



2020/2242(INI)

19.11.2020

DRAFT REPORT

on a European Strategy for Hydrogen
(2020/2242(INI))

Committee on Industry, Research and Energy

Rapporteur: Jens Geier

CONTENTS

	Page
MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION.....	3
EXPLANATORY STATEMENT	9
ANNEX: LIST OF ENTITIES OR PERSONS FROM WHOM THE RAPPORTEUR HAS RECEIVED INPUT	13

MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION

on a European Strategy for Hydrogen (2020/2242(INI))

The European Parliament,

- having regard to the Treaty on the Functioning of the European Union (TFEU), and in particular to Article 194 thereof,
- having regard to the Agreement adopted at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21) in Paris on 12 December 2015 (the Paris Agreement),
- having regard to the Commission communication of 8 July 2020 entitled ‘A hydrogen strategy for a climate-neutral Europe’ (COM(2020)0301),
- having regard to the Commission communication of 8 July 2020 entitled ‘Powering a climate-neutral economy: An EU Strategy for Energy System Integration’ (COM(2020)0299),
- having regard to the Commission report of 14 October 2020 entitled ‘2020 report on the State of the Energy Union pursuant to Regulation (EU) 2018/1999 on Governance of the Energy Union and Climate Action’ (COM(2020)0950),
- having regard to the Commission communication of 17 September 2020 entitled ‘Stepping up Europe’s 2030 climate ambition - Investing in a climate-neutral future for the benefit of our people’ (COM(2020)0562),
- having regard to the Commission communication of 11 December 2019 on the European Green Deal (COM(2019)0640),
- having regard to the Commission communication of 10 March 2020 entitled ‘A New Industrial Strategy for Europe’ (COM(2020)0102),
- having regard to Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources¹,
- having regard to Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and

¹ OJ L 328, 21.12.2018, p. 82.

- of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council²,
- having regard to Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure³,
 - having regard to Council Regulation (EU) No 559/2014 of 6 May 2014 establishing the Fuel Cells and Hydrogen 2 Joint Undertaking⁴,
 - having regard to Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009⁵,
 - having regard to Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013 establishing the Connecting Europe Facility, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010⁶, which is currently being revised,
 - having regard to Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC⁷,
 - having regard to its resolution of 10 July 2020 on a comprehensive European approach to energy storage⁸,
 - having regard to its resolution of 15 January 2020 on the European Green Deal⁹,
 - having regard to its resolution of 14 March 2019 on ‘Climate change – a European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy in accordance with the Paris Agreement’¹⁰,
 - having regard to its resolution of 25 October 2018 on ‘Deployment of infrastructure for alternative fuels in the European Union: time to act!’¹¹,
 - having regard to its resolution of 6 February 2018 on accelerating clean energy innovation¹²,
 - having regard to Rule 54 of its Rules of Procedure,

² OJ L 328, 21.12.2018, p. 1.

³ OJ L 307, 28.10.2014, p. 1.

⁴ OJ L 169, 7.6.2014, p. 108.

⁵ OJ L 115, 25.4.2013, p. 39.

⁶ OJ L 348, 20.12.2013, p. 129.

⁷ OJ L 275, 25.10.2003, p. 32.

⁸ Texts adopted, P9_TA(2020)0198.

⁹ Texts adopted, P9_TA(2020)0005.

¹⁰ Texts adopted, P8_TA(2019)0217.

¹¹ OJ C 345, 16.10.2020, p. 80.

¹² OJ C 463, 21.12.2018, p. 10.

- having regard to the opinions of the Committee on the Environment, Public Health and Food Safety and the Committee on Transport and Tourism,
 - having regard to the report of the Committee on Industry, Research and Energy (A9-2242/2020),
- A. whereas the EU has endorsed the Paris Agreement, the Green Deal and the goal of achieving a cost-efficient and fair transition leading to climate neutrality by 2050;
 - B. whereas the transition to a net-zero greenhouse gas economy requires a clean energy transition that ensures sustainability, security of supply and affordability of energy;
 - C. whereas hydrogen can be used for industrial, transport and heating applications, decarbonising sectors in which direct electrification is not possible or competitive, as well as for energy storage to balance the energy system, thereby playing a significant role in energy system integration;
 1. Stresses the need to maintain and further develop European technological leadership in clean hydrogen¹³ through a competitive and sustainable hydrogen economy with an integrated hydrogen market; emphasises the necessity of a European hydrogen strategy that covers the whole hydrogen value chain, including the demand and supply sectors, and is coordinated with national efforts to bring down the costs of clean hydrogen; welcomes, therefore, the hydrogen strategy for a climate-neutral Europe proposed by the Commission;
 2. Underlines that the ‘energy efficiency first’ principle prevails and that direct electrification, where possible, is the preferable option for decarbonisation as it is more cost- and energy-efficient than the use of clean hydrogen;
 3. Is convinced that only clean hydrogen is sustainably contributing to achieving climate neutrality in the long term;

