FSR Regulatory Policy Workshop Series 2018-2019

Sector Coupling 2.0: Power to Gas in the EU Decarbonisation Strategy

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Sala Europa

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Introduction

The European Union has committed to decarbonising its economy, aiming to achieve a 80-95% reduction in greenhouse gas (GHG) emissions by 2050, with an intermediate target of a 40% reduction in 2030. Such goals are based on increased energy efficiency – with a 32.5% target in 2030 – and a greater penetration of renewable energy sources – with a 32% target by the same date.

While renewable gases and carbon-capture technologies can definitely play a role in the decarbonisation strategy, electrification will also be a key component, as it will allow the use of renewable-based, GHG emission-free energy in a wider spectrum of economic activities. However, the generation profile of some renewable-based technologies (e.g. wind and solar PV) is more intermittent in nature and less predictable than conventional generation. Moreover, the geographical distribution of primary renewable energies does not typically coincide with the consumption centres.

The opportunity of transforming electricity into gas might provide a way to deal with both these challenges, by using the existing gas infrastructure to store energy and to transport it over longer distances than is efficiently possible with electricity. Addressing the above-mentioned challenges will

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also significantly expand the potential of renewable energies.

At present, gas-to-power technologies are not economically viable, especially at network scale, but it is likely that their costs will reduce in the future. The widespread deployment of these technologies might enable a closer integration of the gas and electricity sectors through “sector coupling”.

In October 2018, the Florence School of Regulation organised a first Workshop on “Coupling the Sectors”, as part of this Regulatory Policy Workshop Series. On that occasion, the discussion not only covered the coupling of the electricity and gas sectors and markets, but it was also broadly agreed that power-to-gas could be a game changer in allowing sector coupling. However, the regulatory and market design implications of power-to-gas technologies at network scale becoming economically viable were not explored.

This Workshop will therefore focus on the implications of the deployment of power-to-gas technologies for sector coupling and the appropriate regulatory and market design responses.

Against this background, it is important to reflect on whether power-to-gas facilities should be considered as part of the gas or electricity networks (and therefore their ownership and operation reserved to transmission owners or transmission system operators), or instead they can be considered as performing an activity open to competition. In the former case, third party access should be guaranteed while in the latter case competition law would apply. In reality, it might well be that a combination of the two regimes might be the best approach to support the development of the new technologies, especially at an initial stage.

Another important aspect worth considering is to what extent the development of power-to-gas facilities might be promoted by the coordination of spot and forward markets in electricity and gas, so that such facilities (together with the gas networks and the gas-fired power stations) could be used for swaps (virtual electricity storage) and arbitrage (spark spread and “reversed” spark spread).

Power-to-gas technologies could also produce hydrogen and synthetic methane that can be used as energy for those processes which are not suitable for electrification or as chemical feedstock. If the electricity fed into the power-to-gas transformation is renewable-based, this process will contribute to the decarbonisation of the gas sector.

To address these and other related issues, the Workshop will be structured in two sessions:

- Session 1 will review the power-to-gas technological landscape, identifying the potentials for the different technologies and their future economic viability;

- Session 2 will discuss how power-to-gas could enable sector coupling, and deliver benefits in terms of greater temporal and geographical flexibility of the energy system, thus making the best use of a greater penetration of renewables to deliver the EU decarbonisation objectives. The regulatory and market design implications of such developments will also be explored.

Programme

08.30 – 08.45	*Welcome Coffee*
08.45 – 09.00	Welcome Address **Jean-Michel Glachant** | Florence School of Regulation
09.00 – 09.15	Introduction to the Workshop **Alberto Pototschnig** | Florence School of Regulation

Session I – Power-to-Gas: the Technological Landscape and Future Prospects

Chair: **Andris Piebalgs** | Florence School of Regulation

09.15 – 09.45	Power-to-Gas: a Technological Introduction **Luis Miguel Romeo** | University of Zaragoza **Martin Lambert** | Oxford Institute for Energy Studies
09.45 – 10.00	Business Case for Power-to-Gas **Catrinus Jepma** | University of Groningen
10.00 – 10.10	The 'Element One' Project **Tobias Frohmajer** | Tennet
10.10 – 10.20	The 'Hybridge' Project **Erik Riedel** | Amprion
10.20 – 10.30	The 'Store & Go' Project **Andrea Mazza** | Politecnico di Torino
10.30 – 10.45	General Discussion
10.45 – 11.10	*Coffee Break*

Session II – Power-to-Gas: Regulatory and Market Design Implications

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

11.10 – 11.50	The Views of the Electricity and Gas Industry **Cyril Harry** | Eurelectric **Nicolas Jensen** | Eurogas
11.50 – 12.30	The Views of the Electricity and Gas TSOs **Gerald Kaendler** | ENTSO-E **Jan Ingwersen** | ENTSOG

12.30 – 12.50	General Discussion
12.50 – 13.50	*Lunch*
13.50 – 14.50	The Views of the Stakeholders: Contributions from the FSR Donors **Jean-Marc Brimont** | GRT Gaz **Harald Stindl** | Gas Connect Austria **Juan José Alba Rios** | Endesa **Torben Brabo** | GIE **Andrea Galieti** | Engie **Modesto Gabrieli Francescato** | Terna **Ulrick Ronnacker** | Open Grid Europe **Johannes Stolle |** Ontras
14.50 – 15.30	The Policy and Regulatory Perspective **Colin Kuehnhanss** | European Commission **Dennis Hesseling** | ACER **Tom Maes** | CEER
15.30 – 15.50	General Discussion
15.50 – 16.00	Concluding Remarks **Alberto Pototschnig** | Florence School of Regulation