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Response of EEX to the EU Commission's consultation on Smart Sector Integration

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1. Introduction

European Energy Exchange (EEX) considers the use of cross-sector potential the decisive factor for the speed and success of the energy transition. An integrated energy system offers the possibility to release system and grid flexibility and to put infrastructure and resources to their best use, i.e. for the market and ultimately for the end consumer.

Integrating all forms of decarbonized energy supply and consumption is key to reach the 2030 and 2050 goals. Energy exchanges are the exemplification of sector integration: market participants from different sectors (utilities, municipalities, industrial consumers, etc.) already today trade energy commodities on the markets of energy exchanges - connected through efficient price signals. As EEX, we see our role in developing the necessary tools to connect markets and enable more efficient integration based off market-based instruments.

EEX is the leading energy exchange in Europe which develops, operates and connects secure, liquid and transparent markets for energy and related products. As part of EEX Group, a group of companies serving international commodity markets, EEX offers contracts on Power, Natural Gas and Emission Allowances as well as Freight and Agricultural Products. EEX also provides registry services for White Certificates, Capacity Certificates and Guarantees of Origin on behalf of the French State, as well as Auctions for Guarantees of Origin. EEX Group provides further services to GoO-registries via Grexel. EEX is the largest electricity exchange, the second largest CO₂ exchange and third largest gas exchange in the world.

2. EEX's responses

Question 1: What would be the main features of a truly integrated energy system to enable a climate neutral future? Where do you see benefits or synergies? Where do you see the biggest energy efficiency and cost-efficiency potential through system integration?

EEX has **rich experience in Sector Coupling**: Market participants from different sectors and backgrounds such as utilities, municipal utilities, industrial consumers, producers of electricity using renewable energy sources (RES), gas and oil companies trade energy commodities on our markets. Coupling gas and electricity markets through Gas-to-Power has been a reality on EEX Group's trading platforms for almost two decades.

Based on this, EEX sees the **main feature** of an integrated energy system in being resilient and flexible – particularly helping to make an electricity system predominantly based on RES manageable. An integrated energy system helps sectors to decarbonize that face difficulties in decarbonizing otherwise, e.g. heavy duty transportation, industrial processes and industrial feedstock.

Closely linked to that, EEX sees major **benefits, synergies and energy / cost efficiency potential** of an integrated energy system in an efficient use of energy, e.g. through using RES-based electricity in times of abundance and not having to curtail valuable energy. Within a market-based and digitalized integrated energy system, RES-producers may also find ways to improve marketing options for their electricity production, e.g. through connecting to electrolyzers. Through that, RES producers can increase their revenue stream and become less dependent on subsidies – to the benefit of end consumers and tax payers.

An integrated energy system also may help to make **efficient use of existing infrastructure** and avoiding over-investment in transport capacity: The gas grid can play an important role in absorbing abundant electricity supply through synthetically produced gas. Existing gas infrastructure that could easily become a stranded investment would be granted second life.

Question 2: What are the main barriers to energy system integration that would require to be addressed in your view?

In sum, we see the main barriers in **missing level playing fields** between technologies and distortions in wholesale but also on retail energy price levels, particularly for electricity. More specifically, we identified the three following main barriers.

- CO₂-Emissions are not evenly given a market-based price tag as only a **limited number of sectors is subject to the EU-ETS**. Additional steps of member states to price CO₂-emissions in sectors not covered by the ETS are not harmonized and not necessarily market-based – leading to an unlevel playing field between sectors.
- On level of the EU–member states **taxes, levies and tariffs tend to vary significantly** between energy carriers. On level of retail consumers this results in barriers to couple sectors such as heating, transportation and electricity and limits the potential of demand-side-response. On wholesale level this results in barriers to actually produce renewable gases through Power-to-Gas (PtG) based off market-prices.
- EEX sees a main barrier to sector integration in the **lacking market-price exposure of RES**. Though being integrated to the markets in most member states of the EU, RES are not fully exposed to market prices everywhere. Market premiums are very useful to bring RES to the market, however trading strategies optimize the RES´ market revenues and the market premiums. In Germany, for instance, RES are only exposed to negative prices when these occur in more than six subsequent hours. This may lead to a situation where not the full swings of the physical system are reflected by the market – ultimately translating in less attractive conditions for integrating sectors.