Hydrogen classification and standards

4. Believes that a common legal classification of the different types of hydrogen is of utmost importance; welcomes the classification proposed by the Commission; notes that avoiding two names for the same category, such as ‘renewable’ and ‘clean’ hydrogen, could further clarify that classification;
5. Underlines the urgent need for European standards, certification and labelling systems for clean hydrogen and guarantees of origin for renewable electricity; believes that clean hydrogen should be determined according to an independent, science-based review of its lifecycle emissions; calls on the Commission to provide a regulatory framework as early as possible in 2021;
6. Is strongly convinced that public acceptance is key to the successful creation of a hydrogen economy; stresses, therefore, the importance of public and stakeholder

¹³ According to the Commission, ‘clean hydrogen’ refers to hydrogen produced through electrolysis of water with electricity from renewable sources. It may also be produced through reforming of biogas or biochemical conversion of biomass, if in compliance with sustainability requirements.

involvement and European safety and technical standards for hydrogen, and high-quality hydrogen solutions respecting those standards;

Ramping up hydrogen production

7. Welcomes the Commission's ambitious goals of increasing the capacity of renewable hydrogen electrolyzers and hydrogen production; urges the Commission and the Member States to incentivise the value chain and market uptake of clean hydrogen in order to make it technologically mature and competitive with fossil-based and low-carbon hydrogen¹⁴;
8. Highlights that for a functioning and predictable internal hydrogen market, regulatory barriers need to be overcome and a coherent and comprehensive regulatory framework created; believes that the gas market regulatory framework and the Clean Energy Package could serve as blueprints for that purpose;
9. Notes that, in order to build up a sustainable hydrogen economy fast enough to reach our climate goals, low-carbon hydrogen can play a transitional role; calls on the Commission to assess for how long and how much of this hydrogen would be needed approximately for decarbonisation purposes until solely clean hydrogen can play this role;
10. Underlines that a clean hydrogen economy requires significant additional amounts of affordable renewable energy and the corresponding infrastructure; calls on the Commission and the Member States to step up their efforts in this regard and to abolish taxes and levies on renewable electricity;

Hydrogen infrastructure

11. Emphasises the timely need for hydrogen production and transport infrastructure and the parallel development of demand and supply; welcomes, in this respect, the Commission's intention to review Regulation No 347/2013 of 17 April 2013 on guidelines for trans-European energy infrastructure (the TEN-E Regulation)¹⁵; notes that, despite the concentration on industrial clusters in the first phase, the planning of infrastructure for transmission over longer distances and its regulation should already be undertaken;
12. Encourages the Commission and the Member States to assess the possibility of repurposing existing gas pipelines for the transport of pure hydrogen in order to maximise cost efficiency and minimise investment costs and levelised costs of transmission;

Hydrogen demand

13. Highlights that, in order to achieve a fast market uptake of clean hydrogen and to avoid carbon lock-ins, demand for clean hydrogen must increase; acknowledges that

¹⁴ According to the Commission, 'low-carbon hydrogen' encompasses fossil-based hydrogen with carbon capture and electricity-based hydrogen, with significantly reduced full life-cycle greenhouse gas emissions compared to existing hydrogen production.

