



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update April 2023: European Commission

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1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

REPowerEU

The College adopted the **REPowerEU Communication on 8 March 2022**. This has two main pillars: the most immediate being to replenish EU gas stocks for the forthcoming winter, and to provide Member States with options to tackle high energy prices; and in the medium-term, to reduce dependence on Russian fossil fuel by diversifying our gas supplies, and through the green transition – renewable energy, energy efficiency and immediate energy savings to lower consumption

REPowerEU introduced a “**Hydrogen Accelerator**” de facto doubling the Hydrogen Strategy/Fitfor55 *renewable* hydrogen production in the EU from approx. 5.6m tons to 10m tons per year (2030 target), and setting the additional target of 10m tons imported hydrogen, which will in turn reduce our external dependencies on fossil fuel imports.

The Communication also sets a target of 80GW additional wind/solar power generation capacities for hydrogen production.

The Commission announced that it would:

- further develop the regulatory framework to promote a European market for hydrogen;
- support the development of a hydrogen infrastructure, including storage facilities and port infrastructures;
- assess state aid for hydrogen projects including hydrogen IPCEIs as a priority;
- frontload the EU Innovation Fund to accelerate hydrogen deployment in industrial sectors and enhance EU manufacturing capabilities of equipment such as electrolyzers;
- support pilot projects on renewable hydrogen production and transport in the EU neighbourhood starting with a Mediterranean Green Hydrogen Partnership;
- conclude Green Hydrogen Partnerships with third countries;
- with industry establish a Global European Hydrogen Facility.

EU's Renewable Energy Directive

The Council and the Parliament negotiators on 30 March 2023, reached a provisional political agreement to raise the share of renewable energy in the EU's **overall energy consumption**



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to **42.5% by 2030 with an additional 2.5% indicative top up that would allow to reach 45%**. Each member state will contribute to this common target.

Transport

The provisional agreement gives the possibility for member states to choose between:

- a binding target of 14.5% reduction of greenhouse gas intensity in transport from the use of renewables by 2030
- or a binding share of at least 29% of renewables within the final consumption of energy in the transport sector by 2030

The provisional agreement sets a binding combined sub-target of 5.5% for **advanced biofuels** (generally derived from non-food-based feedstocks) and **renewable fuels of non-biological origin** (mostly renewable hydrogen and hydrogen-based synthetic fuels) in the share of renewable energies supplied to the transport sector. Within this target, there is a minimum requirement of 1% of **renewable fuels of non-biological origin (RFNBOs)** in the share of renewable energies supplied to the transport sector in 2030.

Industry

The provisional agreement provides that industry would increase their use of renewable energy annually by 1.6%. They agreed that 42% of the **hydrogen** used in industry should come from **renewable fuels of non-biological origin (RFNBOs)** by 2030 and 60% by 2035.

The agreement introduces the possibility for member states to discount the contribution of RFNBOs in industry use by 20% under two conditions:

- if the member states' national contribution to the binding overall EU target meets their expected contribution
- the share of hydrogen from fossil fuels consumed in the member state is not more 23% in 2030 and 20% in 2035

Buildings, heating and cooling

The provisional agreement sets an indicative target of at least a 49% renewable energy share in **buildings in 2030**.

It provides for a gradual increase in renewable targets for **heating and cooling**, with a binding increase of 0.8% per year at national level until 2026 and 1.1% from 2026 to 2030. The minimum annual average rate applicable to all member states is complemented with additional indicative increases calculated specifically for each member state.

Adoption on 13 February 2023 of two Delegated Acts required under the Renewable Energy Directive.

DA on additionality:

It defines under which conditions hydrogen, hydrogen-based fuels or other energy carriers can be considered as a Renewable Fuel of Non Biological Origin (RFNBO). The Act clarifies the principle of “additionality” for hydrogen set out in the EU's Renewable Energy Directive. Electrolysers to produce hydrogen will have to be connected to new renewable electricity production. This principle aims to ensure that the generation of renewable hydrogen incentivises an increase in the volume of renewable energy available to the grid compared to what exists already. In this way, hydrogen production will be supporting decarbonisation and complementing electrification efforts, while avoiding pressure on power generation.



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The additionality principle in the Delegated Act establishes that installations generating renewable electricity must not have come into operation more than 36 months before the entry into operation of the electrolyzers that will produce the renewable hydrogen.

In order to allow the sector to adapt to the new rules, while scaling up to meet the demand, the rules will gradually become more stringent with time:

- First movers on renewable hydrogen production coming into operation before 2028, may produce renewable hydrogen from existent renewable energy plants for a transition period (until 1 January 2038). After that, the additionality rules must be complied with.
- The monthly correlation between the renewable installation and the renewable hydrogen producer will be applicable until 31 December 2029, unless Member States decide to introduce the hourly correlation already as of 1 July 2027.
- The installation generating the renewable electricity sourced by the electrolyser must be located in the same electricity bidding zone (in practice mostly the same Member State) than the electrolyser, an offshore bidding zone or an interconnected bidding zone.

