



TEN/718
Hydrogen strategy

OPINION

European Economic and Social Committee

**Communication from the Commission to the European Parliament, the Council, the European
Economic and Social Committee and the Committee of the Regions**

A hydrogen strategy for a climate-neutral Europe
[COM(2020) 301 final]

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1. Conclusions and recommendations

- 1.1 The EESC considers that the European Union must overcome the COVID-19 crisis by building a new model for society, one which will make our economies more green, just and resistant to future shocks. European recovery funds must enable businesses, innovators, workers and investors to affirm their role as world leaders in the expanding clean energy markets.
- 1.2 Accordingly, the EESC supports the European Commission's strategy to create an enabling environment to boost supply and demand of hydrogen to deliver a climate-neutral economy. It stresses that clean hydrogen must be prioritised, including by the European Hydrogen Alliance, as this is the only option compatible with climate neutrality.
- 1.3 The EESC would point out that establishing a clean hydrogen economy in Europe is just one strand of the strategy seeking to link up the EU's various energy sectors more effectively. The EESC therefore emphasises that the EU should revise its ambitions upwards to allow for the emergence of a clean energy system, incorporating renewable energy and energy efficiency, so as to provide European businesses with both a solid internal market where innovation can be rolled out safely and an integrated industrial strategy which can export clean energy solutions to the rest of the world.
- 1.4 The EESC notes that due to the high production and transport costs, clean hydrogen should be used only in cases where other decarbonisation options are not possible, for example in sectors where it is difficult to reduce carbon emissions¹ or in some very specific applications in the transport and construction sectors.
- 1.5 The EESC stresses that if clean hydrogen is to take off, European funds should not subsidise fossil fuels, and it calls on the Commission to apply the "do no harm" principle to all public funding under the MFF, InvestEU, the EU Recovery Fund and State aid.
- 1.6 The EESC stresses that establishing a hydrogen economy requires buy-in by Europeans in their role as entrepreneurs, workers or consumers. The EESC feels that it is unfortunate that there has been no discussion on the strategy's implementation in the various sectors and calls for Europeans to be given a greater role in this process by means of direct, representative consultation and participation. The EESC also asks the Commission to assess the impact of developing clean hydrogen on energy costs for households.
- 1.7 The EESC points out that the success of the energy transition will be diluted if some workers lose out or if the most vulnerable are unable to benefit from it. At a time of particularly high unemployment², especially among young people, it is crucial that we harness the full potential for job creation in developing sectors, just as it is vital to ensure that the transition does not drag some regions down into economic decline, generating structural unemployment. The EESC therefore

¹ Also referred to as "hard-to-abate sectors" (e.g. steel, petrochemicals, aluminium, cement and fertilisers), defined as such because decarbonisation is a more costly way of reducing emissions than current technologies with a higher carbon content.

² According to [Eurostat](#) data published in August 2020, COVID-19 reduced employment in the EU by 2.6% in the second quarter.

calls on the European Commission to carry out a study identifying the skills of workers in declining sectors which would be useful for new hydrogen-related jobs.

- 1.8 The EESC emphasises the key role played by the European Clean Hydrogen Alliance in speeding up the transformation of European industries³, and asks to be involved as the representative of organised civil society. The EESC also recommends that the Commission provide a detailed description of the timeframes for transition in each industry, tailored to the specific needs of each sector. The steel, cement and chemicals industries need help to change their production methods; failing that, the EESC points out that these industries – which are making a significant contribution to the reduction of CO₂ emissions – may not survive the transformation.
- 1.9 The EESC welcomes future partnerships with neighbouring countries. However, it calls for greater clarity from the European Commission on the deployment of 40 GW of electrolyzers to produce renewable hydrogen in the EU neighbourhood⁴, which currently includes countries that are politically unstable and have very different energy transition and renewable energy development policies. The EESC also stresses that in its Framework Strategy for a Resilient Energy Union⁵, the Commission sets itself the objective of reducing the EU's dependence on energy imports⁶.
- 1.10 The EESC would also point out that the competitiveness of European businesses is based on their capacity for innovation. Research and innovation also play a key role in bolstering the resilience of our society which has been buffeted by the COVID-19 pandemic. To this end, the EESC stresses the need to provide sufficient budgetary resources for clean energy under Horizon Europe and the European Innovation Council (EIC).

