORDINATION AND TRANSPARENCY**

Through its activities, the European Hydrogen Bank will increase transparency on hydrogen flows, transactions and prices. More specifically, the Commission will coordinate such information to strengthen confidence in the developing hydrogen market. The Commission can also use information gathered from European and international off-take agreements to provide transparent price information and develop price benchmarks.

There is a growing amount of information available on renewable hydrogen demand and supply in the EU and worldwide. The Bank will provide added value by bringing together and complementing such information, building on existing sources and structures, e.g., information available via the Commission, especially the development of data collection on hydrogen led by Eurostat<sup>22</sup>, via Commission led initiatives such as the European Clean Hydrogen Alliance, Renewable and Low-Carbon Fuels Alliance and Zero Emission Aviation Alliance, via existing project financing mechanisms<sup>23</sup> and industry monitoring. Furthermore, the Bank will benefit from the Fuel Cells and Hydrogen Observatory under the Clean Hydrogen Joint Undertaking, which already provides a public portal for European Hydrogen data. In addition, the Bank will liaise for information with the IEA and IRENA. The Bank will be well placed to assess EU demand for domestic and imported renewable hydrogen, e.g., by organising a “call for interest” as a voluntary, non-binding expression of interest by EU off-takers.

The rapid development of dedicated hydrogen infrastructure in and to the EU connecting supply and demand is crucial to reach our decarbonisation objectives. The revised TEN-E Regulation is a unique instrument for European energy infrastructure planning. The European Hydrogen Bank will support infrastructure planning with information on hydrogen flows it will gather through its activities (e.g., information on delivery points).

The Bank will also support the coordination of both Member State and company level Memoranda of Understanding with third countries and foreign hydrogen producers and provide support for the establishment of dedicated provisions within the Energy and Raw Materials

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<sup>22</sup> The European Commission (Eurostat) is leading the development of the data collection for hydrogen and is guiding the harmonization in methodology with partners such as the IEA and APEC, to ensure the comparability of data at international level. Data will be collected from Member States from reporting year 2022 on a voluntary basis and from reporting year 2024 on a mandatory basis. Data will cover a wide spectrum of areas including production, trade, transformation, storage and final consumption.

<sup>23</sup> This can include information via RRF, InvestEU, Innovation Fund, Cohesion policy funds, EFSD+

trade chapters in free trade agreements, or sustainable investment facilitation agreements (SIFA).

Green Hydrogen Partnerships and Memoranda of Understanding (MoUs) signed by the European Commission, Member States and European companies, including ports, can provide information on potential hydrogen flows from third countries which, coordinated by the European Hydrogen Bank, will provide visibility on where and when hydrogen infrastructure will be necessary.

On behalf of the EU, the European Commission has signed MoUs and/or Partnerships with Egypt, Japan, Kazakhstan, Morocco, Namibia and Ukraine. Dedicated provisions on hydrogen cooperation have also been included in the modernised EU-Chile Association Agreement and are considered in ongoing negotiations for free trade agreements with India and Australia. Cooperation under these MoUs/Partnerships and Free Trade Agreements aim to support the green transition in partner countries, including through the development of the renewable energy sector and industrial supply chains, as well as to strengthen the regulatory and investment framework, technology deployment and sustainable production of renewable hydrogen. In these MoUs both sides recognise the natural resources constraints and express political commitment to environmental, social and economic sustainability standards. Diplomatic outreach is also ongoing with the Kingdom of Saudi Arabia with a view to establishing a partnership on hydrogen.

The modernised EU-Chile Association Agreement is the first such agreement which provides dedicated attention to hydrogen, considering the significant potential of Chile for hydrogen exports to the EU and the on-going cooperation project enabled through a Team Europe approach. The EU is leading the work also in international fora such as in the framework of the Clean Energy Ministerial Hydrogen Initiative, Mission Innovation on clean hydrogen and the International Partnership for Hydrogen in the Economy.

Publicly available information indicates that in 2021-2022 EU Member States and companies have signed hydrogen cooperation MoUs with at least 30 countries around the world. To explore synergies between multiple bilateral initiatives, the European Hydrogen Bank could enhance transparency and coordination of renewable hydrogen transactions and negotiations within the EU and with third countries as it is important for increasing efficiency and reducing efforts needed on both sides, i.e., in the EU and in partner countries.

