

Hydrogen – central pillar of future energy regulation

Hydrogen Europe welcomes the European Commission's objective to fully align energy markets to the ambitions of the Green Deal. Indeed, the EU Strategy for Energy System Integration and the Hydrogen Strategy set ambitious targets with a view to developing a secure, safe and affordable hydrogen economy in Europe. However, the current hydrogen policy and regulatory elements are distributed over gas, electricity, fuels, emissions and industrial frameworks, with limited overarching coordination. Hydrogen's key role in delivering climate neutrality means it merits a dedicated framework. It will become a crucial energy vector and the other leg of the energy transition alongside renewable electricity by replacing coal, oil and gas across different segments of the economy.

In a system soon dominated by variable renewables such as solar and wind, hydrogen can contribute as an enabler of sectoral integration. As a direct product from renewable energy production, hydrogen can enable the transition to renewable sources by providing a mechanism to flexibly transfer energy across sectors, time and place in a more circular energy system. In addition, clean hydrogen is a versatile energy carrier and strategic value chain that is key to the decarbonisation of heavy industries (e.g. steel, chemicals, refining etc.), heating and transport, in particular heavy duty trucks, lorries as well as maritime and aviation.

Furthermore, hydrogen can be seasonally stored and transported cost-effectively over long distances, to a large extent using the existing natural gas infrastructure. Besides, the potential to produce dedicated hydrogen from renewable and low carbon sources, the ability to store renewable energy as hydrogen during periods of peak production contributes to alleviating curtailment of renewable electricity, bringing flexibility to the power sector and efficiency to the functioning of the future energy system.

System efficiency is specifically important in an energy system dominated by variable renewables and decentralised energy production. As such, we raise concern on the consultation's suggestion that *certain gas production facilities (be it for bio-methane, hydrogen or synthetic methane) might not be connected to any network at all*. It is true that molecules can be consumed at the production site or transported by other means than pipelines, as the consultation points out. However, as hydrogen production scales up, pipelines and long-term storage are vital to balance the fluctuating nature of hydrogen produced from renewables and the need for stable demand.

At the same time, we highlight the need for a supportive policy framework to bridge the cost gap of clean technologies with more polluting alternatives and improve their business case. This translates among others into ensuring a grid connection for electrolysers until sufficient renewable capacity comes online to ensure sufficient running hours. This will be a requirement for a vast number of projects. In this context, the carbon content of the electricity mix and a sound guarantees of origin system will be key to qualify this part of the hydrogen production. Therefore, we call for a cautious approach to decentralised energy production facilities.

With a view to facilitating energy system integration, Hydrogen Europe underlines the need to broaden the scope of the revision to ensure harmonised hydrogen regulation across gas, electricity, fuels, emissions and

industrial frameworks. We consider it is key to go beyond the legislative documents mentioned in the consultation document (the Gas Directive and Regulation, the Network Codes in the area of gas) and to also review the Electricity Directive and Regulation, as well as the Electricity Network Codes when essential for sector coupling.

From niche technology to central pillar of EU energy & climate policy

Ramping up production of renewable and low carbon hydrogen is essential to reaching the EU climate objectives. It is time that hydrogen moved from an afterthought to a central pillar of the energy system. Failure to take action in providing a clear umbrella framework for hydrogen will delay deep decarbonisation and will lead to fragmentation, potentially overlapping and contradictory legislation and ultimately uncertainty for investors. It is imperative to remove barriers to hydrogen investment, create a level playing field with other clean technologies and promote a harmonised approach to infrastructure, demand and production related hydrogen issues via amending existing legal provisions and creating new ones where necessary. In this context, the revision of the Gas Directive and Regulation is very timely.

Hydrogen Europe agrees that current gas market legislation was designed for the organisation and functioning of the current natural gas sector. Now, it needs to be brought into line with the European Green Deal, the EU Climate Law as well as the European Commission's proposed Energy System Integration Strategy and the Hydrogen Strategy. EU legislation should recognise the role of alternative cleaner energy carriers and production methods while ensuring competition, diversity and security of supply.

Hydrogen Infrastructure

Today, the use of hydrogen is largely captive and private, with hydrogen infrastructure being unregulated. However, with a clean hydrogen market set to develop, a distinct legal framework at EU level for the regulation of hydrogen networks will become necessary. The regulation of hydrogen networks requires a gradual approach in line with market and infrastructure developments. At the same time, regulation needs to anticipate the emergence of natural monopolies and discriminatory behaviour. This exercise will need to go beyond mirroring gas legislation and simply integrating the role of hydrogen into existing gas laws. There are a number of reasons for that.

1. Gas and electricity markets were already mature when the discussions took place to foster competition and security of supply. The development of the hydrogen market will not be identical to natural gas market development. At the same time, a hydrogen market framework should respect the same principles of unbundling, third party access, transparency, non-discrimination, cost reflectivity for tariff setting, monitoring and oversight by NRA and ACER. Implementation of regulation should be progressive and take into account national specificities. In this respect, Hydrogen Europe welcomes the recent White Papers presented by ACER published in February 2021.

