



## FAQs on the European Hydrogen Bank

By Dylan Marshall | April 2023

### What is the European Hydrogen Bank?

On 16 March 2023, the European Commission [proposed the foundation of a European Hydrogen Bank](#) to stimulate domestic production and importation of renewable hydrogen in the EU.<sup>1</sup> The Bank is projected to be fully operational by the end of 2023.

### What is the policy background?

The proposal of the European Hydrogen Bank follows the publication of the EU's [Green Deal Industrial Plan for the Net-Zero Age](#) on 1 February 2023, under which hydrogen was identified as one of the key priorities for the Union.<sup>2</sup> The Bank seeks to complement and financially support the EU's wider industrial policy, particularly the [Net-Zero Industry Act](#),<sup>3</sup> explored in a [recent IIEA paper](#). At a national level, to date, 16 Member States have adopted national hydrogen strategies to compliment EU-level action.<sup>4</sup>

### What is green hydrogen?

Green or renewable hydrogen does not emit any greenhouse gases. However, depending on the way it is produced, hydrogen can emit greenhouse gases over its lifecycle. To differentiate **polluting and non-polluting forms of hydrogen**, a colour-coded classification is used to indicate how it is produced. Yellow hydrogen is somewhat an outlier as it can potentially be fossil-based or renewable, depending on the energy mix and renewable capacities of a country.

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1. COM(2023) 156 final.

2. COM(2023) 62 final.

3. COM(2023) 161 final.

4. COM(2023) 156 final, p 1. They are: Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Hungary, Italy, Luxembourg, the Netherlands, Poland, Slovakia, Portugal, Spain, and Sweden.

Each classification of hydrogen, and their relevance for the European Hydrogen Bank, is outlined in the table below:

Types of hydrogen	Production method	EU classification	Support from the European Hydrogen Bank
Green	Electrolysis using power from renewable sources	Renewable	X
Blue	Conversion of natural gas with carbon capture and storage	Low-carbon	X
Pink	Electrolysis using power from nuclear sources	Low-carbon	X <sup>5</sup>
Grey	Conversion of natural gas	Fossil-based	X
Black and brown	Gasification of coal	Fossil-based	X
Yellow	Electrolysis using power from the grid	Fossil-based, low-carbon, or renewable	Not yet clear <sup>6</sup>

## Which sectors can be decarbonised by the use of green hydrogen?

The importance of renewable hydrogen in achieving the EU's climate-related ambitions lies in its potential to decarbonise a range of carbon-intensive industries, such as **transport and shipping**, as well as the production of strategically important materials such as **ammonia, cement, methanol, and steel** which currently are difficult to electrify.<sup>7</sup> Already-existing **sector-specific renewable hydrogen targets** range from **5% of the transport industry** to source its energy consumption from renewable hydrogen up to **30% for the steel industry**.<sup>8</sup>

5. A political agreement on labelling pink hydrogen as renewable was reached at the March 2023 Energy Council in so far as additional amounts of renewable energy equal to that produced by nuclear power and utilised for hydrogen production is deployed elsewhere.

6. From 2038, the Renewable Energy Directive requires green hydrogen to be produced using additional amounts of renewable energy that would otherwise not be used. Prior to that, hydrogen can be produced from the grid, potentially causing the deployment of more electricity generation from fossil fuels or hydrogen production using dirty energy at times of the day with low renewable capacities. As such, there are questions as to whether yellow hydrogen may be eligible for support from the European Hydrogen Bank.

7. (2019) The Future of Hydrogen: Seizing today's opportunities. [online] International Energy Agency. Available at: [https://iea.blob.core.windows.net/assets/9e3a3493-b9a6-4b7d-b499-7ca48e357561/The\\_Future\\_of\\_Hydrogen.pdf](https://iea.blob.core.windows.net/assets/9e3a3493-b9a6-4b7d-b499-7ca48e357561/The_Future_of_Hydrogen.pdf) [Accessed 20 Apr 2023], p 17.

