



REPLIES OF THE EUROPEAN COMMISSION TO THE EUROPEAN COURT OF AUDITORS' SPECIAL REPORT

The EU's industrial policy on renewable hydrogen

Legal framework has been mostly adopted – time for a reality check

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This document presents the replies of the European Commission to observations of a Special Report of the European Court of Auditors, in line with Article 259 of the [Financial Regulation](#) and to be published together with the Special Report.

I. THE COMMISSION REPLIES IN BRIEF

The European Commission published its hydrogen strategy in July 2020. The strategy was part of a broader strategy to transform Europe's energy system to enable an effective, affordable and deep decarbonisation of the European economy¹.

The hydrogen strategy also followed on the back of EU's recovery plan to address the negative impacts of COVID-19 on the EU economy², where clean hydrogen was highlighted as one of the key clean technologies and value chains to unlock investments.

On the basis of this strategy, the European Commission put forward a set of regulatory measures to support the development of a completely new industrial ecosystem for hydrogen. These regulatory proposals for hydrogen were integrated in a broad set of energy and climate policy proposals, such as the revised renewable energy directive, the guidelines on trans-European energy infrastructure, the hydrogen and decarbonised gas market package, the FuelEU Maritime and the REFuelEU Aviation regulation, the Net-Zero Industry Act, and the EU Emissions Trading Scheme to allow for free allowances for electrolyzers and the EU ETS price signals to name a few.

The ECA special report on the EU's industrial policy on renewable hydrogen comes into play when most of the legal framework has just been adopted. The Commission notes that the report observes that the legal framework is mostly complete and that the report does not recommend changes to the legislative framework. Each of the regulatory measures has had an impact on the development of a European industrial ecosystem for hydrogen and is already helping to narrow down the cost competitiveness between renewable and low-carbon hydrogen and their fossil-fuel based counterparts. At the same time, the industrial policy impacts of these measures should also be seen with regard to their broader impacts on energy system integration, energy security, industrial competitiveness of both energy producers and energy consumers, and the decarbonisation of the European industry. This is why the Commission in its assessments of hydrogen-related policies considers not only the impact on competitiveness of hydrogen production, but also the impacts on electricity and gas prices, greenhouse gas emissions, fossil fuel imports as well as social and environmental impacts.

Furthermore, it is important to recognise that a European hydrogen ecosystem is still in a very early stage, and that the regulatory framework has not even been transposed into national legislation in some cases. Besides the necessary regulation, there are many different segments of the industrial value chain for hydrogen that need to be initiated simultaneously, including the development of additional renewable resources to produce renewable hydrogen, the upscaling of electrolyser technologies and associated manufacturing capacity to convert renewable electricity into hydrogen, the development of new pipelines, compressors, storage and hydrogen refuelling stations to bring hydrogen to the end-use sectors, as well as new industrial production processes, fuel cells, turbines and motors to replace the use of fossil fuels with hydrogen in end-use applications.

The development of a European hydrogen ecosystem will also be inherently local before it can become European. The consumption of renewable hydrogen will start where there is already consumption of fossil-based hydrogen today. Trade of hydrogen at industrial scale is not possible without a hydrogen infrastructure network where multiple producers and consumers can inject or withdraw hydrogen. Already in 2020, the European hydrogen strategy recognised that "*the hydrogen*

¹ Powering a climate-neutral economy: An EU Strategy for Energy System Integration, COM/2020/299 final

² 'Europe's moment: Repair and Prepare for the Next Generation', COM(2020) 456 final

ecosystem in Europe is likely to develop through a gradual trajectory, at different speeds across sectors and possibly across regions and requiring different policy solutions”.

The nascent and consequently dynamic nature of developing a new industrial ecosystem for hydrogen is still evident today. Electrolyser manufacturing capacity in the EU has shifted from being a bottleneck for project development to a status of oversupply within a couple of years³, but is still too limited to meet the European market needs in the medium-term as proposed in the Net-Zero Industry Act⁴. Some Member States already have increased their initial objectives for electrolyser deployment due to the potential project pipeline, whilst other Member States are still waiting for their first projects to be developed. Hydrogen cost projections also still fluctuate due to renewable electricity prices have both been at records high and records low within the last couple of years.