The requirements for the production of renewable hydrogen will apply to both domestic producers as well as producers from third countries that want to export renewable hydrogen to the EU to count towards the EU renewables targets. A certification scheme relying on voluntary schemes will ensure that producers, whether in the EU or in third countries, can demonstrate in a simple and easy way their compliance with the EU framework and trade renewable hydrogen within the Single Market.

DA on methodology for calculation GHG emissions for RFNBOs

The second Delegated Act provides a methodology for calculating life-cycle greenhouse gas emissions for RFNBOs. The methodology takes into account greenhouse gas emissions across the full lifecycle of the fuels, including upstream emissions, emissions associated with taking electricity from the grid, from processing, and those associated with transporting these fuels to the end-consumer. The methodology also clarifies how to calculate the greenhouse gas emissions of renewable hydrogen or its derivatives in case it is co-produced in a facility that produces fossil-based fuels.

Alternative Fuel Infrastructure Regulation

On 27 March 2023, EU institutions reached a deal on the Alternative Fuels Infrastructure Regulation (AFIR).

- Article 6 of the regulation will mandate the construction of one gaseous hydrogen refuelling station (HRS) in every urban node and every 200 km on the TEN-T core network by the end of 2030.
- The stations will have a daily supply capacity of one ton/day of hydrogen at a pressure of 700 bars for all modes of road transport.
- Member States must prepare an HRS deployment plan outlining a clear indicative target for 2027 that delivers a sufficient coverage of the network with a view of meeting developing market demands.
- A revision of the regulation is foreseen for 2026 that will among others analyse the need for additional targets on the TEN-T comprehensive network and for liquid hydrogen refuelling stations.



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FuelEU Maritime

On 23 March 2023, the EU institutions reached a deal on FuelEU Maritime. During the negotiations, it was decided that:

- Ships should be required to gradually reduce their greenhouse gas emissions by 2% from 2025, 6% from 2030, 14.5% from 2035, 31 % from 2040, 62% from 2045 and 80% from 2050.
- This will apply to ships above 5000 gross tonnage, and to all energy used on board in ports of the European Union, for intra-European cabotage, as well as 50% of the energy used during journeys from or to ports located outside the EU or in the outermost regions.
- In addition, ships will be required from 2030 to use shore power in major EU ports. This obligation will also apply to all European ports from 2035, if they have an onshore power supply. Some exemptions may apply, if ships stay in port for less than two hours, use their own zero-emission technology, or make a stopover due to unforeseen circumstances or emergencies.
- Finally, a 2% target for the use of renewable fuels from 2034 by ships was decided. The measures will thus benefit from lighter conditions for icebreakers and ice-classified ships, the service of the outermost regions and the small islands very dependent on their maritime supply.

ReFuelEU Aviation

The legislative proposal aims to ensure a level playing field for sustainable air transport by periodically increasing the share of sustainable aviation fuel (SAF) to supply at Union airports starting in 2025. The EU blending mandate also contains a minimum share of synthetic aviation fuel, the most environmentally friendly aviation fuel, that increases over time. The Commission proposal fully relies on the Renewable Energy Directive (RED) to define and certify SAF.

The text also requires aircraft operators to only uptake the fuel necessary for the flight and therefore avoid unnecessary aviation fuel being uplifted ('fuel tankering') and greenhouse gas emissions related to extra weight. Finally, airports will have to ensure that their fuelling infrastructure is available and fit for SAF distribution. The objective is to incentivize investments and foster the creation of a European SAF market, eventually leading to economies of scale.

Three trilogues have been organised so far and the next one is scheduled on 25 April 2023 where co-legislators will discuss and try to close the remaining outstanding political issues, namely the scope of eligible fuels and the level of ambition.

The Hydrogen and gas markets decarbonisation package

The legislative proposals aim to create dedicated hydrogen infrastructure and a hydrogen market by applying market rules in two phases: before and after 2030. They also set rules for consumers protection and strengthen security of supply.

The proposals introduce a definition of low-carbon hydrogen (greenhouse gas savings of at least 70%) and a certification system for low-carbon hydrogen including a methodology for determining emission savings to be spelled out in a Delegated Act by the end of 2024. To promote a dedicated hydrogen infrastructure, the proposals also foresee a new governance structure in the form of the European Network of Network Operators for Hydrogen (ENNOH). The goal is to encourage investment in hydrogen infrastructure while avoiding the emergence of natural monopolies. Measures to ensure more coherent network planning for electricity, gas, and hydrogen at national level have been also proposed.



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Article by article examination started in the Council in July 2022. An orientation debate on key elements was held on 25 October at the Transport, Telecommunications and Energy (TTE) Council. An agreement of the EU Member States on a general approach was reached at the Energy Council on 28 March 2023. The Parliament adopted in its positions in plenary on 14 March 2023.

The Clean Hydrogen Alliance

Set up in July 2020, the European Clean Hydrogen Alliance is part of EU efforts to ensure industrial leadership and accelerate the decarbonisation of industry in line with its climate change objectives. The European Clean Hydrogen Alliance supports the large-scale deployment of clean hydrogen technologies by 2030 by bringing together renewable and low-carbon hydrogen production, demand in industry, mobility and other sectors, and hydrogen transmission and distribution. It aims to promote investments and stimulate the rollout of clean hydrogen production and use.