2. **Gist of the European Commission communication**

- 2.1 The Commission reaffirms its ambition to speed up the transition towards a sovereign, competitive climate-neutral economy, at a time when the European economy is being buffeted by the COVID-19 pandemic⁷.
- 2.2 The European Commission points to the key role played by clean hydrogen in creating a sovereign, smarter, more integrated and optimised energy system, in which all sectors can contribute fully to decarbonisation. Clean hydrogen and its value chain can play an important role in offsetting variations in renewable energy flows and supplying sectors which are not suited to electrification. Europe needs to establish a hydrogen economy if it is to realise this potential.

³ I.e. the carbon-free creation of goods and services.

⁴ Including the Western Balkans, Ukraine and the southern neighbourhood countries.

⁵ See COM(2015) 80 final.

⁶ See COM(2020) 299 on *Powering a climate-neutral economy: An EU Strategy for Energy System Integration*.

⁷ The EU GDP shrank by 11.9% in the second quarter of 2020, according to [Eurostat](#), the EU statistics office.

- 2.3 Accordingly, the Commission has presented a three-phase strategy to run until 2050:
- 2020-2024: 6 GW of electrolyzers to produce renewable hydrogen so as to decarbonise existing hydrogen production,
 - 2025-2030: 40 GW in the EU and 40 GW in the countries located near the EU with exports to the EU to decarbonise new applications, such as the steel industry and some forms of transport,
 - 2030-2050: a huge upscale in the capacity installed so that hydrogen can decarbonise all "hard-to abate" sectors⁸.
- 2.4 The Commission is focusing on five key dimensions in its strategy to make renewable hydrogen competitive in the EU:
- investments in the EU,
 - boosting demand and scaling up production,
 - designing the right infrastructure and market rules,
 - supporting research and innovation (R&I),
 - the international dimension.
- 2.5 In order to build this ecosystem, the Commission considers that between EUR 320 bn and 458 bn will have to be invested throughout the current decade in order to meet the hydrogen strategy's 2030 goals: EUR 24 bn to 42 bn on electrolyzers, EUR 220 bn to 340 bn on boosting the production of solar and wind power (80 to 120 GW), around EUR 11 bn on updating existing CCS facilities and EUR 65 bn on hydrogen transport, distribution and storage, and refuelling stations. By 2050, EUR 180 to 470 bn will be needed merely for production capacity. What is more, money will also have to be invested in adapting end-use sectors, such as EUR 160 m to 200 m to convert a typical EU steel plant and EUR 850 m to 1 bn to set up 400 small hydrogen refuelling stations.
- 2.6 The main strategic levers available to the EU to boost private investment in clean hydrogen are described below.
- 2.6.1 Developing clean hydrogen applications in industry and mobility will boost demand. In order to achieve this, the strategy proposes a two-phase approach: first, hydrogen will be used to decarbonise steel production and could be developed in captive uses, such as urban buses or some trains when electrification is not cost competitive, as well as for heavy-duty road vehicles in parallel to electrification. The forthcoming strategy on sustainable development and smart mobility, to be published by the end of the year, should tackle the role of hydrogen in transport. With this in mind, demand support policies will be considered and may take the form of renewable hydrogen quotas or minimum percentages in specific end-use sectors (such as chemical and transport applications).
- 2.6.2 In order to increase production, the Commission emphasises that investors and industry will need greater clarity and certainty. It will therefore propose a common low-carbon standard for the promotion of hydrogen production installations based on their direct greenhouse gas performance. It could also propose a comprehensive terminology and European-wide criteria for the

⁸ Defined as such because the costs of reducing emissions are high and progress has been slow and hesitant.

certification of renewable hydrogen, building on existing initiatives such as CertifHy. Furthermore, the next revision of the EU emissions trading system (EU ETS) should bring in additional mechanisms to encourage the production of renewable and low-carbon hydrogen. The CCfD (Carbon Contract for Difference), a call for long-term contracts with a public counterpart, could be considered to cover the difference between the CO₂ strike price (i.e. EUR 55-90/tCO₂) and the actual CO₂ price. Lastly, direct and transparent market-based support schemes for renewable hydrogen, awarded through calls for tenders, might be considered.