The Commission welcomes the ECA’s audit on the current stage of the development of a European hydrogen ecosystem. However, the development of a European hydrogen ecosystem is still in its initial stage and still very dynamic, with single investment decisions impacting whether there might be scarcity or surplus in parts of the hydrogen value chain. The Commission therefore believes that it is too early to assess whether the necessary conditions created to support an emerging hydrogen market can be considered a success or not. Moreover, several of the objectives to develop a hydrogen ecosystem are set after 2024, and it is therefore too early to evaluate whether these objectives have been achieved or not. The Commission remains of the opinion – as highlighted in its hydrogen strategy – that only “By 2030 the EU will aim at completing an open and competitive EU hydrogen market, with unhindered cross-border trade and efficient allocation of hydrogen supply among sectors”.

Against this backdrop, the Commission considers that a comprehensive assessment of whether the objective to build a European hydrogen ecosystem has been successfully achieved can be carried out only at a later stage. Nevertheless, the Commission regards the results of this audit as useful to support the implementation of the legal framework that has been created for hydrogen in recent years, to assess any remaining challenges in the development of the different segments of a hydrogen ecosystem, and to reflect upon the actions that could be considered for developing further the hydrogen ecosystem.

II. COMMISSION REPLIES TO MAIN OBSERVATIONS OF THE ECA

1. EU Production and Import targets

The Commission notes the ECA’s critical assessment of the aspirational targets set by European Commission on the development of renewable and low-carbon hydrogen in the European hydrogen strategy and the REPowerEU communication. The ECA report observes that these renewable hydrogen targets were not clearly defined and driven by political will rather than robust analyses (par. 122).

In 2020, the European hydrogen strategy defined a strategic objective of 10 million tonnes of renewable hydrogen production within the EU in 2030, and at least 40 GW of installed capacity of renewable hydrogen electrolyzers as highlighted in Figure 6 of the ECA report. These strategic

³ BNEF (2024) Electrolyser Manufacturing 2024: Too Many Fish in a Tiny Pond. For example, European electrolyser manufacturing capacity has grown from 3 GW/yr in 2021 to 4.2 GW/yr in 2022 and 6.8 GW/yr in 2023. The expectations for total installed electrolyser stack assembly capacity for 2024 are 12.4 GW/yr.

⁴ SWD(2023) 219 final

objectives were based on the decarbonisation potential to replace fossil-based hydrogen consumption, and the industry's readiness to develop an industrial supply chain to deploy electrolyzers. The hydrogen strategy references a study, commissioned by the Commission that provides the relevant data used to estimate the costs and investments needs, and which clarified the units used within the calculations⁵.

In 2021, the regulatory proposals on the basis of the EU hydrogen strategy set **actual binding targets** for the demand of Renewable Fuels of Non-Biological Origin (RFNBOs) in industry and the transport sector. These **binding targets** were based on the availability of 40 GW output of electrolyzers in 2030, corresponding to demand obligations of 5.6 million tonnes of renewable hydrogen, or the equivalent of 6.6 million tonnes if hydrogen demand for e-fuels were included as well, as highlighted in Table 2 of the ECA report. These obligations for renewable hydrogen consumption in industry and transport apply to all Member States.

The REPowerEU plan subsequently proposed to maintain the European production of renewable hydrogen to 10 million tonnes (as originally in the EU hydrogen strategy) and to add an aspirational import target of 10 million tonnes of renewable hydrogen with the main purpose of reducing the imports of fossil fuels from Russia (see Figure 6 of the ECA report).

It is important to note that the REPowerEU plan came with a call to the co-legislators to increase the binding targets in the Renewable Energy Directive. The communication suggested to increase the binding target for industrial demand of renewable hydrogen from 50% to 75% of hydrogen consumption, and to increase the binding target of RFNBOs in fuel supplies to the transport sector from 2.5% to 5%.

However, the co-legislators decided in the course of 2023 to **reduce both binding targets** to 42% of hydrogen consumption in industry, and 1% of fuels supplied to the transport sector. Therefore, the binding targets will result in lower volumes of both domestic hydrogen production and imports than the aspirational targets envisioned under REPowerEU.

Furthermore, the REPowerEU plan proposed the development of three major hydrogen import corridors via the Mediterranean, the North Sea area and, as soon as conditions allow, with Ukraine to support the aspirational import target. The first steps for the development of these hydrogen corridors, including terminals to facilitate imports by ships, have been taken with the inclusion of the relevant hydrogen projects in the sixth list of projects of common interest and projects of mutual interest. The finalisation of these hydrogen corridors by 2030 will determine the extent of hydrogen import possible by pipelines vis-a-vis hydrogen imports by ships⁶.

