

FSR Policy Workshop**A TARGET MODEL FOR HYDROGEN****24 January 2025**

Sala Europa and Online - Villa Schifanoia, Via Boccaccio 121 - Florence

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The Hydrogen Strategy^[1] defined by the European Commission in July 2020 outlined “*many reasons why hydrogen is a key priority to achieve the European Green Deal and Europe’s clean energy transition. Renewable electricity is expected to decarbonise a large share of the EU energy consumption by 2050, but not all of it. Hydrogen has a strong potential to bridge some of this gap, as a vector for renewable energy storage, alongside batteries, and transport, ensuring back up for seasonal variations and connecting production locations to more distant demand centres*”. In its strategic vision for a climate-neutral EU published in November 2018^[2], the share of hydrogen in Europe’s energy mix was projected to grow to 13-14% by 2050^[3] (to be compared with its share below 2% in 2022^[4]).

The same Hydrogen Strategy set “*a strategic objective to install at least 40 GW of renewable hydrogen electrolyzers by 2030 and the production of up to 10 million tonnes of renewable hydrogen in the EU*”^[5]. The REPowerEU Plan^[6] complemented this objective with a target of 10 million tonnes of renewable hydrogen imports by 2030. Neither of these ambitions have been so far transposed into binding targets.

However, the REPowerEU Plan also indicated that “*to facilitate the import of up to 10 million tonnes of renewable hydrogen, the Commission will support the development of three major hydrogen import corridors via the Mediterranean, the North Sea area and, as soon as conditions allow, with Ukraine*”.



Moreover, the latest 2023 list of Projects of Common Interest, the first one adopted after the recast of the TEN-E Regulation^[7], included 65 hydrogen and electrolyser projects. At the same time, an increasing group of energy infrastructure operators, under the European Hydrogen Backbone (EHB) initiative, have been looking at and proposing how a EU-wide hydrogen network could be developed, mostly by repurposing gas infrastructure no longer used in the future. The latest (EHB) report^[8] highlights a set of 40 projects managed by the EHB's TSO members, representing 31.500 km of hydrogen pipelines with expected commissioning prior to 2030.

The 2020 Hydrogen Strategy already recognised that, *“as EU Member States have different potential for the production of renewable hydrogen, an open and competitive EU market with unhindered cross-border trade has important benefits for competition, affordability, and security of supply”*. Therefore, the Hydrogen Strategy called for a liquid market with commodity-based hydrogen trading, which would facilitate entry of new producers and would be beneficial for deeper integration with other energy carriers, and hydrogen infrastructure accessible to all on a non-discriminatory basis.

However, so far the hydrogen sector seems to be developing at a lower pace than initially expected and what would be required to meet the EU's ambitions, and mostly at the local level.

The European Hydrogen Markets Monitoring Report^[9] published by ACER in November 2024 indicates that *“so far renewable hydrogen uptake in industry and transport has increased slowly, making it challenging to reach the EU target”*. In fact, *“the total installed capacity of electrolysers in Europe is currently just over 200 MW. Projects accounting for another 1.8 GW of capacity, mostly captive to a single off-taker or industry, are under construction and expected to become operational by the end of 2026. Projects accounting for around 60 GW of capacity announced as being operational by 2030 are waiting for the final investment decision (FID). Although funding instruments are becoming increasingly available, the actual deployment of these projects remains at risk due to sector uncertainties, in particular the evolution of demand and renewable hydrogen cost prospects”*.

Moreover, all seven projects which were allocated support at the first auction of the European Hydrogen Bank earlier this year envisage the production of renewable hydrogen for local consumption (possibly for the production of ammonia), or in the same industrial complex, with only one project including a pipeline of 221km.

As indicated by ACER, there appears to be significant uncertainty as to the way in which and the pace at which the hydrogen sector will develop, and in particular if and at which stage it will transform from being characterised by largely local markets to a fully integrated EU-wide market, or to some intermediate structure.