To ensure diversification of renewable hydrogen sources over time, the Commission is exploring the option of an instrument inspired by the transparency provisions of the EU Energy Platform<sup>24</sup> under Council Regulation (EU) 2022/2576<sup>25</sup>. It could be a positive contribution to the incipient renewable hydrogen market to provide intelligence, and possibly provide the

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<sup>24</sup> [https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform\\_en](https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform_en)

<sup>25</sup> [COUNCIL REGULATION \(EU\) 2022/2576](#) of 19 December 2022 enhancing solidarity through better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders



Commission the possibility to issue recommendations on coordination of hydrogen investments.

## **2.5 COORDINATION OF EXISTING PROJECT FINANCING**

Several financing instruments exist at EU and Member State level to support hydrogen project development. The Hydrogen Public Funding Compass of the European Clean Hydrogen Alliance helps to navigate interested stakeholders through the project financing programmes in the EU, including at Member State level.

At EU level, there are the InvestEU and cohesion policy programmes, that, through risk-sharing and blending operations, can mobilise financing for investments in hydrogen projects, as well as direct project support through the EU ETS Innovation Fund, support for Hydrogen Valleys and for other parts of the hydrogen value chain under Horizon Europe, the European Regional Development Fund and the Connecting Europe Facility. Under the Connecting Europe Facility for Transport, the Commission has established the Alternative Fuel Infrastructure Facility (AFIF), which provides EUR 1.5 billion grant support (combined with financial support from financial institutions to achieve a higher impact) for the deployment of alternative fuel supply infrastructure for all transport modes, such as hydrogen fuelling stations. Several national instruments exist, notably the funding of IPCEI hydrogen projects, instruments included in the Recovery and Resilience Plans (RRPs) and further hydrogen national support schemes under the General Block Exemption Regulation, as well as measures that can be approved by the Commission if they fulfil the conditions set out in the Climate, Environmental protection and Energy Aid Guidelines, the Research, Development and Innovation Framework or the Temporary Crisis and Transition Framework.

Improvement of cross-sectoral hydrogen knowledge sharing and awareness of support measures under the various support- and financing instruments of the EU and the Member States is one of the areas under exploration for the activities of the European Hydrogen Bank aiming to increase transparency and effectiveness of cooperation at institutional level. It can support the cooperation and coordination where hydrogen knowledge is not the core-competence of experts involved in implementation and planning. The Commission should streamline the support these instruments provide, especially to ensure that they can mutually reinforce each other and facilitate a cost-efficient use of these resources. The Commission will seek to exchange information and coordinate with Member States on their plans for hydrogen project financing and is exploring the possibility of pooling Member State resources and of increasing efforts at EU level to also allow Member States with more limited resources to benefit from the European scale and to make a greater impact by establishing a common market for hydrogen.

To save resources and efforts, the full potential of the existing information sharing- and communication channels are intended to be explored and used, including the existing institutional networks and industry platforms, including Clean Hydrogen Alliance, Hydrogen Energy Network, and EU funding information platforms.

Global Gateway is the framework under which the EU supports investments in renewable hydrogen in partner countries as part of their green transition. Grants and guarantees of the European Fund for Sustainable Development Plus (EFSD+) under the Neighbourhood, Development and International Cooperation Instrument<sup>26</sup> – Global Europe (NDICI-GE or Instrument) play a key role in supporting investments, in particular projects co-financed by the EIB and EU Member States' development financing institutions as Team Europe. One of the key pre-conditions for receiving NDICI-GE support is project contribution to the domestic green transition, including through, e.g., renewable energy production and use, as well as sustainability and efficient use of resources for renewable hydrogen production, including water availability, accessibility and management. Global Gateway actively seeks to mobilise private sector finance and expertise and support access to sustainable finance.

Team Europe Initiatives have been developed jointly by the EU and Member States bundling their efforts in fostering development of renewable hydrogen projects in third countries. For example, the Team Europe Initiative on Green Hydrogen (GH2) development in Chile brings together the EU, EIB and 8 EU Member States sharing an interest in supporting the development of the enabling framework, technology, human capital and in renewable hydrogen project financing for both domestic use and exports. Furthermore, a renewable hydrogen Global Gateway project is being prepared in Namibia.

However, stakeholder feedback confirms the need for additional measures to reduce the very high costs associated to the risks that are not sufficiently addressed by EU financial instruments. Enhanced coordination of the EU and EU Member State financial tools, as well as reduction of hydrogen supply- and offtake uncertainties can effectively increase the economic feasibility and bankability of investments of both, the off-taker in the EU and the producer in a third country. It is particularly important for investment- and energy intensive sectors with tight revenue margins in the market.