The lower consumption binding targets for RFNBO in industry and transport agreed in co-legislation and the availability of hydrogen infrastructure are likely to impact the hydrogen production and demand within the EU. The change in these binding targets has not helped in ensuring legal certainty and creating confidence among hydrogen investors. This may have also postponed or discontinued certain hydrogen investments. The Commission acknowledges the challenges in developing the different industrial value chains both within and outside of the EU to meet aspirational targets of 10 million tonnes of European hydrogen production and 10 million tonnes of hydrogen imports by 2030, as indicated in the ECA report on page 19. However, both Commission scenarios as well as scenarios from many different stakeholders indicate that demand for renewable hydrogen will continue to

⁵ Hydrogen generation in Europe. Overview of costs and key benefits.

⁶ European Commission, Directorate-General for Energy, Assessing hydrogen infrastructure needs in a scenario with hydrogen imports and EU production – METIS 3 – Study S8, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2833/64684>

grow, especially in the period between 2030 and 2050⁷. For example, the assessment supporting the Commission's climate target plan foresees between 27 and 35 million tonnes of renewable hydrogen consumption in 2040, increasing to 66 million tonnes in 2050⁸ to meet EU's decarbonisation objectives in the most cost-effective way.

Similarly, recent studies by both intergovernmental organisations as well as industry associations foresee the EU as an important interlocutor for developing a global hydrogen market, both as a buyer and seller of hydrogen within Europe as well as with other world regions⁹.

It is important to note that the aspirational targets set for 2030 are only one part of the broad vision set out in the Hydrogen Strategy and the REPowerEU communication. Other elements include the development of an investment agenda, the development of a hydrogen infrastructure, research and innovation, international cooperation, and to reduce the dependence on imports of Russian fossil fuels. Furthermore, the broader objectives of these communications are ultimately the decarbonisation of the European economy through energy system integration, whilst ensuring energy security, competitiveness and the development of a European hydrogen ecosystem. Therefore, the Commission believes that the broad direction of these strategies can be maintained to send a strong signal that rapid progress will be needed to meet the needs in the period between 2030 and 2040 and to avoid increasing uncertainty for investors.

2. Ramp-up of the Renewable Hydrogen Value Chain

The development of an industrial ecosystem for renewable hydrogen is in an early stage and a market where renewable and low-carbon hydrogen is traded does not exist. The Commission has been tracking progress on costs and competitiveness through its annual Clean Energy Technology Observatory report¹⁰ and its Clean Energy Competitiveness reports¹¹, and has been actively involved in bringing together producers, suppliers, and the infrastructure developers needed as a prerequisite for a future hydrogen market.

Furthermore, European hydrogen strategy proposed a phased approach towards the development of an industrial ecosystem for hydrogen. The vision included a first development phase up to 2024, and with the development of a market for renewable hydrogen envisioned to emerge by 2030. Reaching maturity in 2030, large scale deployment to reach all hard-to-decarbonise sectors was expected only after 2030. This vision is also reflected in the legal framework for hydrogen, where hydrogen demand binding targets do not apply before 2030 and where Member States can apply certain derogations for hydrogen infrastructure up to 2030.

Therefore, the audit's results do provide an important reflection point to assess the first development phase up to 2024.

The current developments reflect to a significant extent the vision set out in the hydrogen strategy, which called for a scale-up of electrolyzers and deployment alongside existing demand centres. The first 100MW and 200MW electrolyzers are under construction but are not operational yet. The current

⁷ The Commission's JRC technical report "The role of hydrogen in energy decarbonisation scenarios" (2022) shows a consistent trend across many scenarios.

⁸ Impact assessment, 2040 Climate Target Plan, https://climate.ec.europa.eu/document/download/768bc81f-5f48-48e3-b4d4-e02ba09faca1_en

⁹ IRENA & WTO (2023) International trade in green hydrogen; Hydrogen Council (2023) Hydrogen Insights

¹⁰ CETO 2023 Status Report on water electrolysis and hydrogen in the European Union & CETO 2023 Status Report on renewable fuels of non-biological origin in the European Union.