The Clean Hydrogen Alliance has now more than 1700 members. One of the main milestones is the [pipeline of investment projects to deploy hydrogen technologies](#).

The pipeline provides an overview of European hydrogen projects, helps create integrated European hydrogen value chains, and profiles projects, in particular with investors. The [Project pipeline \(europa.eu\)](#) can be searched by project archetype (type of project), project location, project promoter, or planned date of entry into operation.

Following the 2022 summer update, **the pipeline contains now 850 projects**. Projects total **a capacity of 67 GW by 2030** and are located all across Europe. Interestingly, > 75% set out to enter into operation by end of 2025

Electrolyser Declaration & Partnership

Achieving the ambitious renewable hydrogen targets will require a significant increase in installed electrolyser capacity to 90-100 GW LHV (measured in terms of hydrogen output). However, industry's capacity to manufacture electrolysers is currently estimated to be only 1.75GW LHV per year. To ramp-up electrolyser manufacturing, Commission officials and 20 European electrolyser manufacturers met in Brussels on 5 May to sign a Joint Declaration.

In the **Declaration**, the companies agreed to **a ten-fold increase in electrolyser manufacturing capacity in Europe to 17.5GW per year by 2025**.

A Partnership was established in September 2022. It involves 45 members (20 electrolyser manufacturers plus components, materials, and membrane manufacturers; research and innovation organisations; testing and certification bodies).

Two following task forces were created: (i) a task force on access to raw materials and supply chain which provided input to Commission's Critical Raw Materials Act and (ii) a task force on access to funding and financing is providing input to Commission's contracts for difference for hydrogen

Finally, a working Group on standardisation on hydrogen was created and delivered, on 2nd March 2023, the Roadmap on Hydrogen Standardisation.

[Hydrogen in the European Research Area \(ERA\)](#)

The European Research Area policy agenda includes, for the period 2022-2024, action 11 – an ERA for green transformation, which calls for accelerating R&I and improving the collaboration between private and public R&I activities in the Member States towards early market deployment of clean technology solutions. Action 11 contains three sub-actions, of



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which action 11.1 (Pilot on green hydrogen) and action 11.2 (SET Plan revamp) are relevant for hydrogen.

The ERA pilot on green hydrogen (ERA action 11.1), has seen the collaboration of 25 Member States, 5 associated countries and the European Commission, to develop a joint SRIA, which was published on 18 March 2022. As a contribution to the ERA pilot on green hydrogen, the Commission published in January 2022 the Commission Staff Working Document (SWD) titled 'Building a European Research Area for clean hydrogen - the role of EU research and innovation investments to deliver on the EU's Hydrogen Strategy'.

The revamp of the Strategic Energy Technology (SET) Plan (ERA action 11.2) is planned, as a Commission's Communication, to be adopted in June 2023. The work is co-led by DG RTD, DG ENER and the JRC. It will implement the ERA pilot on green hydrogen (ERA action 11.1) through a new Implementation working Group (IWG) on Hydrogen.

2. Hydrogen and Fuel Cell R&D Update

Launch of the 2023 Call for Proposals of Clean Hydrogen JU (January 2023)

On 17 January 2023, the Call for Proposals 2023 was launched, with a deadline for last 18 April 2023. The total budget encompassing all topics is of EUR 195 million, with four flagships projects on hydrogen production & storage and two on hydrogen valleys. Projects that demonstrate the conversion of waste into green hydrogen and the valorisation of the by-products of electrolysis contribute not only to the production of renewable hydrogen but also to the promotion of a circular economy. It is, in addition, paramount to the decarbonization of industrial areas that hydrogen can be accessed via local pipeline networks. These can, in many situations, be repurposed from already existing pipelines. Complementarily, the possibility for underground storage of large quantities of hydrogen is extremely relevant for the establishment of a well-functioning hydrogen economy, and thus justifies an increased investment in R&I. Finally, the two cross-cutting topics on Hydrogen Valleys aim to boost the creation of an EU-wide hydrogen ecosystem where it can be produced, stored, distributed, and used locally or regionally. It is our intention to double the number of these valleys by 2025.

Results of Call for Proposals 2022-1 of Clean Hydrogen JU

As a result of the Call for Proposals 2022-1 (deadline 31 May 2022), the Clean Hydrogen JU signed 27 grants, where 89% are collaborative projects funding research activities (RIA) and 26 countries taking part in the projects. The Clean Hydrogen JU contribution will be € 155 mil. The Call included 2 Flagships projects on end Use – transport pillar (Heavy duty Vehicles and Waterborne applications). For more information please refer to the Clean hydrogen JU website¹.

MoU between the Clean Hydrogen JU with the the Clean Aviation JU (March 2023)

On 23rd March 2023, the Clean Aviation Joint Undertaking and the Clean Hydrogen Joint Undertaking signed a Memorandum of Understanding to establish a strategic cooperation on research and innovation in hydrogen-powered aviation. The Memorandum's objective is to maximise synergies, strengthen cooperation and align the activities of the two Joint Undertakings.

This collaboration is based on the exchange of information concerning grants in the field of

¹ https://www.clean-hydrogen.europa.eu/apply-funding/call-proposals-0_en



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hydrogen-technologies for aviation, as well as planning and alignment of the respective Work Programmes and calls for proposals.