Question 3: More specifically:

How could electricity drive increased decarbonization in other sectors? In which other sectors do you see a key role for electricity use? What role should electrification play in the integrated energy system?

Renewable-based electrification is the **most cost-efficient and direct way to decarbonize energy** production and consumption. Wherever possible from technical and from an economic perspective, electrification should be the priority. Where this is not the case, renewable electricity can still be of use to produce decarbonized energy carriers such as green hydrogen – for certain industrial processes such as steel production or in heavy-duty transportation.

In an integrated energy system, **renewable electricity becomes the central energy source**. It becomes an input factor for the production of other energy carriers, e.g. gas, or to produce other forms of energy, e.g. heat and mobility. On energy markets we experience partly shifting roles. EEX has provided markets for sector coupling for almost two decades, with natural gas being the input factor to produce electricity (gas-to-power). In the future, electricity could play a completely different role becoming an input factor to produce gas and being the core energy source to drive demand-side-response.

What role should renewable gases play in the integrated energy system?

In an integrated energy system, renewable gases¹ take the position as **flexibility buffer**. Specifically, in the case of green hydrogen, electrolyzers can become an important flexibility provider, particularly in situations of abundant renewable energy and incentivized by low market prices. Then, renewable gas may also be used to generate electricity in times of little RES-supply – as reflected by high electricity prices.

Further, renewable gases in some industrial processes and some sub-sectors are the **only decarbonization option**.

EEX believes in an integrated energy system where **different sectors are connected through price signals and integrated markets**, actors being active on electricity, gas, emission markets plus certificates such as GoOs and potentially further decarbonized energy carriers.

Renewable gas will play a **key role** in this system. Within the current COVID 19-pandemic we were already able to take a look into the future: Given the sharp decline in gas and CO₂-emission prices, gas became more important as an energy source for power production, alongside power from RES. In Germany for instance, in the middle of lockdown in April 2020, gas almost doubled its share in power production compared to April 2019.

What measures should be taken to promote decarbonised gases?

What role should hydrogen play and how its development and deployment could be supported by the EU?

EEX believes in **market tool to promote decarbonized gases**. Market-based pricing of CO₂-Emissions within the EU-ETS is key to improve competitiveness of decarbonized gases. To promote particularly green hydrogen, full integration of RES to the electricity market with full market-price exposure would allow for price swings helping to make the production of green hydrogen economically viable.

Regulatory measures should focus on a **European perspective** as much as possible to allow for production of decarbonized and renewable gases where conditions are favorable. This includes non-discriminatory access to transport infrastructure: Where technically feasible, renewable and decarbonized gases should be granted access to the natural gas infrastructure. Where pure hydrogen transport infrastructure is necessary, we believe there is a need for regulation similar to gas network regulation allowing for third-party access. Also, GoOs are key within an integrated and European energy system. They need to be internationally tradable and mutually accepted. If designed correctly,

¹ We focus on biogas and green hydrogen being produced by electrolysis with renewable energy plus further gaseous products being derived from that. However, another option for decarbonization is potentially the use of blue and /or turquoise hydrogen.

they are a further link between sectors, making the “greenness” of energy transferable and tradable. They may also become an additional revenue source for decarbonized, renewable gases and green hydrogen.

Any additional support scheme, if implemented, should be market-based and allow for a market integration of renewable gases, one option being tradable quota and certificates.

How could circular economy and the use of waste heat and other waste resources play a greater role in the integrated energy system? What concrete actions would you suggest to achieve this?

How can energy markets contribute to a more integrated energy system?