¹¹ COM/2023/652 final

electrolysers under operation or under construction are mostly located close to existing hydrogen consumers, and the first investment decisions for the use of hydrogen in the steel sector have been taken. The Commission's annual report on progress on competitiveness of clean energy technologies tracks the progress on water electrolysis and recognized that deployment projects are experiencing delays due to the nascent nature of the market, economic and technical complexity, and delays in off-taker investments due to the economic situation¹². At the same time, the more recent results of the first auction (for a limited amount of 800 million euro) under the European Hydrogen Bank are promising and show that producers and off-takers are finding each other, and that more than half of the proposed projects plan to be operational in less than three years¹³. However, we acknowledge that hydrogen production potential across the EU should be harnessed.

The ECA report rightly points out that many of the projects under construction and/or at an advanced stage are in a limited number of Member States (see paragraph 133 of the ECA report). However, this is in line with the Hydrogen Strategy and EU hydrogen policy framework where the first hydrogen production is expected to take place on-site at existing hydrogen consumers. Current hydrogen demand is concentrated in a small number of Member States¹⁴ (nine Member States account for more than 80% of existing hydrogen demand). At the same time, the European Hydrogen Bank results show that there is the potential to produce lower cost hydrogen in Member States with renewable resources, which enforces the EU's efforts to support cross-border hydrogen infrastructure.

It is also important to note that the binding targets for renewable hydrogen demand do not apply before 2030 to allow Member States to develop tailor-made solutions to their specific situation and needs, whilst ensuring a level-playing field for future producers and consumers of hydrogen, as well as hydrogen transport and storage operators. The ECA report correctly points out that it is too early to assess the impacts of the legal framework on cost competitiveness (see paragraph 62-63 tbc), but the Commission is already working with Member States on the implementation of the legal framework and will issue a guidance on the implementation of the obligation for RFNBO consumption in industry in 2024.

At the same time, the Commission agrees with the ECA that it is very important to continue to monitor the development of the different segments of the industrial value chain for hydrogen, to support the rapid implementation of the legal framework within the Member States, and to help coordinate the matching of consumers, suppliers and the availability of infrastructure (see paragraph 78). To this end, the European Commission has asked the members of the European Clean Hydrogen Alliance to update the project pipeline published in 2021. Furthermore, the European Commission will establish a pilot voluntary mechanism for support to market development for hydrogen by 2025. The objective of such mechanism will be market development visibility as well as demand and supply assessment for hydrogen to be implemented under the activities of the European Hydrogen Bank. This mechanism will collect and assess information from offtakers and suppliers about demand and supply of hydrogen and will provide access to this information to participants.

¹² COM(2023) 652 final

¹³ Competitive bidding - European Commission (europa.eu)

¹⁴ Clean Hydrogen Observatory, based on the latest demand data. Hydrogen Demand, European Hydrogen Observatory (europa.eu)

3. EU funding for hydrogen projects

The Commission agrees with the ECA that financing is an important element to support the development of a European hydrogen ecosystem (see paragraph 83) and welcomes the detailed assessment of funding for renewable and low-carbon hydrogen projects.

It is important to recognise that the European hydrogen strategy was published less than two months after the publication of EU's Recovery Plan and included a dedicated chapter on the development of an investment agenda for hydrogen. In 2021, to support Member States' use of the Recovery and Resilience Facility, the European Commission developed a dedicated European Flagship PowerUp to support the building and sector integration of 6 GW of electrolyser capacity and production and transportation of 1 million tonnes of renewable hydrogen across the EU by 2025. The Important Projects of Common European Interest (IPCEI) for hydrogen were also initiated in that period and have been another funding source that has helped to coordinate the development of innovative hydrogen projects across Member States. Additionally, the Commission is supporting hydrogen projects through the EU Innovation Fund and its newly established EU-wide renewable hydrogen auction. The proposal to introduce 'carbon contracts for difference' for hydrogen under the EU ETS Innovation Fund have been postponed in favour of the introduction of the aforementioned 'green premium' renewable hydrogen auctions based on stakeholder feedback¹⁵ and budget considerations.

In particular, the Commission underlines the importance of the RRF to promote the hydrogen sector in the EU (see paragraph 94 of the ECA report.). The Commission recalls that milestones and targets to be achieved by Member States to unlock payments are set by the Council and are specific to each Member State and to each set of national reform and investment. They are therefore not directly comparable. The verification mechanisms referenced by the ECA represent a purely technical agreement between the Commission and the Member States concerning the evidence they intend to submit for the fulfilment of the milestones or targets. Therefore, as already clarified in the Commission's reply to SR 26/2023, verification mechanisms are not binding on either party and do not overrule the requirements set by the Council. Therefore, the Commission does not consider that more precise verification mechanisms represent 'an increased risk' for Member States not to reach milestones and targets.