8. SWD (2022) 230 final, s 4.1.

## What are the EU's goals for green hydrogen?

The [RePowerEU Plan](#), which aims to reduce EU dependence on Russian fossil fuels, outlines the Union's goals for green hydrogen. The Plan has two strands, one focused on domestic production within the EU and the second on the importation of renewable hydrogen, with the overall aim to reach **20 million tonnes of renewable hydrogen in the EU by 2030**.<sup>9</sup>

First, the Commission aims to **produce 10 million tonnes of renewable hydrogen by 2030** which will constitute 42% of the EU's total industrial hydrogen use by 2030.<sup>10</sup> Currently, the EU produces approximately 8 million tonnes of hydrogen – the majority of which is grey hydrogen, with only 0.3 million tonnes being classified as renewable.<sup>11</sup> On the basis of the current 16 national strategies published by Member States, 5.6 million tonnes of renewable hydrogen are projected to be produced by 2030 – leaving a shortfall of 4.4 million tonnes vis-à-vis EU-wide targets. The Union's further commitment to **import 10 million tonnes of renewable hydrogen by 2030** reflects the aim to support the greening of Europe's industry.<sup>12</sup> At present, the EU imports effectively no renewable hydrogen as there is no international market.<sup>13</sup>



9. COM(2022) 230 final, p 7.

10. (2023) Council and Parliament reach provisional deal on renewable energy directive. [online] consilium. Available at: <https://www.consilium.europa.eu/en/press/press-releases/2023/03/30/council-and-parliament-reach-provisional-deal-on-renewable-energy-directive/> [Accessed 18 Apr 2023].

11. COM(2023) 156 final, p 3.

12. COM(2022) 230 final, p 7.

13. COM(2023) 156 final, p 5.

## What are the pillars of the European Hydrogen Bank?

The Hydrogen Bank has been identified as the “first pillar” of Europe’s hydrogen economy by Hydrogen Europe, the representative body of the continental hydrogen industry.<sup>14</sup> Mirroring this, the European Hydrogen Bank will have four pillars. Two pillars are geared towards financing, creating domestic and international markets for the production and importation of renewable hydrogen by covering the existing cost gap between green and grey hydrogen.<sup>15</sup> The third pillar is focused on governance, increasing transparency and coordination in the sector by assessing demand, infrastructure needs, hydrogen flows, and cost data.<sup>16</sup> The final pillar addresses the fragmentation of existing financial instruments by coordinating public and private funding in the EU and internationally.<sup>17</sup>

## How will the European Hydrogen Bank function?

The European Hydrogen Bank will have an endowment of €3 billion to support the EU’s developing hydrogen economy of which **€800 million** is earmarked for **the first round of auctions** to be held as early as **autumn 2023**.<sup>18</sup> These will be conducted via a single centralised platform across all Member States, offering “auctions as a service”.<sup>19</sup> 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 currently 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.

In addition to the financial aspects, the European Hydrogen Bank will seek to **facilitate market creation** through its governance role. The Bank will **link producers and consumers** by providing information on price and demand in a transparent manner to industrial actors and investors who are currently hesitant to invest in green hydrogen. Further, it will **support the creation** of so-called “**hydrogen valleys**” and **assist regulators with infrastructure planning** through information on hydrogen flows across the territory of the Union. Finally, it will **support** Member State and company-level **memoranda of understanding (MOUs)** to de-risk investment in and importation of green hydrogen.<sup>20</sup>

While auctions are set to begin in the autumn of this year, it should be noted that all areas of operation are not projected to be fully functional before the end of 2023.<sup>21</sup>

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14. Kurmayer, N. J. (2023) Brussels unveils ‘Hydrogen Bank’, with €800m initial funding. [online] EURACTIV. Available at: <https://www.euractiv.com/section/energy-environment/news/brussels-unveils-hydrogen-bank-with-e800m-initial-funding/> [Accessed 10 Apr 2023].