¹⁵ OJ L 115, 25.4.2013, p. 39.

the initial focus of hydrogen demand should be on sectors for which the use of hydrogen is close to competitive or that currently cannot be decarbonised by other means; believes that for these sectors roadmaps for demand development, investment and research needs should be established at European level; agrees with the Commission that demand-side policies such as quotas for the use of clean hydrogen in specific sectors and carbon contracts for difference ('CCfD') are necessary to promote decarbonisation through clean hydrogen;

Research, development, innovation and financing

14. Stresses the importance of research, development and innovation along the whole value chain and of demonstration projects on an industrial scale in order to make clean hydrogen competitive; believes that involving SMEs and equipping workers with adequate knowledge about hydrogen are of the utmost importance;
15. Underlines that significant amounts of investment are needed to make clean hydrogen competitive, and that European programmes and financing instruments such as Horizon Europe, the Connecting Europe Facility, InvestEU and the ETS Innovation Fund have a key role in fostering a clean hydrogen economy; deeply deplores the Council's cuts affecting these instruments; calls on the Commission to develop a coordinated investment strategy for clean hydrogen;
16. Welcomes the European Clean Hydrogen Alliance and the Important Projects of Common European Interest (IPCEIs) as important means to enhance investment in clean hydrogen; encourages the Alliance to come up with an investment agenda and a project pipeline that can ensure the implementation of the hydrogen goals set by the Commission as soon as possible; welcomes the Commission's plan to revise the State aid guidelines to include clean hydrogen;
17. Stresses the work of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU); asks the Commission to use it as a competence centre for clean hydrogen;

International cooperation on hydrogen

18. Believes that the importing of clean hydrogen may become necessary to cater to European demand; calls on the Commission to establish mutually beneficial cooperation with neighbouring regions;
19. Is convinced that the EU should try to promote its standards on hydrogen internationally and thus make hydrogen a part of its international cooperation;

The role of hydrogen in an integrated energy system

20. Underlines the need for an integrated energy system in order to achieve climate neutrality by 2050; believes that the integration of the electricity, gas and hydrogen grid is beneficial for a well-functioning hydrogen and energy market; welcomes the inclusion of hydrogen in the Commission's Strategy for Energy System Integration; believes that clean hydrogen can play a key role in terms of energy storage to balance intermittent renewable energy supply and demand;

-
- ◦

21. Instructs its President to forward this resolution to all EU institutions and the Member States.

EXPLANATORY STATEMENT

The European Union has endorsed the Paris Agreement and has committed with the European Green Deal to achieve climate neutrality by 2050 through a just transition. This transition implies the decarbonisation of all economic sectors, including the energy and hard-to-decarbonise sectors. The transition towards a clean energy system needs to ensure security of supply and affordability of energy.

As hydrogen produced through electrolysis with electricity from renewable energy sources is a clean alternative to fossil fuels and can be used for various purposes, including feedstock for industrial processes, fuel cells and energy storage, it can make a valuable contribution to this transition. It can help to decarbonise hard-to-decarbonise sectors in which direct electrification is not yet possible or cost-efficient. However, hydrogen represents only a small part of the European energy mix and 95% of our hydrogen production is currently based on fossil fuels¹. Furthermore, clean hydrogen is not yet competitive with fossil-based hydrogen and low-carbon hydrogen².

Thus, the EU needs to develop a sustainable hydrogen economy that aims at making clean hydrogen competitive as soon as possible. A successful hydrogen economy with European technological leadership could help the EU to strengthen its economy and create future-proof jobs, especially after the economic downturn due to the COVID-19 pandemic. For this, a hydrogen strategy that covers the whole hydrogen value chain, includes demand and supply sectors and coordinated with national efforts, is necessary. The European Commission has made a first step in this direction by adopting ‘A hydrogen strategy for a climate-neutral Europe’ in July 2020. This report aims at analysing the political, economic and technological needs for a sustainable hydrogen economy in the EU, thereby complementing the strategy proposed by the Commission.

The Rapporteur underlines that hydrogen is not the silver bullet solution to decarbonisation. Instead, the ‘energy efficiency first principle’ should prevail and direct electrification should be considered the preferable option for decarbonisation, where technologically and economically possible, as it can be more cost- and energy-efficient due to efficiency losses in hydrogen production.

The EU needs to base its hydrogen economy on clean hydrogen, as only clean hydrogen is sustainable in the long term. In order to ramp up hydrogen production and establish the clean hydrogen economy fast enough to achieve our climate goals, low-carbon hydrogen can play a transitional role, as clean hydrogen is not yet sufficiently abundant and competitive. The Commission should assess for how long and how much low-carbon hydrogen would be needed during this transitional phase. It is important that fossil-based hydrogen is phased out as soon as possible.