The Commission agrees that more exhaustive information about both public and private sector financing is needed (par. 80), and that it is therefore important to assess the total investments plans to meet the binding targets under the Renewable Energy Directive or the different strategic objectives set within national hydrogen strategies. At the same time, the Commission wants to raise the importance of assessing and evaluating any investment needs for hydrogen in the broader context of the investment needs for the energy transition agenda. The Commission agrees that monitoring the costs and investment needs will continue to be important, especially because the industrial value chain is in a nascent stage and costs and prices vary strongly between member states and fluctuate over time.

The Commission agrees that efforts made to pool member states' resources and increase efforts at EU level through the Strategic Technologies for Europe Platform (STEP) did not lead to additional budget allocation specifically for renewable hydrogen (see paragraph 105). STEP is not a new programme with own resources but is supporting reprogramming from existing funds. The Commission points out nevertheless that additional funding was requested in its initial proposal but

¹⁵ Designing a competitive bidding tool to fund hydrogen innovation: stakeholder consultation - European Commission (europa.eu)

rejected by the Member States¹⁶. In this context, hydrogen projects receiving a STEP Seal in the European Hydrogen Bank pilot auction might benefit from such reprogramming and receive funding.

Finally, the Commission would like to point out that the large majority of investments needed to develop a European hydrogen ecosystem is associated with the development of new renewable power generation capacity. It is therefore equally important to track the investments in renewables, including through renewable power purchase agreements. The newly agreed Electricity Market Design already includes new measures to streamline support and accelerate investments in renewable power generation, and the National Energy and Climate Plans already included a number of requirements to report on the available support schemes and the expectations for the market of renewable power purchase agreements in Member States. The Commission has also published new guidelines for Member States to accelerate the implementation of the new regulation¹⁷.

4. Coordination between Commission, Member States and Industry

The Commission coordinates the development of an industrial ecosystem for hydrogen through a number of instruments. The most important mechanism is through the National Energy and Climate Plans (NECPs), due before July 2024, where Member States report on how they meet different energy and policy obligations, including with regards to the binding targets for hydrogen. The Commission intends to use its feedback on these draft NECPs to ensure that they contain clear roadmaps of how Member States are achieving their binding targets.

The Commission believes that any coordination of hydrogen activities should remain part of broader coordination efforts on EU's energy and climate objectives, and that the Commission should not develop alternative roadmaps at EU level. Additionally, an additional EU roadmap would duplicate what is already in the NECPs.

Since the regulatory framework for hydrogen is implemented as an integral part of different legislations, the regular channels for these legislations are used to coordinate and discuss with Member States and stakeholders. For example, the Council working parties on Energy, Shipping, Aviation and Environment are all used to coordinate the implementation of different hydrogen-related provisions with Member States. Furthermore, the Commission supports dedicated platforms to support coordination. For example, the CA-RES¹⁸ platform is used to exchange experiences and best practices with Member States on the renewable energy directive, including its RFNBO binding targets in industry and transport.

Additionally, the Commission has established the Hydrogen Energy Network (HyNEt) as an overarching coordination mechanism to allow Member States to update each other about hydrogen-specific activities. The HyNET meetings take place a number of times per year and provide Member States with an opportunity to share the content of their strategies and related activities.

New legislation agreed within the Trans-European Network for Energy and the Hydrogen and Gas Decarbonisation Package will also support the coordination between Commission, Member States and industry when it comes to development of a future hydrogen infrastructure. The Commission is already supporting the development of a European Network of Network Operators of Hydrogen

¹⁶ The Commission nevertheless recalls that the EDF was reinforced in the amount of EUR 1.5 billion under the STEP regulation.

¹⁷ [Recommendation and guidance on speeding up permit-granting for renewable energy and related infrastructure projects – European Commission \(europa.eu\)](#)

¹⁸ Concerted Action Renewable Energy Sources Directive, www.ca-res.eu

(ENNOH) to ensure a more integrated network planning between electricity, gas and hydrogen networks. The provisions also ensure that all Member States in the process of developing hydrogen transmission networks are represented in ENNOH.