- 2.6.3 The Commission proposes gradually rolling out the infrastructure alongside the roll-out of devices running on clean hydrogen. Initially, demand for hydrogen will be met by on-site or local supply. Subsequently, regional clusters will be developed ("Hydrogen Valleys") leading to a growing need for dedicated infrastructure, not just for industrial and transport applications and electricity balancing but also to heat residential and commercial buildings. The existing gas network could be partly used to carry renewable hydrogen over longer distances and large-scale storage facilities will become necessary.
- 2.6.4 In order to promote the emergence of European champions, the Commission is establishing a European Clean Hydrogen Alliance, a partnership between public authorities, industry and civil society. The goal of this alliance will be 1) to develop an investment programme and a pipeline of projects, 2) to facilitate cooperation in networks of regional, national and European investment projects along the hydrogen value chain, including important projects of common European interest (IPCEI), and 3) to increase financing to help close the investment gap. The alliance should provide a wide forum to coordinate investments by all stakeholders.
- 2.6.5 The Commission intends to support strategic investments in clean hydrogen through its recovery and resilience plan, and particularly through InvestEU's European strategic investment window (from 2021).
- 2.6.6 The Commission will also support research and innovation (R&I) by means of a formal partnership on clean hydrogen and key partnerships on transport and industry, such as 2Zero and Clean Steel. The Commission will provide targeted support for sound projects in the Member States through dedicated instruments (such as InnovFin EDP and InvestEU). An interregional innovation investment instrument with a pilot project on hydrogen in carbon-intensive regions will be financed during the next framework period of the European Regional Development Fund (ERDF).
- 2.6.7 Lastly, in order to be proactive in promoting further opportunities for cooperation on clean hydrogen, the strategy proposes rethinking energy partnerships with neighbouring countries and regions (to the east of the EU, particularly Ukraine, and the southern neighbourhood) through the relevant international bodies, such as the Energy Community and the Clean Energy Ministerial. This will be flanked by investment support, with the neighbourhood investment platform and the Western Balkans Investment Framework. The Commission will develop a benchmark for euro denominated transactions in hydrogen in order to consolidate the role of the euro in trade of sustainable energy, and will incorporate clean hydrogen into the EU's international, regional and bilateral diplomacy on energy, climate, research, trade and international cooperation.

3. General comments

- 3.1. The European Green Deal, which aims to achieve climate neutrality in Europe by 2050, needs tangible policies to become reality. The European Union is also currently facing a dual health and economic emergency triggered by the COVID-19 pandemic. The European Union and the Member States must therefore coordinate their responses to these crises, so that economic recovery can be a springboard for a clean and resilient future. For that future to become reality, the EU's economic sovereignty must be bolstered, partly by developing renewable energy and the relevant storage capacity.
- 3.2. Accordingly, the EESC supports the European Commission's strategy to create an enabling environment to boost supply and demand of hydrogen to deliver a climate-neutral economy. However, it would point out that the success of clean hydrogen depends on a substantial increase in the efficiency of our energy system and massive deployment of renewable energy in order to extend electrification of uses.
- 3.3. Whilst the EESC welcomes the strategy's ambitious targets with regard to the deployment of electrolyzers for the production of renewable hydrogen, it points out that priority must be given to boosting renewable capacity installed in Europe to meet the growing demand for electricity. This is due to the increase in electrification of end uses, plus the electricity needed to produce clean hydrogen. The development of renewable energy does not currently include hydrogen production, and only about a third of the EU's electricity consumption is sourced from renewable energy⁹.
- 3.4. The EESC welcomes the Commission's clarifications regarding the definition of clean hydrogen, defined as being produced through electrolysis using renewable electricity from wind, solar and hydraulic power or the biochemical conversion of renewable biomass. It is pleased that this is a priority for the EU, since it is the only option which is compatible with climate neutrality.
- 3.5. The EESC does however note that the strategy remains open in the short and medium term to other forms of low-carbon hydrogen produced using fossil fuels with carbon capture and storage (CCS)¹⁰, a technology which is still being deployed. The EESC points out that hydrogen with CCS can never be considered a source of green energy if its use is linked to direct or indirect extraction of fossil fuels. The EESC underscores the need to have carbon analysis tools throughout the hydrogen value chain along with CCS in order to be considered low-carbon rather than zero-carbon¹¹ and to avoid a situation where the emissions savings are insufficient to meet the long-term emissions targets.
- 3.6. The EESC would also point out that according to the European Court of Auditors' analyses, EU financing for CCS support, such as NER 300, "has delivered no successful carbon capture and

⁹ Eurostat data [\[nrg_ind_peh\]](#).

¹⁰ Or from electrolysis with a significantly reduced GHG emission life-cycle.

¹¹ This allows for 60 to 85% life-cycle emissions savings compared to using natural gas in boilers.

storage project"¹². There is thus much uncertainty about the technological feasibility of CCS, and little certainty about public support for it.