While renewable hydrogen is poised to play a key role in decarbonizing hard-to-abate sectors and processes, where electrification of energy demand is either technically infeasible or too expensive, technological developments might widen the scope for electrification of energy demand, at which point the competition between renewable electricity and renewable hydrogen will become one of cost competitiveness. As renewable hydrogen will, for the foreseeable future, be mostly produced in electrolysers using renewable electricity, renewable hydrogen will involve one additional energy transformation, with its associated energy losses. Therefore, the competition between these two energy vector would also have to consider the comparative efficiency in their final uses. Moreover, as the 2030 EU target of 10 million tonnes of renewable hydrogen production needs around three quarters of the renewable electricity currently produced in the EU, massive investments in renewable electricity generation and in electricity networks to connect renewable electricity plants and electrolysers are required.

Faced with these uncertainties, regulators in the EU are looking at the hydrogen sector with great prudence: *“investment decisions on repurposing [of gas infrastructure to transport pure hydrogen] should follow a prudent and no-regrets approach, based on credible scenarios for market hydrogen developments”*^[10].

The recent ACER Report also stresses the lack of consistency among the national approaches to the hydrogen sector regulation. The situation should improve once the provisions of the Hydrogen and Gas Decarbonisation Package^[11] are implemented or transposed into national legislation.

In any case, what seems to be still missing is a shared vision as to the way in which the hydrogen sector could develop and the corresponding infrastructure needs. In the past, 'Target Models' were developed for both the

electricity and gas sectors and markets in Europe. While very different in their shapes and not formally adopted and legally binding, these target models served as a reference for policy and regulatory developments.

Against this context, the Workshop will consider whether a target model for hydrogen could be defined, which could serve as a reference for the development of the hydrogen market and the related infrastructure requirements.

For this purpose, the Workshop will be structured in three sessions:

- **Session I**, in the morning, will focus on the prospects for hydrogen demand and supply, the cost competitiveness of renewable and low-carbon hydrogen and the role that it can play in decarbonising energy demand;
- **Session II**, also in the morning, will explore which market design and trading arrangements are best suited to support the development of the hydrogen sector, as resulting from the previous session;
- **Session III**, in the afternoon, will look at the implications of the development of demand and supply and the market design and trading arrangements outlined in the previous sessions, for the development of the hydrogen network.

Sustainability assessment

The FSR assesses the sustainability and carbon footprint of all its Workshops of the Regulatory Policy Workshop Series. This Workshop is run 'in presence' to promote more effective interaction and discussion. Participants travelling to Florence by car or by air will be encouraged to offset any carbon emissions related to their travel. It is considered that, in this way, a suitable balance is achieved between the effectiveness of the policy dialogue and the net carbon footprint of the event.

[1] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, A hydrogen strategy for a climate-neutral Europe, Brussels, 7.8.2020, COM(2020) 301 final.

[2] 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, Brussels 28.11.2028, COM(2018) 773 final.

[3] Considering hydrogen consumption for energy purposes only, the shares in different scenarios range from less than 2% to more than 23% in 2050 (Moya et al. 2019, JRC116452).

[4] Cfr.
https://energy.ec.europa.eu/topics/energy-systems-integration/hydrogen_en#:~:text=In%202022%2C%20hydrogen%20accounted%20for,significant%20amounts%20of%20CO2%20emissions.

[5] Up to 333 TWh of renewable hydrogen could be produced by either directly connecting renewable electricity to the electrolyzers, or by ensuring that certain conditions are met, including the additionally of the renewable electricity used.

[6] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, REPowerEU Plan, Brussels, 18.5.2022, COM(2022) 230 final.

[7] Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013.

[8] European Hydrogen Backbone, Implementation Roadmap — Cross Border Projects and Costs Update, November 2023, available at: <https://ehb.eu/files/downloads/EHB-2023-20-Nov-FINAL-design.pdf>.