Clean Aviation, a founding member of the Alliance for Zero Emission Aviation (AZEA), has taken concrete steps to accelerate the development of hydrogen technologies in view of decarbonising aviation. Six of Clean Aviation's daring Call 1 projects are targeting technology maturation and demonstration to support short-range aircraft concepts adopting hydrogen as a power source for new aircraft with an entry into service as soon as 2035. As safety remains paramount the European Union Aviation Safety Agency (EASA) with whom Clean Aviation signed a Memorandum of Cooperation in 2022, is involved in supporting the definition and implementation of all hydrogen projects.

[Collaboration of Clean Hydrogen JU with the European Innovation Council and SMEs Executive Agency \(EISMEA\) \(November 2022\)](#)

On 25th November 2022, the Clean Hydrogen Joint Undertaking (JU) and the European Innovation Council and SMEs Executive Agency (EISMEA) signed a letter of intent to agree on the principles of a future collaboration on clean hydrogen. Its aim is to facilitate the knowledge exchange on grants, projects and companies working on clean hydrogen and to accelerate the market uptake of European Innovation Council (EIC) and Clean Hydrogen JU grantees through their respective calls for proposals.

The collaboration is based on the exchange of information about the beneficiaries in the field of innovative hydrogen-based technologies, sharing of mutual databases and ensuring the coordination and continuity of EU funding for hydrogen-based technologies.

EISMEA is managing the European Innovation Council (EIC), Europe's flagship innovation initiative to identify, develop and scale up deep-tech breakthrough technologies and game changing innovations. The EIC takes a pro-active approach to managing funding under the leadership of the EIC Programme Managers who develop visions for innovation and technology breakthroughs and steer portfolios of projects (including innovative hydrogen based technologies) to achieve these goals.

3. Demonstration, Deployments, and Workforce Developments Update

[Clean Hydrogen Partnership invests EUR 105.4 million for funding 9 Hydrogen Valleys across Europe](#)

The Clean Hydrogen Partnership has selected 9 Hydrogen Valley projects following its first call proposals (2022). The total funding requested for the 9 Hydrogen Valleys amounts to EUR 105.4 million. The projects will now start negotiations for their grant agreements, which are expected to be concluded before the summer. The projects focus on the production of clean hydrogen and address a variety of applications in the energy, transport, and industry sectors. It is expected that the projects will be able to mobilise investments of at least 5 times the funding provided by the EU or above EUR 0.5 billion.

Hydrogen Valleys contribute to the REPowerEU objectives by scaling up green hydrogen production, supply and consequently to meet the growing demand from industry, transport, and other sectors. The European Commission allocated to the Clean Hydrogen Partnership an additional €200 million through REPowerEU, to double the number of Hydrogen Valleys in Europe by 2025.



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H2Accelerate to deploy 150 fuel cell trucks across EU

The H2Accelerate collaboration secured funding for two of their primary initiatives: the deployment of eight heavy-duty hydrogen refuelling stations under the Connecting Europe Facility and a 150 fuel cell truck project funded by the Clean Hydrogen Partnership. These projects will enable trucks and refuelling equipment to be tested under real-world conditions and are expected to be a crucial step towards the mass commercialisation of the technology.

H2Accelerate TRUCKS project will fund the deployment of 150 fuel cell trucks across Europe by the mid-to-late 2020s, allowing development of the technology towards series manufacturing of the vehicles by the three major OEMs in the second half of the decade.

4. Events and Solicitations

Publications

Publication of the Programme Review Report for 2022² (December 2022)

The Programme Review Report 2022 is looking at the activities and results of the Clean Hydrogen JU and how they align with the strategy and objectives set out in its founding Regulation and further elaborated in the Strategic Research and Innovation Agenda.

It covers 98 projects active between January 2021 - March 2022, which have been assigned to seven thematic pillars: Hydrogen Production, Hydrogen Storage and Distribution, Hydrogen End Uses – Transport, Hydrogen End Uses – Clean Heat and Power, Cross-Cutting Issues, Hydrogen Valleys and Hydrogen Supply Chains. The report identifies numerous achievements of these projects in all areas of the hydrogen value chain.

Study on hydrogen in ports and industrial coastal areas (March 2023)³

The ‘Study on hydrogen in ports and industrial coastal areas’ comprises several phases, with this report being the first in a series of three reports that will all be released by the end of 2023.

Using a scenario-based approach, Deloitte Belgium Energy and Climate practice carried out for the Clean Hydrogen Partnership an extensive study that provides detailed outlooks of the potential hydrogen demand and supply in European ports and coastal areas in 2030, 2040 and 2050, along with the required hydrogen value chain infrastructure and a no-regrets investment roadmap for the development of hydrogen activities and infrastructure in the vicinity of ports. The report also provides an overview of the various possible roles that a port could fulfil in Europe’s future hydrogen economy.

The key message of the study is that achieving REPowerEU's ambitious targets and continuing to expand the European hydrogen market through 2050 requires accelerated investment in dedicated infrastructure in port areas to deliver hydrogen to multiple end-users in the wider port areas and/or into the hinterland.