The IPCEI process also support a mechanism to coordinate investments needs across multiple Member States. Several projects that were put forward by Member States under the IPCEI process were enabled through the Climate, Energy and Environmental Aid Guidelines (CEEAG), because they did not fit under the IPCEI rules. Furthermore, it is important to stress that the overall IPCEI process encompasses the national process in the Member States before an IPCEI starts plus the State aid assessment process of the Commission plus the national process in the Member State after the adoption of a Commission decision. For the latter, approval of State aid does not mean that projects immediately receive grants from their Member States. Indeed, as the ECA itself observes for the IPCEIs Hy2Tech and Hy2Use after the approval of the State aid by the Commission, several Member States have not launched the national process to make funding available to projects (see paragraph 76 of the ECA report). This being said, the Commission has no power or competence to oblige Member States to make the authorized financing effectively available.

The Commission also established the European Clean Hydrogen Alliance to enable the coordination amongst industry players, academia and non-governmental organisations across the full value chain (see paragraph 115 to 119 of the ECA report). The organisation of a number of roundtables reflecting different segments of the industrial value chain allowed the large number of stakeholders to coordinate their activities accordingly. In establishing the European Clean Hydrogen Alliance, the Commission was able to identify clean Hydrogen projects (the planned project pipeline was used by Member States to prepare the four IPCEI hydrogen waves¹⁹ that have been approved by the Commission).

For reasons of commercial sensitivity, the European Clean Hydrogen Alliance project owners are asked to provide the Commission with details of their projects that can be made publicly available. The Commission is currently updating the project pipeline in particular to determine how many projects are reaching FID (final investment decision) and to identify the barriers (including funding gaps) preventing them from doing so. It is using the same project milestone questions that it has agreed with the Member States to apply in their annual evaluation of hydrogen-related IPCEI projects.

The Commission sets up industrial alliances to facilitate matchmaking, enhance information exchange and consultation as well as to identify barriers that hinder the roll out of projects and the hydrogen ecosystem across the internal market. The Alliance has played an important role in bringing together a large set of stakeholders, and the different roundtables and reports have provided valuable input for the development of the legislative framework and its implementation. For example, Alliance's Standardisation Roadmap has been transmitted to CEN /CENELEC and is being used to prioritize and accelerate the development of needed standards in this field. The Alliance has also resulted in commitments to increase manufacturing capacity by EU based electrolyser producers (through the European Electrolyser partnership.)

The Commission points out that the Alliance's membership continues to grow and currently has surpassed 1750 members. Nevertheless, it accepts that the Alliance's work needs to be more focused and evolve in line with the development of the EU's hydrogen ecosystem. In particular, it now needs to change its focus to facilitating the diffusion of hydrogen production and application processes across the EU and ensuring that planned projects are actually realised by identifying cross-border barriers. Therefore, within its steering committee, the Commission's services are seeking to refocus

¹⁹ Hy2Tech, Hy2Use, Hy2Infra & Hy2Move

the activities of the Roundtables to project implementation and the national effective implementation of the newly adopted EU measures.

Finally, the Commission is part of a number of international activities to coordinate engagement with third countries, including through the Clean Energy Ministerial, Mission Innovation, the International partnership for Hydrogen and Fuel Cells in the Economy (IPHE), the International Renewable Energy Agency and the International Energy Agency. For example, the European Commission co-chaired IRENA's Collaborative Framework on Green Hydrogen in its first two years and is a co-chair of the Clean Hydrogen Mission under Mission Innovation.

Together, these different coordination mechanisms provide a broad spectrum of avenues to bring together the Commission, Member States, industry and civil society.

III. COMMISSION REPLIES TO THE RECOMMENDATIONS OF THE ECA

Recommendation 1 - Following a reality check, make strategic choices on the way ahead without creating new strategic dependencies

In close collaboration with the Member States, the Commission should decide on the strategic way forward towards decarbonisation without altering the competitive situation of key EU industries, possibly resulting in further deindustrialisation. In particular, the Commission should:

- (a) update its hydrogen strategy based on a careful assessment of the following aspects:**
 - (i) how to calibrate market incentives for renewable and low-carbon hydrogen production and use, taking recent legislative changes into account**
 - (ii) how to prioritise scarce EU funding (e.g. focusing on which parts of the value chain),**
 - (iii) the geopolitical implications of EU production compared to imports from non EU countries, i.e. which industries does the EU want to keep and at what price.**

(Target implementation date: end 2025)

The Commission **accepts** the recommendation.

The Commission developed a hydrogen strategy in 2020 and has consistently implemented this strategy through the development of a regulatory framework that takes into account the role that hydrogen plays from an energy system integration perspective in the decarbonisation of the EU economy. The associated regulation has only recently been agreed.