In the energy sector, EU financing in non-EU countries aims to support energy transition in partner countries, including by promoting renewable energy deployment, attracting public and private investment and creating business opportunities and quality jobs. This can include support for the development of local and global hydrogen markets in partner countries and regions, such funding being already within the mandate of NDICI-GE. In addition to support to international platforms, such as Mission Innovation and the Clean Energy Ministerial Hydrogen Initiative, EU research and innovation projects bring together partners from the EU and non-EU countries to work together. For example, the EU/African Union cooperative project (LEAP-RE) of Horizon Europe requires each consortium to involve at least four countries from the two continents, with at least 2 consortia members from the EU countries and at least 2 from African countries.

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<sup>26</sup> Regulation (EU) 2021/947 of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe, OJ L 209/1, 14.6.2021

The ongoing and planned EU technical assistance is necessary for the development of the policy, regulatory and investment framework in EU Partner countries, including for development of renewable energy policies, hydrogen strategies and feasibility studies.

Investment support through the EFSD+ blending and guarantees operations helps to reduce the financial costs by lowering investment costs or reducing investment risks. Technical and investment support also improves the access to project financing of the EIB and the national development financing institutions of Member States as the EU grants, EFSD+ guarantees and Team Europe Initiatives improve the bankability of projects and the trust of public investors.

Finally, the Commission supports Member States through the Technical Support Instrument<sup>27</sup> with tailor-made expertise to design and implement reforms, including those promoting investments in accelerating the green energy transition through hydrogen. The technical support, for example, involves strengthening administrative capacity, harmonising legislative frameworks, and sharing good practices.

### **3. CONCLUSION**

The proposed European Hydrogen Bank complements the EU's regulatory and supportive framework for establishing a full hydrogen value chain in Europe and supports the Net-Zero Industry Act. It will pro-actively support those industrial stakeholders that make early decisions to redirect or to focus on clean tech deployment and set the stage for the required human capital investments. It will not only support the development of electrolyser manufacturing but will also help industrial actors downstream to invest in new clean industrial processes or transport technologies that run on renewable hydrogen instead of fossil fuels.

Based on this communication, the Commission intends to operationalise all four pillars of the European Hydrogen Bank by the end of the year. In this period, it will further refine the design, activities and institutional set-up of the European Hydrogen Bank, in continued dialogue with Member States and stakeholders.

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<sup>27</sup> Regulation (EU) 2021/240 of the European Parliament and of the Council of 10 February 2021 establishing a Technical Support Instrument (OJ L 57, 18.2.2021, p.1).

## ANNEX I

The currently envisaged auction design includes the following elements:

<b>High-level Auction Design Parameters</b>	
<b>Auctioned Good</b>	Renewable Hydrogen as defined in the DA of REDII
<b>Constraining Value for auction clearing</b>	Innovation Fund budget allocated to the respective auction. Indicative budget for the first auction in 2023: EUR 800mn
<b>Remuneration Form</b>	Fixed Premium (bids in EUR/kg of H <sub>2</sub> ),
<b>Remuneration Type</b>	Output-based support. Payments on delivery of verified and certified volumes. No payments before Entry into Operation (as opposed to regular Innovation Fund grants)
<b>Bid ranking / award criteria</b>	Price-only (single-criteria auction)
<b>Support duration</b>	10 years
<b>Auction type</b>	Static auction, single-stage
<b>Pricing rules</b>	pay-as-bid
<b>Minimum price</b>	None
<b>Ceiling price</b>	Disclosed ceiling price, to be determined through final consultation and market sizing
<b>Maximum realisation period</b>	To be determined through final consultation and market sizing
<b>Prequalification requirements</b>	Key permits (environmental, building), Memoranda of Understanding or Letters of Intent on PPAs for renewable power and HPAs for hydrogen offtake, general financial health and capacity checks, option of bid and/or completion bonds (instead of heavy documentary checks)
<b>Cumulation with State Aid</b>	No cumulation with State Aid for the same costs to safeguard a level playing field between Member States
<b>Termination reasons and penalties</b>	Termination reasons will include failure to enter into operation within the maximum realisation period, and significant volume under-delivery for prolonged periods.
<b>Implementing authority</b>	European Climate, Infrastructure and Environment Executive Agency (CINEA)