

Back to basics: are EU's energy regulatory principles compatible with its hydrogen strategy?

October 2020

ECA

The European Commission (EC) published its EU Hydrogen Strategy on 8 July 2020, setting out a vision of a significant role for hydrogen in achieving decarbonisation by 2050, recognising the difficulties of decarbonising some sectors purely through electrification and RES.

The scale of the proposed investments (up to 500 GW of electrolyzers by 2050 and almost €500 billion of investment) has attracted headlines, but less clear are the regulatory implications. How can a nascent and costly technology be promoted without sacrificing the principles of the EU energy market?

For three core regulatory fundamentals underlying EU energy markets - fair access, cross-border competition and avoiding cross subsidies - we examine potential conflicts with the ambitious objective of hydrogen introduction.

To blend or not to blend?

The EU Hydrogen Strategy implies in parts that dedicated hydrogen networks will be developed at initial stages for large industrial and commercial uses. However, for residential and more decentralised use the strategy implies that existing gas networks will be used. Two main options exist to implement this.

Option 1 is an overnight switch from gas to hydrogen for, say, an entire distribution network. This seems logistically and economically challenging: the high cost of hydrogen would need to be covered by those consumers only and all

required network and end-user appliance replacement investment would need to be made over a short period of time.

Option 2 is a gradual introduction of hydrogen into existing systems and therefore blending with natural gas. This seems a more feasible short term implementation option and could be similar to biomethane or other green gas support measures observed in Europe¹. While technical standards and regulations need to be developed to ensure the calorific value of the blend is not compromised, this approach also raises economic regulatory questions that go to the heart of the EU's energy regulatory principles.

Fair access

The EU Energy Packages were originally founded under the principles of market access and ensuring a 'level playing field'. Hence, non-discriminatory access to transmission and distribution networks was paramount.

Initially, hydrogen is likely to develop as a patchwork of fragmented production sites and/or networks utilising differing production technologies. This localised development and the technical limitations of blending gas with hydrogen will preclude physical hydrogen trading across the EU. This limits the scope for a liquid, competitive hydrogen market, which has been a guiding principle of the EU gas market.

With a significant cost gap between hydrogen and natural gas that is not expected to be closed over

¹ Sweden, Germany and the Netherlands for example support biogas through a mixture of investment

subsidies, priority access, feed-in tariffs and/or connection cost support.

the next decade, the uptake of hydrogen will need to be incentivised. Similarly to Renewable Energy Supply (RES) integration or biogas, preferred access to the gas grid may become a necessary policy option to meet ambitious hydrogen penetration targets. The resulting shutting out of natural gas is good news to meet the environmental targets, but distorts competition and access on the gas network.

Open, cross-border competition

Besides the physical limitations of open, fair and cross border competition to emerge as hydrogen is rolled out, subsidy measures to support hydrogen and close the production gap to natural gas in particular may further distort the principle of open and fair competition.

A working assumption in electricity and gas markets is that they are homogeneous goods once they enter the network. Generators and suppliers compete along the 'merit order' to meet demand at the point of entry and exit.

This dynamic has already been demonstrated in EU electricity markets. Heterogeneous national RE subsidies have created a fragmented electricity market and changed networks from 'passive' providers of access to enablers for new technologies.

Open competition of different hydrogen production technologies – even within national systems - is further complicated if subsidy schemes pick 'winners'. Hydrogen's place in the energy merit order may depend on the level of support (explicit or implicit) provided by the state, if purchase obligations arise, the technology type, and the carbon accounting of low-carbon hydrogen for its inclusion in the EU Emission Trading System.

The EU's strategy may have already signalled a 'winner', projecting up to €470 billion of investments in RES-based hydrogen versus only €3-18 billion for 'low-carbon fossil-based' hydrogen. This reflects an expectation that RES-based hydrogen's cost disadvantage will erode as electrolyser investments scale up.

So, if a hydrogen market is to develop, fair and open competition between different types of hydrogen production seems to be precluded from the EU's

expected investments in different hydrogen technologies, including various RES based technologies.

Avoiding cross-subsidies

As hydrogen is blended with gas in adapted gas networks, the question of who pays for the higher cost of hydrogen and associated additional network cost becomes pertinent.

Untangling the required network investments to make gas grids 'hydrogen ready' and apportioning those to consumers that use hydrogen seems infeasible. This may therefore inevitably lead to explicit cross-subsidies and a 'socialisation' of additional network costs. In European electricity networks this is common where additional network costs for RES integration are carried by all consumers.

In principle, cross-subsidies are not allowed within the EU energy market to ensure a 'level playing field'. However, some degree of cross-subsidisation can be tolerated within the EU gas NCs.² There is some precedent for exemptions in gas. For example, in the Netherlands, 11% of Gasunie's allowed revenue for 2020 is attributed to gas quality conversion (low-calorific gas from the Groningen field), and its cost allocation methodology works out to a cross-subsidy for low-cal gas consumers. However, ACER has accepted the justification that consumers also indirectly benefit from there being increased liquidity with a single gas quality trading market.³

The ambitious plan of the EC's hydrogen strategy provide a similar dilemma faced when RES was introduced in European power markets: how to meet environmental targets and maintain market based principles on energy market. For RES, these principles were initially softened – if not fully abandoned - by providing prioritised access, predetermined tariffs and initially limiting cross border trade. European natural gas markets and networks are likely to face a similar disruption with fundamental regulatory principles at risk of being circumnavigated in the much needed pursuit to decarbonise heating in Europe.

² See Article 5(6) of the TAR NC

³ ACER, Analysis of the Consultation Document on the Gas Transmission Structure for the Netherlands