- 3.7. The EESC takes note of the Commission estimate that carbon prices in the region of EUR 55-90 per tonne of CO₂ would be needed to make fossil-based hydrogen with carbon capture competitive with fossil-based hydrogen. It asks the Commission to describe the financial model for investments leading to this offset cost, particularly the impact of the cost of capital leveraged through private investments which result in projects having a higher price tag. The EESC would ask the Commission to provide details of estimates for the clean hydrogen prices necessary to obviate the need for subsidies and to explore the mechanisms required to achieve these prices, in particular during the forthcoming revision of the EU Emissions Trading System (EU ETS).
- 3.8. The EESC would also point out that whilst renewable hydrogen will have to be able to compete with fossil-based hydrogen and fossil-based hydrogen with carbon capture, most importantly it must be able to compete with fossil fuels. For that, its price must be less than 1 USD/kg¹³. Reducing the investment costs (CapEx) of green hydrogen is therefore key. The EESC asks the European Commission to provide hydrogen price scenarios linked to the cost of financial capital leveraged for green hydrogen projects.
- 3.9. The EESC would also point out that previous attempts to start up a hydrogen economy have failed, chiefly because the demand for hydrogen has never materialised. The EESC is therefore glad that the Commission has clearly identified end-use sectors which will have to use hydrogen: industry and some forms of transport, as well as stationary electricity storage to boost battery storage capacity.
- 3.10. Clean hydrogen should therefore be used only in cases where other decarbonisation options are not possible, and the EESC calls on the Commission to focus investments on applications where hydrogen can play a major role, such as industry, mobility (shipping and aviation) and renewable energy storage. Wherever batteries are operational – particularly for cars, taxis, bus fleets and urban vans and lorries, as mentioned in the strategy – hydrogen is likely to provide less cost-effective solutions. It could also be one of the possible options for decarbonising long-distance road freight¹⁴.
- 3.11. The COVID-19 pandemic has both worsened and widened inequality in our society and increased poverty in Europe. It is therefore important that the hydrogen strategy for a climate-neutral Europe does not leave anyone behind. Accordingly, the EESC asks the Commission to monitor and assess requests for employment restructuring linked to the hydrogen strategy.

¹² Opinion of the European Economic and Social Committee on the *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank – A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy* [OJ C 282, 20.08.2019, p.51](#).

¹³ Hydrogen produced through the reforming of natural gas costs about 1 USD/kg. Source: Platts Hydrogen Assessments.

¹⁴ See the annual [T&E report for 2019](#).

4. Specific comments

The social dimension

- 4.1 Due to the COVID-19 pandemic and the resulting crisis, unemployment is expected to reach 9% in the European Union, hitting young people and unqualified workers particularly badly. The EESC therefore points out how important it is to provide good quality training for workers and how necessary to make the energy sector more attractive to young Europeans. With this goal in mind, the European Union could set up European centres of excellence for apprentices in jobs specific to the energy transition (such as conducting energy audits and installing heat pumps). By granting subsidies and expanding the ErasmusPro programme, the EU could make young Europeans key actors in the energy transition, particularly in the field of clean hydrogen.
- 4.2 Fostering job creation by deploying renewable hydrogen necessarily means providing support for European SMEs, which account for almost two thirds of European private sector, non-financial jobs¹⁵. The EESC calls on the Commission to develop specific financial instruments to support them¹⁶.
- 4.3 The EESC would also point out that in order to make the EU more competitive and resilient, it must keep control of its assets and industries, and address the issue of industrial dumping from other regions of the world.
- 4.4 Lastly, the EESC calls on the EU to make full use of the new, more sustainable business models which are based on dialogue between all stakeholders, including enabling workers to play a strong role in corporate strategy¹⁷.

Investment needs in the EU

- 4.5 The EESC stresses that European funds should not subsidise fossil fuels, calling on the Commission to apply the "do no harm" principle to all public funding under the MFF, InvestEU, the EU Recovery Fund and State aid. At any rate, hydrogen produced directly or indirectly by means of CCS cannot be eligible for the green taxonomy of European financing.
- 4.6 The EESC is very glad that the new recovery and resilience tool supports investments and reforms undertaken by Member States which are crucial for sustainable recovery, particularly in the renewable hydrogen sector. The EESC calls on the Commission to ensure that the Member States' recovery and resilience plans are devised in line with the European Green Deal and the National Energy and Climate Plans. In order to do so, the Commission must make contributing to the green transition a prerequisite when evaluating the Member States' projects.