The Commission agrees that following the submission of the National Energy and Climate Plans, in which Member States shall report the amount of renewable fuels of non-biological origin to be consumed in the different end-use sector, and the amount that they expect to import and export, the EU hydrogen strategy can be updated to take into account the Member State plans. This information

can also be used to assess the need for any additional market incentives, including the allocation of scarce EU funding. However, any prioritisation of scarce EU funding should also consider the investment needs for energy efficiency, electrification and infrastructure needs for other energy carriers needed to ensure the decarbonisation of the EU economy.

An updated hydrogen strategy can also consider the geopolitical implications as recommended by ECA. As a basis, the Commission suggests to use the expected production and consumption of renewable hydrogen that the member states will report as part of its assessment of the final national energy and climate plan. Furthermore, the Commission considers that it is important to take into account the EU external energy engagement strategy published alongside the REPowerEU plan in 2022²⁰.

(b) update the renewable hydrogen production and import targets set by the REPowerEU plan so that they are ambitious but realistic. In doing so, it should consider regional and industrial sector specificities and the role of low-carbon hydrogen.

(Target implementation date: end 2025)

The Commission **does not accept** the recommendation.

The aspirational renewable hydrogen production and imports targets proposed in the REPowerEU plan were set with the objective to end the EU's dependence on Russian fossil fuels as soon as possible and tackle the climate crisis. The aspirational targets in REPowerEU plan were backed with a request to increase demand obligations for renewable hydrogen in the industry and transport sector. With the legislation and associated demand obligations for 2030 in place, the Commission accepts to assess whether the aspirational targets can be reached, but cannot commit to any update at this stage.

The Commission also believes that the objectives that underpin the ambitions to produce 10 million tonnes of renewable hydrogen within the EU and 10 million tonnes of renewable hydrogen imports are still valid, but recognises that the challenges in scaling up the hydrogen value chain and that the current project pipeline both within the EU as well as internationally is insufficiently advanced. Furthermore, there is still uncertainty regarding the year within which infrastructure will be available to connect producers and consumers, including for imports from third countries. A downward review of the targets would have further implications for the investors' certainty climate.

Finally, regional or industrial sector specificities are likely to be developed by member states, as is the case within their NECPs today.

Recommendation 2 – Set out an EU roadmap and monitor progress.

In close collaboration with the Member States, the Commission should:

²⁰ JOIN/2022/23 final

- (a) set out and publish an EU roadmap for the development of a hydrogen value chain towards 2030 and beyond, based on its assessment of the national energy and climate plans and its updated hydrogen strategy;**

(Target implementation date: mid 2026)

The Commission **does not accept** the recommendation. The Commission accepts to update the EU hydrogen strategy under recommendation 1a. This updated strategy will include the hydrogen-related activities in the NECPs. This will add additional value in supporting the development of a European hydrogen ecosystem. The Commission does not believe that an EU roadmap on top of an updated hydrogen strategy will add value.

To a large extent, the activities associated with the implementation of any EU strategy lie with the member states, and their actions cannot be detailed in a EU roadmap developed by the European Commission, which would also contribute to additional bureaucracy. The Commission also disagrees with the idea that such EU roadmap would include separate hydrogen roadmaps per Member State.

As intended, the Commission will use the Governance Regulation and its associated National Energy and Climate Plans and progress reports to track and assess the Member States' progression towards the 2030, 2040 and 2050 energy and decarbonisation targets set for the EU.

- (b) monitor the EU's and Member States' progress in achieving binding and non-binding targets by means of a scoreboard.**

(Target implementation date: mid 2026)

The Commission **accepts** the recommendation. The Commission supports the recommendation to track progress. Already, the Commission has supported the establishment of the Clean Hydrogen Observatory, as an initiative by the Clean Hydrogen Joint Undertaking, to track production, trade, costs, end-uses, infrastructure development, innovation activities as well as policies, standards and financial tools in each of the Member States. Furthermore, the Observatory brings together leading scenarios for future hydrogen demand in Europe in 20230, 2040 and 2050.

Additionally, the annual progress report on the competitiveness of clean energy technologies and the Clean Energy Technology Observatory reports can be used to monitor progress on the different parts of the value chain.

Based on these monitoring processes, a scoreboard can also be developed although several parameters, such as technology costs, will be EU-wide rather than national. However, the Commission does believe that it would remain difficult to monitor Member States progress towards any non-binding targets.