Events & Initiatives

² https://www.clean-hydrogen.europa.eu/media/news/programme-review-report-2022-now-available-2022-12-16_en

³ https://www.clean-hydrogen.europa.eu/media/news/press-release-study-hydrogen-ports-and-industrial-coastal-areas-2023-03-30_en



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Hydrogen Valley workshops + Joint Declaration (January-March 2023)

The upcoming EU Roadmap for Hydrogen Valleys kickstarted last January 27. Representatives from partnerships, financial institutions, and governmental associations and the private sector were invited by DG R&I to speak on the challenges and opportunities for the deployment of hydrogen valleys across Europe. Complementarily, online participants gathered in breakout rooms to debate and discuss their local and national realities. This workshop was the first of two, as it was followed by another one taking place on 28 February and 1 March. Co-organized by the Clean Hydrogen Joint Undertaking, European Hydrogen Valleys Partnership and the Northern Netherlands region, it gathered regional actors of the European Hydrogen Valleys to discuss the roll-out and scale-up of an increasing number of projects (leading to the objective of doubling the number of hydrogen valleys in the EU by 2025).

Finally, both of these workshops led to the signature of the **Joint Declaration on “Hydrogen Valleys: Moving the hydrogen economy from niche to scale”** on March 1. The ceremony took place at the Autoworld, in Brussels, and counted with the presence of Commissioner Mariya Gabriel who signed on behalf of the European Commission. The other signatories were Hydrogen Europe, Hydrogen Europe Research and the S3 Hydrogen Valleys Platform. This constitutes an important landmark in upholding cooperation and synergies across stakeholders to make a functioning European Hydrogen economy a reality.

New website for the European Hydrogen Refueling Station Availability System

The European Hydrogen Refuelling Station Availability System (E-HRS-AS) provides a free, reliable and ready to use data service on hydrogen refuelling stations (HRS) in Europe. The recently launched website includes a real-time information system on the availability of hydrogen refuelling stations in Europe and a common data repository framework for static information, such as addresses, dispensing capabilities and means of payment.

The website was commissioned by the Clean Hydrogen Partnership as part of the new European Hydrogen Refuelling Station Availability System to help HRS Owners and Operators to connect to the system and share real-time availability of their stations with customers across Europe.

Eighth and Ninth Meeting of the Hydrogen Energy Network (13/12/2022 and 20/04/2023)

The Hydrogen Energy Network is an informal group of experts from Member States set up by DG ENER in 2019, composed by representatives from the ministries in charge of the energy policy. HyENet aims to support MS to develop on the opportunities offered by hydrogen as an energy carrier, acting as a platform of exchange of information, sharing of good practices, experiences and latest developments as well as joint work on specific issues.

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

The Clean Hydrogen Partnership has selected 15 regions to receive support in the framework of the latest Project Development Assistance (PDA) initiative. The regions are from a total of ten different countries (EU Cohesion Countries, European islands and Outermost Regions) and have been selected following a two-stage application and evaluation process.

The projects proposed by the regions cover a wide range of hydrogen applications, from hydrogen buses in the cities to ferries that connect island communities as well as industrial applications such as glass manufacturing.



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The selected regions will now receive targeted support from dedicated hydrogen consultants, beginning in early 2023. This will allow these regions to further develop their project plans, thus advancing the deployment of fuel cell and hydrogen technology in Europe, particularly in areas that have seen limited hydrogen deployments to-date.

The initiative will also deliver a wider impact in other regions beyond the 15 selected, through the planned "Observer Network" activities that will be run throughout 2023.

More information can be found at the initiative website: <https://www.h2regions.eu/>.

Innovation Fund

The results of the second call for small-scale projects of the **Innovation Fund** were published on 13 December 2022. Among the 17 projects selected for grant agreement (total budget EUR 100 million), four are directly addressing clean hydrogen production and use:

- The **HyPush** project, which will demonstrate a highly innovative hydrogen-powered pusher boat for bulk transports in the Paris metropolitan region in France. It will introduce hydrogen technology on inland waterways, namely a boat for pushing heavy barges in the Paris metropolitan area.
- The **VOZARTEK** project will help kick-start the green hydrogen market in the Moravian-Silesian Region (MSK) in Czechia by producing it locally. The hydrogen will be produced in electrolyzers powered by solar PV and biomass combined heat and power (CHP). The commercial operation is planned to start in 2026 with the output volume of 270 tonnes per year
- The **GreenH2CY** project which plans to produce green hydrogen and make it available in the Cypriot market for the first time. Hydrogen will be produced by electricity supplied from renewable energy sources. It will entail the installation and operation of a 2 MW Proton Exchange Membrane electrolyser. The hydrogen production plant is expected to produce approximately 150 tonnes of hydrogen fuel per year, equivalent to 627 tonnes of diesel fuel per year for transport use. The project will additionally include storage and a filling station for the fuel to be accessible to users.
- The **GreenH2** project which will install a 1 MW electrolyser with auxiliary installations, 1 MW photovoltaic plant, an energy management system and a waste heat recovery system in a refinery in Gdańsk, Poland. The project is expected to produce around 140 tonnes of hydrogen per year

The third call for large-scale projects was closed on 16 March 2023. For this call, the European Commission has received 239 applications from innovative clean tech projects. The project proposals applying to four different topics will now compete for a total call budget of €3 billion. The highest number of applications were submitted under the topic of general decarbonisation (98), followed by innovative electrification in industry and hydrogen (71), clean tech manufacturing (39), and mid-sized pilots (31). The Commission will inform the applicants and publish the results of the evaluation in the second half of July 2023.