15. COM(2023) 156 final, pp 6-12.

16. Ibid, pp 12-13.

17. Ibid, pp 14-15.

18. Ibid, p 7.

19. Ibid, p 8.

20. Kurmayer, N. J. (2022) Brussels unveils ‘Hydrogen Bank’, with €800m initial funding. [online] EURACTIV. Available at: <https://www.euractiv.com/section/energy-environment/news/brussels-unveils-hydrogen-bank-with-e800m-initial-funding/> [Accessed 10 Apr 2023].

21. Ibid, pp 7, 16.

## How will the European Hydrogen Bank interact with existing EU financial instruments?

The European Hydrogen Bank will draw its €3 billion from the existing EU Innovation Fund, which itself draws from the European carbon market.<sup>22</sup> Prior to the proposal for the European Hydrogen Bank, the RePowerEU Plan identified several existing EU financial mechanisms from which renewable hydrogen could benefit.<sup>23</sup> The European Hydrogen Bank will seek to centralise the deployment of monies earmarked for renewable hydrogen under these various funds, although the particularities of how the proposed Bank will do this have yet to be determined.

Previous estimates from the Commission indicated that €335-€471 billion of investment will be required in order for the Union to reach its 2030 hydrogen targets, with an additional €200-€300 billion necessary for increasing the Union's renewable energy production capacity.<sup>24</sup> It is envisaged that the investment gap which remains between this €3 billion and what is needed to realise the Union's targets will be filled by the above-mentioned **existing European funding instruments**, the **European Investment Bank**, **national state aid**, and, above all, **private investments**.<sup>25</sup> Member States can set up auctions and state aid programmes at a national level that complement and mirror the criteria and system formed by the European Hydrogen Bank.<sup>26</sup> These national initiatives will be subject to EU competition and state aid rules.<sup>27</sup>



## How does this compare with the USA?

The level to which the European Hydrogen Bank will support renewable hydrogen production was not defined in the Commission's Communication, although figures €1-€4 per kilogram has been reported.<sup>28</sup> At a rate of just €1-€4 per kilogram of green hydrogen, it would cost €10-€40 billion in

22. COM(2023) 156 final, pp 6-7.

23. SWD (2022) 230 final, s 2.1.

24. COM(2023) 156 final, p 3.

25. Ibid, pp 4, 6-7, 8-9.

26. Ibid, pp 8-9.

27. Ibid, pp 8-9.

28. Kurmayer, N. J. (2023) Brussels unveils 'Hydrogen Bank', with €800m initial funding. [online] EURACTIV. Available at: <https://www.euractiv.com/section/energy-environment/news/brussels-unveils-hydrogen-bank-with-e800m-initial-funding/> [Accessed 10 Apr 2023]; Stones, J. (2023) EU Hydrogen Bank could bring renewable hydrogen costs below €1/kg. [online] ICIS. Available at: <https://www.icis.com/explore/resources/news/2023/04/05/10873154/eu-hydrogen-bank-could-bring-renewable-hydrogen-costs-below-1-kg/> [Accessed 20 Apr 2023].

supports to produce 10 million tonnes in the EU.<sup>29</sup> In the US, subsidies of up to \$3 per kilogram of renewable hydrogen are available under the Inflation Reduction Act (IRA).<sup>30</sup> Consequently, the €3 billion total budget may prove to be just a drop in the ocean of what is really needed for the realisation of the Union's renewable hydrogen targets and keeping industrial production in Europe.

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29. Kurmayer, N. J. (2023) Brussels unveils 'Hydrogen Bank', with €800m initial funding. [online] EURACTIV. Available at: <https://www.euractiv.com/section/energy-environment/news/brussels-unveils-hydrogen-bank-with-e800m-initial-funding/> [Accessed 10 Apr 2023].

30. Matthews, D. (2022) US Inflation Reduction Act could torpedo EU green hydrogen ambitions. [online] Science Business. Available at: <https://sciencebusiness.net/news/Hydrogen/US-Inflation-Reduction-Act-could-torpedo-EU-green-hydrogen-ambitions> [Accessed 10 Apr 2023].

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