[9] ACER, European hydrogen markets, 2024 Market Monitoring Report, 19 November 2024.

[10] ACER, Transporting Pure Hydrogen by Repurposing Existing Gas Infrastructure: Overview of existing studies and reflections on the conditions for repurposing, 16 July 2021, available at: https://www.acer.europa.eu/sites/default/files/documents/Publications/Transporting%20Pure%20Hydrogen%20by%20Repurposing%20Existing%20Gas%20Infrastructure_Overview%20of%20studies.pdf.

[\[11\]](#) The Package includes Directive (EU) 2024/1788 of the European Parliament and of the Council of 13 June 2024 on common rules for the internal markets for renewable gas, natural gas and hydrogen, amending Directive (EU) 2023/1791 and repealing Directive 2009/73/EC (recast) and Regulation (EU) 2024/1789 of the European Parliament and of the Council of 13 June 2024 on the internal markets for renewable gas, natural gas and hydrogen, amending Regulations (EU) No 1227/2011, (EU) 2017/1938, (EU) 2019/942 and (EU) 2022/869 and Decision (EU) 2017/684 and repealing Regulation (EC) No 715/2009 (recast).

Draft Programme

- 09.00 – 09.10 Welcome and introductory remarks
Leonardo Meeus | Florence School of Regulation
- Introduction to the Workshop
Alberto Pototschnig | Florence School of Regulation
- 09.10 – 09.20 The EU strategy on hydrogen
Zsuzsanna Szeles | DG ENER
- 09.20 – 09.30 The current state of the hydrogen market
Csilla Bartok | Head of Department, Gas, Hydrogen and Retail, ACER

SESSION I – SUSTAINABLE HYDROGEN: DEMAND AND SUPPLY PROSPECTS

Moderator: **Alberto Pototschnig** | Florence School of Regulation

- 09.30 – 09.40 Opening presentation
Marzia Sesini | Florence School of Regulation
- 09.40 – 10.25 The prospects for hydrogen in decarbonising energy demand
Andreas Tirez | Febeliec
Daniele Agostini | Eurelectric
Daniel Fraile | Hydrogen Europe
- 10.25 – 10.45 Roundtable of representatives of FSR Donors and general discussion
Giulia Branzi | Snam
Oliver Altenhoff | Open Grid Europe
Camille Alleguede | EDF
- 10.45 – 11.15 Coffee Break

SESSION II – HYDROGEN TRADING: WHICH MARKET DESIGN?

Moderator: **Ilaria Conti** | Florence School of Regulation

- 11.15 – 11.25 Opening presentation
Andris Piebalgs | Florence School of Regulation
- 11.25 – 11.55 Trading hydrogen: market design and liquidity
Doug Wood | Energy Traders Europe
- 11.55 – 12.15 Roundtable of representatives of FSR Donors and general discussion
Luis Ignacio Parada | Enagas
- 12.30 – 13.15 Lunch Break

SESSION III – NETWORK INFRASTRUCTURE TO SUPPORT THE DEVELOPMENT OF THE HYDROGEN SECTOR

Moderator: **Marzia Sesini** | Florence School of Regulation

- 13.15 – 13.25 Opening presentation
Alberto Pototschnig | Florence School of Regulation
- 13.25 – 14.10 The hydrogen infrastructure to support the hydrogen sector: which model?
Gideon Saunders | European Hydrogen Backbone Initiative
Pedro Verdelho | ACER Gas Working Group
Abel Enriquez Rodriguez | ENNOH
- 14.10 – 14.40 Roundtable of representatives of FSR Donors and general discussion
Oliver Altenhoff | Open Grid Europe
Arno Bux | GIE
Giulia Branzi | Snam
Luis Ignacio Parada | Enagas
- 14.40 – 15.00 Concluding remarks
Leonardo Meeus | Florence School of Regulation
Alberto Pototschnig | Florence School of Regulation