Recommendation 3 - Obtain reliable national funding data and assess the appropriateness of EU funding arrangements accordingly

The Commission should do the following:

- (a) work in close cooperation with member states, and if necessary, propose reporting obligations, to obtain information on investment plans and on planned and actual national public funding for the ramp up – at least for the industries to be identified under Recommendation 1. It should report on this overview, for example in the**

reports on the state of the Energy Union. The overview should cover all parts of the hydrogen value chain.

(Target implementation date: end 2025)

The Commission **partially accepts** the recommendation. The Commission already has a process in place under the Governance Regulation to track policies, including public financing, in Member States towards the EU energy and climate objectives of 2030 and beyond.

The Commission will use this process, which is based on close cooperation and coordination with Member States, to monitor information on public funding, especially for meeting the specific obligations for renewable hydrogen. Please note that an update the European hydrogen strategy will not include detailed information per industry sector and per member states, as this is the prerogative of the member states.

Furthermore, the Commission considers that any reporting on the broader tracking of investments needs for the ramp up of a renewable and low-carbon hydrogen ecosystem should be part of an overall assessment of the investment needs to support energy system integration, including energy efficiency, electrification, all renewable and low-carbon fuels as well as the infrastructure needs in terms of the relevant manufacturing chains (e.g. electrolyzers) for the different energy carriers needed to ensure the decarbonisation of the EU economy.

The first assessment of the final national energy and climate plan is expected to be done in the first quarter of 2025.

(b) assess whether the current EU funding arrangements are appropriate for the future development of the hydrogen value chain across the EU.

(Target implementation date: end 2025)

The Commission **accepts** recommendation 3b. It will base this assessment notably on the information obtained within the final national energy and climate plan to meet the relevant obligations for hydrogen consumption.

Recommendation 4 - Monitor permitting processes in the Member States

The Commission should monitor permitting processes in the Member States and check whether they adhere to the timelines set in various legal acts, potentially including this aspect in the European Semester process.

Target implementation date: end 2025 (or later if the relevant legal acts set deadlines for transposing the legislation into national law that is after the end of 2025)

The Commission **partially accepts** the recommendation. The Commission has established additional guidelines in May 2024 to support Member States in the timely implementation of the deadlines and requirements for permitting processes²¹. The Commission will also check whether the

²¹ Recommendation and guidance on speeding up permit-granting for renewable energy and related infrastructure projects - European Commission (europa.eu)

timelines in the various legal acts are transposed into national legislation. However, the Commission will respect the transposition dates set by the co-legislators in the different directives before completing this check. The Commission cannot monitor every single permitting process in the Member States as part of the European Semester process.

Following the transposition date, the Commission will assess whether Member States have implemented the different legal acts, which are expected to be completed by the end of 2025.

Recommendation 5 - Take a clear decision on support and coordination actions with and for the hydrogen industry

The Commission should do the following:

- (a) Create a one stop shop solution under the European Hydrogen Bank and guide hydrogen project developers on available EU funding.**

(Target implementation date: mid 2025)

The Commission **partially accepts** the recommendation. The European Hydrogen Bank contains a number of different activities, including support for domestic auctions for renewable hydrogen, a mechanism to support the market development for hydrogen as well as a number of European and international support schemes for the development of renewable hydrogen projects.

The Commission proposes to bring information of these activities together in a single website, ensuring cross-linkages between the activities of the different services. The Commission will also take action to make it simpler to access public financing and to guide hydrogen project promoters on EU funding by: 1) publishing on the F&T portal the funding opportunities offered by directly managed programmes relevant for hydrogen; and 2) over time integrating the funding opportunities sponsored by shared management programmes for STEP projects, as it implements the STEP regulation and advances the work on the STEP Portal, which takes up the idea of a one-stop shop, by **end-2025**.

In addition, the pilot mechanism to develop a hydrogen market will serve off-takers and producers to also connect to financial institutions and investors interested in financing hydrogen projects.

- (b) Decide on the future of the Clean Hydrogen Alliance in terms of its scope and number of roundtables and adopt a clear and time-bound mandate for its future work.**

(Target implementation date: mid 2025)

The Commission **accepts** the recommendation. The Commission agrees with the ECA that expectations should be updated, based on latest developments. It considers that the best means to do this would be by adopting a time limited mandate at the latest by mid 2025 (that, if necessary could be renewed) setting out the key objectives and the deliverables that the Alliance and the relevant Roundtables should aim to deliver for the next three years.