The European Hydrogen Bank

The European Hydrogen Bank, announced by President von der Leyen in her State of the Union address, provides support to move the hydrogen economy from niche to scale and contribute to ambitions to produce 10 million tonnes (Mt) renewable hydrogen in the EU and import another 10 Mt to the EU by 2030.



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The main objective of the European Hydrogen Bank is to unlock private investments in hydrogen value chains, both domestically and in third countries, by connecting renewable energy supply to EU demand and addressing the initial investment challenges.

The objective of this facility is to cover the cost gap between renewable and fossil hydrogen in the absence of a sufficient green market premium, whilst leveraging a maximum amount of private financing into subsidized projects.

Alongside reducing the cost gap, the bank will contribute to early market formation by providing price/cost discovery through competitive auctions.

On the 16th of March, alongside the Net Zero Industry Act, a dedicated communication was published on the functioning of the Hydrogen Bank and its proposed activities

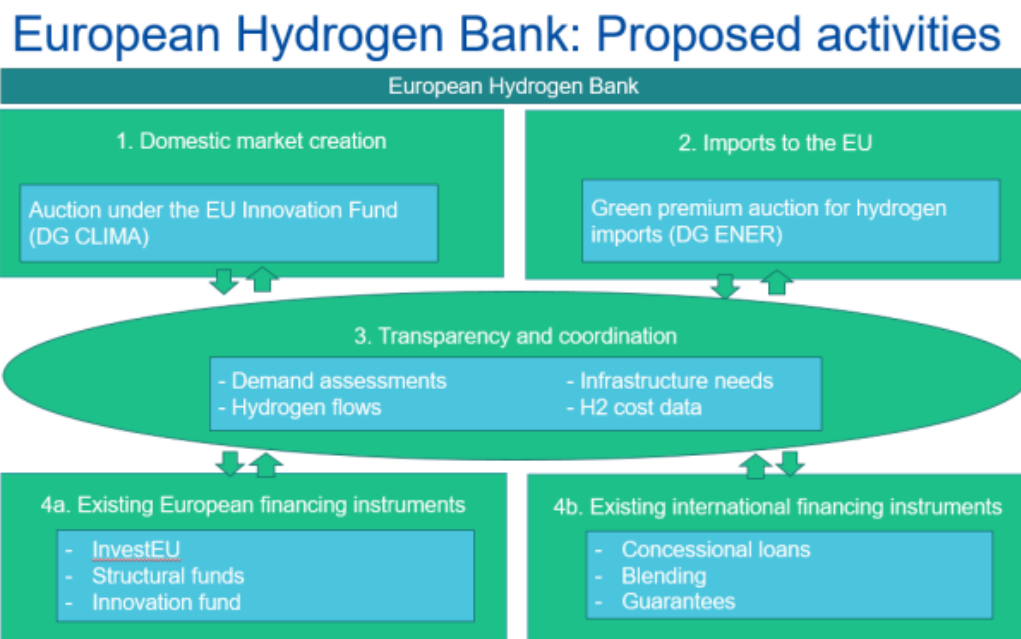


Figure 1. The four pillars of activities related to the European Hydrogen Bank

The four pillars of action of the European Hydrogen Bank are indicated in the Communication and are presented on Figure 1.

The Domestic side of the bank will be implemented through auctions under the Innovation Fund. The Commission will launch in autumn 2023 a first auction – or competitive bid – for supporting the production of renewable hydrogen. Winners of this auction will receive a fixed premium for each kg of renewable hydrogen produced over a period of 10 years. The Terms and Conditions (T&C) for the Auctions have been published on 31 March and a workshop will be organised on 16 May to gather the feedback of stakeholders on the T&C.

For the international leg, by end of 2023 options for a broader use of a Team Europe approach for the international leg of the Hydrogen Bank will be further explored. Including while not limited to pooling the efforts and resources and by facilitating synergies with existing financial mechanisms.

Important Projects of Common European Interest (IPCEI) on Hydrogen

The concept of important projects of common European interest (IPCEIs) is enshrined in Article 107(3)(b) of the Treaty on the Functioning of the European Union. It enables the Commission



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to approve State aid that Member States aim to grant for very large, risky and ambitious cross-border EU wide projects, notably on breakthrough innovations or for the construction of open infrastructures of great importance for the EU.

IPCEIs represent an important contribution to the achievement of strategic objectives of the Union, notably in view of their positive spill-over effects. They bring together Member States and stakeholders throughout the Union to undertake integrated and large-scale projects that provide significant benefits to the Union and its citizens, overcoming important market or systemic failures and societal challenges, which could not otherwise be addressed.

The Commission's approval of these IPCEIs is part of the wider Commission efforts to support the development of an innovative and sustainable European hydrogen industry.