¹ European Commission: Hydrogen generation in Europe: Overview of key costs and benefits, July 2020
<https://op.europa.eu/en/publication-detail/-/publication/7e4afa7d-d077-11ea-adf7-01aa75ed71a1/language-en>

² In this report, the Rapporteur is using for the different types of hydrogen the terminology proposed by the Commission in the Communication “A hydrogen strategy for a climate-neutral Europe”.

Hydrogen classification and standards

The Rapporteur believes that, in order to define the different types of hydrogen, a single European classification system is needed. The Commission's proposed classification, based on the carbon content of hydrogen and stepping away from the commonly used colour-based approach, seems to be a good solution. However, different names for the same type of hydrogen, such as 'renewable' and 'clean' hydrogen, should be avoided.

In addition, we need to be able to clearly identify clean hydrogen. For this purpose, the Rapporteur suggests the development of standards and a European certification and labelling system based on an independent science based review of the lifecycle emissions of hydrogen production. As clean hydrogen production is based on renewable electricity, we also need guarantees of origin for renewable electricity. These elements are important for hydrogen consumers to be able to invest consciously in clean hydrogen options.

Public acceptance is key to developing a sustainable hydrogen economy. In order to increase public acceptance, citizen and stakeholder involvement in the hydrogen economy is crucial. We also need to ensure that the EU has the highest safety standards and technical norms for hydrogen and applies only hydrogen solutions that respect those standards. In this regard, the Rapporteur commends the work on safety already done by the Fuel Cells and Hydrogen Undertaking that could serve as a competence centre on hydrogen for the European Commission.

Ramping up hydrogen production

We need to take action now to increase clean hydrogen production in Europe. The Commission presented in its strategy ambitious goals for scaling up the production of clean hydrogen by increasing the capacity of renewable hydrogen electrolyzers. To achieve those goals and establish a functioning and predictable clean hydrogen market that attracts investments, regulatory barriers need to be overcome and a comprehensive regulatory framework of the hydrogen market needs to be put in place. The EU gas market regulatory framework, due the common features of hydrogen and gas, and the Clean Energy Package, due to its holistic approach to reviewing the functioning of the energy market, could serve as blueprints for this regulatory framework.

In order to produce clean hydrogen, significant amounts of renewable electricity are required. Hence, in order to ramp up clean hydrogen production, the EU needs to create sufficient additional renewable energy production. This goes hand in hand with providing the necessary infrastructure to transport renewable energy to hydrogen production sites. As there are still gaps in the renewable energy infrastructure within the EU, the Commission and the Member States should ensure that the missing infrastructure is provided as soon as possible. In addition, as renewable electricity is responsible for a significant part of clean hydrogen production costs, it is important, in order to achieve competitiveness, to reduce costs by abolishing taxes and levies on renewable electricity.

Hydrogen infrastructure

The Rapporteur notes the lack of hydrogen infrastructure in the EU. The EU should avoid a chicken and egg problem between hydrogen infrastructure, production facilities and demand.

We need to develop all elements from the start. The EU should incentivise infrastructure development, e.g. by revising the TEN-E Regulation. The Rapporteur agrees with the Commission's approach to start planning the medium range and backbone transmission infrastructure from the start to develop a fully-fledged internal hydrogen market as soon as possible.

As the establishment of a hydrogen economy will require significant amounts of investment, cost-efficiency is important. The existing gas infrastructure could be repurposed for pure hydrogen use, which could minimise investment costs and levelised costs of transmission. Hence, this possibility should be assessed at European and national level.

Hydrogen demand

The demand side is a crucial aspect for developing a clean hydrogen market, as high demand can speed up market uptake of clean hydrogen. In addition, it can contribute to decarbonisation. However, for demand to increase, clean hydrogen needs to become an attractive business case. Investments into clean hydrogen need to be more attractive than investments into fossil-based solutions. Only then, the EU would be able to prevent carbon lock-ins. Thus, the use of clean and, for a transitional period, low-carbon hydrogen should be concentrated on sectors for which the use of hydrogen is close to competitive or that currently cannot be decarbonised by other means.

In order to have a better oversight of the clean and low-carbon hydrogen needed, the Rapporteur proposes to draw up sector roadmaps that lay out the development of hydrogen demand and investment and research needs for the demand sectors. These roadmaps should be drafted on a European level in close cooperation between stakeholders and European institutions.