2. Hydrogen and natural gas are not interchangeable in all applications, for example, they could be in the heating sector, but not in a transport fuel cell or as feedstock. Energy intensive sectors including steel, petrochemicals and refineries *inter alia* are expected to be major sources of demand for hydrogen. They will need pure hydrogen to decarbonise; consequently, a hydrogen backbone infrastructure is required. Such

hydrogen infrastructure is not only necessary to physically transport hydrogen but also crucial for the development of a liquid market for hydrogen. Additionally, while we strive to develop stronger synergies between the TEN-E regulation and the TEN-T regulation to enable the decarbonisation of TEN-T corridors and heavy-duty transport, it is important to underline that hydrogen refuelling stations require pure hydrogen. Hydrogen Europe recalls that in 2030, if 50% of all heavy-duty transport conducted annually along the Scan-Med TEN-T corridor was powered by hydrogen, it would imply: approximately 40,000-50,000 H₂ heavy duty vehicles, 218 H₂ refueling stations, 328,000 million tonnes (MT) of renewable H₂ needed per year and 4.6 million MT of CO₂ emissions saved per year.

3. The revised TEN-E proposal creates a clear separation between hydrogen infrastructure and natural gas infrastructure. The blending of hydrogen and methane can be dealt with in the context of existing gas laws. However, pure hydrogen networks that will develop can be dealt with separately. The Commission should continue the logic it has conveyed in its TEN-E revised proposal to ensure consistency and coherence between legislation.

When considering the need for future legislation on hydrogen networks, the potential for a grandfathering clause should be taken into consideration with regards to existing hydrogen networks which are largely owned privately.

Infrastructure planning

From a grid planning perspective, the TEN-E proposal proposes that planning for hydrogen pipeline and network projects be integrated into the Ten-Year Network Development Planning (TYNDP) of the European gas and electricity network transmission system operators (ENTSO-G and ENTSO-E), under stricter supervision from the European Commission and the Agency for Cooperation of Energy Regulators (ACER). Investments in repurposing and retrofitting of natural gas infrastructure need to go hand in hand with a robust cost benefit analysis and ensuring that developments are in line with projected demand patterns. In this respect, and to complement the TYNDP process, the EU could mandate Member States to prepare hydrogen outlooks every two years which would include demand and production trends. These plans could be developed with a view to 2030, 2040 and 2050 and according to a new set of EU guidelines. The TYNDPs would integrate these national hydrogen outlooks in order to help identify minimum capacity requirements for cross-border gas infrastructure between member states and third countries.

In addition, Hydrogen Europe underlines that avoiding prohibitively high infrastructure costs for hydrogen shippers is crucial for the emergence of a competitive European hydrogen market. Therefore, a long-term financing mechanism is necessary for investors to facilitate the repurposing, retrofitting and construction of new hydrogen infrastructure. As such, we consider it important to assess the potential role of cross-subsidisation between gas and hydrogen infrastructure – taking into account the impact on consumers - alongside other funding mechanisms such as TEN-E, recovery plans. This option could be allowed at EU level or subject to the NRA's approval on a national level until the market reaches an adequate degree of liquidity.

Ensure a fit for purpose hydrogen market design

Definitions

Establishing a robust system of carbon reduction requires that the CO₂ content of energy carriers and vectors becomes the “new currency” of the energy system and EU economic recovery. Bringing trust and credibility to the energy system requires rapid agreement on a comprehensive and LCA-based uniform EU-wide terminology for renewable and low carbon hydrogen, including CCS and low carbon electricity.

This needs to be supported by the adoption of a methodology for the calculation of the life-cycle greenhouse gas (GHG) emissions from renewable and low carbon hydrogen as well as transparent and robust sustainability criteria in line with the principles of circular economy. This will enable comparability of energy sources in terms of their emissions factor and subsequent contribution to emissions reductions and meeting the objectives of the EU Climate Law. This methodology should be the basis for relevant EU funding programs and financial support for all energy carriers including hydrogen projects as well as for hydrogen trade with third countries.

Hydrogen Europe believes that thresholds for renewable hydrogen should be tackled within the context of the upcoming revision of the renewable energy directive. In line with our response to the aforementioned public consultation, we need to ensure that, in parallel, low carbon hydrogen has a clear framework and thresholds recognised in EU legislation. As such, the CertifHy threshold (60% GHG abatement/4,37 tCO₂eq/tH₂) should be taken as a starting point for the development of a low carbon hydrogen threshold. As technological developments advance, this threshold can be revised to take into account innovation in the industry e.g. autothermal reforming (ATR) and high temperature reactors (HTR) can reach up to 90-95% GHG abatement whereas existing retrofits can reach between 60-65%. These considerations should be taken into account within the context of the 2021 Gas Decarbonisation Package.

Removing double grid charging

In the case of electrolysers, double grid (power and gas) charging relating to the conversion/production of hydrogen is unjustified and should be removed. This imposes undue burden and unfair competition.

Create harmonised standards and guidelines for hydrogen quality, safety standards and procedures including hydrogen purity, pressures and flow speeds as well as measurement and control.

A new European technical standard could be issued, reporting the design criteria to be adopted to engineer new hydrogen pipelines and retrofitting existing pipeline to hydrogen transport. In this sense, it is important to set the right blending percentage and only inject in carefully selected locations in the high or mid pressure transport natural gas pipelines or inject into salt cavern hydrogen stores and meter it into the gas grid at the required rate when needed.

This is particularly important as several industrial applications can consume blends of hydrogen with gas. This should be considered in the short- to medium as a first step towards decarbonising industry. Such sectors include high-scale conventional electricity production which may act as a backup for renewables.