The IPCEI Communication complements other State aid rules such as the Climate, Energy and Environment Aid Guidelines (CEEAG), the General Block Exemption Regulation (GBER) and the Research, Development and Innovation (R&D&I) Framework, which allow supporting innovative projects whilst ensuring that potential competition distortions are limited. The IPCEI Communication supports investments for R&D&I and first industrial deployment on condition that the projects receiving this funding are highly innovative and do not cover mass production or commercial activities. They also require extensive dissemination and spillover commitments of new knowledge throughout the EU, as well as a detailed competition assessment to minimise any undue distortions in the internal market.

The first General Assembly took place on 28 March 2023 in Berlin.

Additional IPCEIs in the pipeline

- **3rd Hydrogen IPCEI – Hy2Infra**
 - Focus: hydrogen production and infrastructure (pipelines, ports, storage facilities...)
 - State of play: under assessment
- **4th Hydrogen IPCEI – Hy2Move**
 - Focus: hydrogen use in the mobility and transport sectors
 - State of play: under assessment.

Other State Aid instruments – Projects under Climate, Environmental protection and Energy Aid Guidelines (CEEAG).

For stand-alone or dedicated infrastructure projects, environmental protection projects, there are other more suitable and streamlined State aid compatibility rules, such as the CEEAG.

7 projects are now supported under this scheme, in addition to the three already mentioned:

- 2 projects by Arcelor Mittal in Germany and Spain
- 1 project by Lotos, Poland
- 1 project by Fluxys, Belgium.

6. Regulations, Codes & Standards, and Safety Update

The [European Clean Hydrogen Alliance](#) (ECH2A) published on 2 March 2023 the [roadmap on hydrogen standardization](#). The roadmap provides a comprehensive overview of standardisation gaps, challenges and standardisation needs identified by the Alliance members, which still pose an important barrier to the roll out of hydrogen technologies and applications. The roadmap also includes a set of recommendations to streamline and accelerate the standardisation process in line with the Commission's Standardisation Strategy



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of 2 February 2022. It will inform the work of the Commission and the National and European standardisation bodies. In particular, it will allow the Commission to now prepare a standardisation request for identified hydrogen standards to the European Standardisation Organisations.

The [Clean Hydrogen JU](#) has set up a Regulations, Codes and Standards Strategy Coordination (RCS SC) Task Force, composed of the European Commission, Hydrogen Europe and Hydrogen Europe Research secretariats, and the JU Programme Office. The goals of the RCS SC Task Force are the definition, coordination and monitoring of the strategy related to RCS within the JU Programme with the ultimate goal of increasing the EU impact in RCS development in Europe and beyond, with the focus but not limited to Standards. Following a series of bilateral meetings among the organisations involved in the RCS SC Task Force, the Task Force kicked off its activities in November 2022, reviewing and scoping the tasks entrusted to the group. The operational activities of the RCS SC TF will contribute to steering and coordination of the RCS-related matters in the JU and maximising the impact of the JU Programme in this field.

On safety, the [European Hydrogen Safety Panel \(EHSP\)](#) has updated the guidance document for the [Safety Planning and Management in EU hydrogen and fuel cell projects](#) published in 2021, in view of keeping supporting EU projects to incorporate state-of-the-art hydrogen safety by integrating safety learnings, expertise, and planning. The updated document will be published in mid-2023 and includes, among others, additional information on the project safety documentation, additional safety principles/ strategies, additional sources of information on the Regulations Codes and Standards relevant to hydrogen, additional safety guidelines and recommendation, etc. Moreover, the EHSP activities have continued with the assessment of all JU projects from a safety-related perspective. Building on this assessment, several safety plans of JU-funded projects have been reviewed, providing recommendations for their improvement where necessary. Furthermore, in close collaboration with the Joint Research Centre (JRC) of the European Commission, the EHSP has continued to enlarge the HIAD 2.0 database (the total number of validated events is 741). In addition, the EHSP worked on a new document with the [Statistics, lessons learnt and recommendations from the analysis of the Hydrogen Incidents and Accidents Database \(HIAD 2.0\)](#), which is expected to be finalised in 2023, and has completed the collection of the phenomenological models, risk assessment approaches, and computational fluid dynamics (CFD) models developed from JU projects and elsewhere by the international hydrogen safety community. The comprehensive lists of phenomenological models, risk assessment approaches and CFD models for hydrogen safety engineering application have been compiled with links to relevant published documents in a report, 'EHSP Guidance on Hydrogen Safety Engineering' which will be published in mid-2023. Last, the EHSP has organised two webinars on '[Safety planning and management in EU hydrogen and fuel cell projects](#)' and a 'Webinar on CFD for hydrogen safety analysis' in December 2022, with 100+ attendees each.



Summary Country Update April 2023: European Commission⁴

The Clean Hydrogen Partnership is now developing the European Hydrogen Observatory. Updated data will only be available for the next IPHE Steering Committee.

Transportation	Target Number	Current Status ⁵	Partnerships, Strategic Approach	Policy Support
Fuel Cell light duty Vehicles ⁶	No target	To date, 1,791 FCEVs have been contracted through Clean Hydrogen JU, out of which 1,325 are currently deployed and 426 planned or in development phase, while 40 have been decommissioned.	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU
FC Bus	No target	- 283 buses deployed in Europe through Clean Hydrogen JU (of which 13 discontinued) - 71 more buses planned or developed through Clean Hydrogen JU	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU

⁴ Data reflecting state of play end of 2022, same as in the submitted November 2022 IPHE update. Next update will be in November 2023.