The Commission states in its strategy the importance of policies to support and develop the demand-side. Due to the current lack of competitiveness of clean hydrogen, we should indeed consider putting in place policies such as quotas for the use of clean hydrogen in the focus sectors. Innovative measures such as carbon contracts for difference ('CCfD') should also be taken into account. The Commission needs to detail, however, how such measures could be financed and implemented.

Research, development, innovation and financing

In order to reduce costs of clean hydrogen and for optimisation purposes, research, development and innovation along the whole value chain of clean hydrogen are necessary. We also need demonstration projects on an industrial scale to be able to implement hydrogen solutions in demand sectors. The EU needs to ensure the full involvement of SMEs, as some can deliver innovative solutions and some may have limited resources to benefit from clean hydrogen solutions for their own decarbonisation. We also need to ensure that our workforce is equipped with adequate knowledge on clean hydrogen technologies to ensure their safety.

The Rapporteur underlines the high investment needs to establish a clean hydrogen economy. European programmes can play an important role to help financing clean hydrogen projects and to attract additional public and private investments. Especially, Horizon Europe, the Connecting Europe Facility, InvestEU and the ETS Innovation Fund can foster a clean hydrogen economy. It is imperative that those programmes are equipped with sufficient financial resources. Thus,

the Rapporteur deplores the financial cuts by the Council compared to the Commission's proposal.

Besides those programmes, the Clean Hydrogen Alliance and Important Projects of Common European Interest (IPCEIs) can help to finance the hydrogen economy. The Alliance, based on the expertise it unites, should help to identify concrete promising projects and investment needs drawing up a project pipeline and an investment agenda. In addition, a revision of State aid guidelines should establish a chapter on clean hydrogen technologies, so that the guidelines can support and not hamper clean hydrogen development. In addition, considering the abundance of European programmes that can help to finance clean hydrogen, it is essential that the EU develops a coordinated investment strategy that allows projects to receive funding from different programmes and makes sure that they logically build on each other.

International cooperation on hydrogen

The Rapporteur believes that European production of clean hydrogen alone may not suffice to cater to European demand, as some sectors will require large amounts for decarbonisation purposes. Therefore, the EU should start cooperation on clean hydrogen production with neighbouring regions like the Balkans or North Africa for import purposes. It should guarantee that such cooperation is beneficial for the cooperating regions in terms of their fight against climate change and to achieving the UN Sustainable Development Goals and sustainable economic development.

Clean hydrogen should also become an integral part of the EU's international cooperation in general, including climate diplomacy, to exchange best practices and promote European hydrogen standards.

The role of hydrogen in an integrated energy system

Finally, the Rapporteur underlines the importance of an integrated energy system to promote renewable energy and to achieve climate neutrality by 2050. For this purpose, the gas, electricity and hydrogen grids should be coordinated. Here, hydrogen can play a key role in terms of energy storage to balance intermittent renewable energy supply and demand. This solution is not competitive yet and the EU needs further investments for this purpose. The Rapporteur welcomes the alignment of the hydrogen and the energy system integration strategies.

**ANNEX: LIST OF ENTITIES OR PERSONS
FROM WHOM THE RAPPOREUR HAS RECEIVED INPUT**

The following list is drawn up on a purely voluntary basis under the exclusive responsibility of the rapporteur. The rapporteur has received input from the following entities or persons in the preparation of the draft report:

Entity and/or person
Amprion
Bundesverband der Energie- und Wasserwirtschaft
Bundesverband Deutscher Industrie
Bundesverband Energiespeicher
Cefic
CEPS Energy Climate House
Deutsche Industrie- und Handelskammer
Deutsche Umwelthilfe
E3G
EnBW
Energy Storage Association
ENTSO-E
E.on
Eurogas
European Commission
European Committee of the Regions
Europex
European University Institute
Fuel Cells and Hydrogen Joint Undertaking
Hydrogen Europe
Iberdrola
International Association of Oil and Gas Producers
International Energy Agency
Oersted
Open Grid Europe
RWE
Sandbag
Siemens
STEAG
TenneT
Transport & Environment
Uniper
Vattenfall
Verband der Chemischen Industrie
Verbund
Weltenergierat Deutschland
WindEurope
Wirtschaftsvereinigung Stahl
Zero Emissions Platform