15 <https://www.touteleurope.eu/actualite/les-entreprises-dans-l-union-europeenne.html> (French only).

16 I.e. regional investment funds, a public guarantee covering 60% of green financing for SME development, and insurance provisions covering SMEs' development risk in the field of green hydrogen.

17 EESC Resolution of 11 June 2020 on EESC proposals for post-COVID-19 crisis reconstruction and recovery [OJ C 311, 18.09.2020, p.1](#).

4.7 The Clean Hydrogen Alliance will play a pivotal role in the deployment of hydrogen in Europe, not least by drawing up the investment programme and the regional, national and European project pipeline. The EESC therefore emphasises just how important it is to ensure that all stakeholders are represented fairly, including civil society in all its dimensions, workers and non-governmental organisations. As it stands at present, it is largely made up of private actors¹⁸. The EESC genuinely represents organised civil society, and as such it must play a part in the discussions and consultations.

Boosting demand and stepping up production

4.8 The EESC is convinced that auctions in Carbon Contracts for Difference (CCfDs) play an important role in ensuring that industrial processes are rapidly converted to hydrogen. CCfDs can send a positive signal to investors and industry¹⁹. However, the EESC would like to highlight the following two points.

4.8.1 Whilst emphasising the pertinence of CCfDs, the Commission acknowledges that the EU ETS in its present form is not able to send price signals strong enough to trigger the investments needed to achieve climate neutrality. This is partly due to the fact that there are still high subsidies for fossil raw materials in the EU. According to the European Commission's report on energy subsidies, subsidies for natural gas used to produce hydrogen with carbon capture and storage (CCS) have actually increased²⁰. This has therefore created a massive market distortion, hindering investment in climate protection technologies such as green hydrogen or making them unnecessarily expensive. Moreover, even after being reformed, the EU ETS still does not reflect the true carbon price. If subsidies for fossil raw materials were scrapped and if the ETS were further improved, there would be no need for CCfDs. These two tasks should therefore be the Commission's top priority.

4.8.2 As CCfDs are nevertheless necessary, tenders should be framed in such a way that hydrogen electrolysis will only be financed if surplus renewable electricity is used for this purpose²¹. The EESC therefore stresses that a European funding system and specific calls for tenders for renewable hydrogen are essential to ensure that the development of hydrogen involving carbon capture and storage (CCS) is not slowed down.

The international dimension

4.9 The EESC questions the justification for developing future energy partnerships which aim to deploy 40 GW of electrolysers to produce renewable hydrogen in the countries located near the

¹⁸ See the Clean Hydrogen Alliance's [list of members](#).

¹⁹ These auctions have contributed to the development of offshore wind energy in the UK as they made it possible [to achieve low bids](#).

²⁰ See Annex 2 to COM(2020) 950 final.

²¹ For example, if an electrolyser operator shows that it receives electricity for electrolysis directly from a newly-built renewable energy plant, or has an electricity supply contract that is activated only when wholesale market prices are negative.

EU²². At a time when the leaders of the Member States are calling for stronger European sovereignty, the EESC urges the Commission to develop a coherent approach.

- 4.10 The EESC also flags up how difficult it is to attract European investors in politically unstable countries. The EESC would nonetheless recommend that the Western Balkan countries on the path to EU membership be included in all discussions and initiatives related to the implementation of the hydrogen strategy.
- 4.11 The EESC also calls on the Commission to provide more details on the capacity of these countries to develop these future partnerships, since the strategy currently refers to a very wide range of countries (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine²³, Syria and Tunisia) which have widely diverging policies on energy transition and the development of renewable energy. In these countries, the arrangements for financial support for SMEs recommended by the EESC must also be given priority, given the high proportion of SMEs in these countries and the considerable level of banking intermediation.
- 4.12 The EESC questions whether these countries have the capacity to deploy sufficient numbers of electrolyzers to produce enough renewable hydrogen to meet European as well as domestic demand. In North Africa and Ukraine, deploying 40 GW would require 76 GW of renewable energy by 2030, tripling the capacity of these countries in a decade²⁴.

Brussels, 27 January 2021

Christa SCHWENG

The president of the European Economic and Social Committee

22 Including the Western Balkans, Ukraine and the southern neighbourhood countries.

23 This designation must not be construed as recognition of a State of Palestine and is without prejudice to the individual positions of the Member States on this issue.

24 https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/May/SDG7Tracking_Energy_Progress_2020.pdf.