⁵ Data covering both FCH JU and FCH 2 JU projects (for simplicity referred to just as FCH JU), all inherited now by the Clean Hydrogen JU.

⁶ Includes Fuel Cell Electric Vehicles with Range Extenders



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Fuel Cell Trucks ⁷	No target	-14 garbage trucks contracted through Clean Hydrogen JU (REVIVE) -16 trucks contracted through Clean Hydrogen JU (H2Haul)	Addressed through Clean Hydrogen JU Demo projects. As of today marginal activity, however upcoming projects will demonstrate a fleet within the next years (minimum 150 trucks).	Grant with maximum contribution from Clean Hydrogen JU
Forklifts	No target	- 335 deployed in Europe (of which 273 via Clean Hydrogen JU)	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU
Aviation & Maritime	No target	- 4 fuel cell vessels planned - 1 pilot aircraft planned	Addressed through Clean Hydrogen JU Demo projects. As of today marginal activity.	Grant with maximum contribution from Clean Hydrogen JU
H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
70 MPa On-Site Production	No target	-193 HRSs deployed for road transport (buses, cars, trucks MHVs) and around 82 planned or under construction.	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU
70 MPa Delivered	No target	From the above, 85 HRS have been deployed via Clean Hydrogen JU out of which: <ul style="list-style-type: none"> • 12 x 350 delivered H2 	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU

⁷ As above



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35 MPa On-Site Production	No target	<ul style="list-style-type: none"> • 7 x 350 onsite production • 7 x 350 unspecified • 4 x 700 delivered H2 • 2 x 700 onsite production • 31 x 350/700 delivered H2 • 14 x 350/700 onsite prod. • 3 (others) trucked-in • 2 (others) onsite production • 4 have been decommissioned 	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU
35 MPa Delivered	No target	<ul style="list-style-type: none"> • 27 additional HRSs contracted via Clean Hydrogen JU 	Addressed through Clean Hydrogen JU Demo projects	Grant with maximum contribution from Clean Hydrogen JU
Stationary	Target Number ⁸	Current Status	Partnerships, Strategic Approach	Policy Support
Small ⁹	No target	4,161 contracted via Clean Hydrogen JU of which 2,978 deployed	Medium-scale deployment through Clean Hydrogen JU demo project	Grant with maximum contribution from Clean Hydrogen JU
Medium ¹⁰	No target	74 contracted of which 36 deployed	Small-scale demo projects via Clean Hydrogen JU	Grant with maximum contribution from Clean Hydrogen JU

⁸ Targets can be units installed and/or total installed capacity in the size range indicated

⁹ <5 kW (e.g., Residential Use), excl. telecom backup

¹⁰ 5kW – 400 kW (e.g., Distributed Residential Use), excl. telecom backup



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Large ¹¹	No target	2 deployed of which one deployed (in China) and 1 planned	Small-scale demo projects via Clean Hydrogen JU	Grant with maximum contribution from Clean Hydrogen JU
District Grid ¹²	No target			
Regional Grid ¹³	No target			
Telecom backup	No target	10 deployed via Clean Hydrogen JU, of which 9 medium and 1 small	Small-scale demo projects via Clean Hydrogen JU	Grant with maximum contribution from Clean Hydrogen JU
H₂ Production	Target¹⁴	Current Status	Partnerships, Strategic Approach	Policy Support
Fossil Fuels ¹⁵	No target	Out of scope of the Clean Hydrogen 2 JU		
Water Electrolysis ¹⁶ (PEM, Alkaline, SOEC)	Renewable hydrogen: 6 GW by 2024, 40 GW by 2030	37.6 MW of electrolyzers deployed in Europe through Clean Hydrogen JU and another 34.9 MW planned.	Projects via Clean Hydrogen JU	Grant with maximum contribution from Clean Hydrogen JU

¹¹ 0.3MW – 10 MW (e.g., Industrial Use)

¹² 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

¹³ 30MW plus (e.g., Grid Storage and Systems Management)

¹⁴ Target can be by quantity (Nm³, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

¹⁵ Hydrogen produced by reforming processes

¹⁶ Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)



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	(EU Hydrogen Strategy ¹⁷)	The total water electrolysis capacity ¹⁸ in EU27 is estimated around 120 MW.		
By-product H ₂	No target			
Energy Storage from Renewables	Target¹⁹	Current Status	Partnership, Strategic Approach	Policy Support
Power to Power ²⁰ Capacity	No target			
Power to Gas ²¹ Capacity	No target	40 Clean Hydrogen JU (Research & Demonstration) projects contribute directly or indirectly in the PtG concept with 140.5m€ funding.	Projects via Clean Hydrogen JU	Grant with maximum contribution from Clean Hydrogen JU

¹⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN>

¹⁸ Combining information from Hydrogen's Europe [Clean Hydrogen Monitor 2022](#) (reporting for EU+EFTA+UK) and FCHO [Technology and Market Report](#), March 2022

¹⁹ Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

²⁰ Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

²¹ Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)