Energy markets play a **pivotal role** within an integrated energy system, with price signals providing for incentives to connecting sectors and providing for the needed trading markets.

- Meaningful spot market **power prices** fully reflecting the physical reality of the system incentivize different uses of electric power in different sectors, different forms of low-carbon power production and flexibility provider. As such, they are a connecting link between markets. Power derivative markets allow market actors to hedge market price risk and counter party risk. Already today, RES are integral part of electricity markets, both on spot as well as on derivative markets. Though, in most European countries, RES are not fully exposed to market price risk as market premiums tend to be granted on a kWh-level. Subsidising RES on a kW-level prior to the actual construction instead, would incentivize RES to fully participate in the electricity markets. As a consequence, **electricity prices could easily drive system friendly dispatch** - reflecting exclusively the physical situation of the system instead of the subsidy level.
- Far-reaching market-based prices for CO₂ for different sectors within the **ETS** have the power to connect different sectors alongside the power price signals. With that, low-carbon and decarbonized energy carriers gain competitiveness over fossil energy carriers.
- **European GoO markets** for all energy carriers allow for transferring the “greenness” between energy carriers and as such are another link between sectors. If designed accordingly they may also provide a meaningful source of revenues for decarbonized and low-carbon energy carriers.
- **Liquid gas markets** integrate renewable gases easily and connect them to power, emission and GoO-markets and as such bring further flexibility into the system.
- **Markets for hydrogen** to be established in the future could either be an integral part of the gas markets or tradable on separate markets. Consumption and production of green hydrogen can be orchestrated through connected energy markets.

How can cost-efficient use and development of energy infrastructure and digitalization enable an integration of energy systems?

Digitalization is a **prerequisite for an integrated energy system** enabling market participants to get full knowledge about relevant factors (energy supply, energy demand) in real time.

Question 4: Are there any best practices or concrete projects for an integrated energy system you would like to highlight?

EEX is currently working on launching **Spark Spread products** to further strengthen the ties between gas and power sectors. With this product the price spread between power and gas prices will become explicit, generating greater transparency in price signals for gas-to-power conversion. Furthermore, trading will become easier as participants only need to join one venue to access power, gas and spark spreads. With spark spreads, traders will be able to hedge the risk of future margin changes between power and gas prices. In the future this may also serve renewable gases to connect to power markets and to hedge price risk, including **green hydrogen**. We follow the debate very closely and may consider launching markets for hydrogen plus renewable gas GoOs at a later stage.

Hydrogen GoOs are important tools to track green and blue hydrogen and potentially provide a price tag. Already today, renewable and low-carbon hydrogen GoOs are issued and canceled by **CertifHy** where Grexel, part of EEX Group, does the operation. The existing cases already showing the use of renewable electricity and biogas in the production of hydrogen as well as the use of hydrogen in the production of biogas, and all interplay backed with GoOs.

For further projects, we refer to the consultation response of **EPEX Spot**, part of EEX Group. EPEX Spot is running projects to particularly integrate demand side response and power markets.

Question 5: What policy actions and legislative measures could the Commission take to foster an integration of the energy?

To ensure a level playing field between energy carriers, **taxes, tariffs and levies should be regarded in a cross-sector approach** to avoid creating barriers to sector integration.

Today, emissions trading within the **ETS** provides a cross-sector price signal which should be **expanded with further sectors**. This ensures, non-ETS sectors also decarbonize efficiently and to provide market actors with an integrated price signal across industry, energy and transport sectors, and guide their economic activity and decarbonization efforts.

With a view on coupling power and gas we call for a **forward-looking and integrated approach to gas and electricity network planning**, taking into account sector coupling aspects. When it comes to the role of gas and its infrastructure, and in particular concerning the increasing use of renewable and decarbonized gases, there is a clear need for action at EU level. In addition to a clear political commitment, a modernization of the regulatory framework for the internal gas markets is urgently needed to enable the gas sector to play its part in achieving climate neutrality by 2050. The comprehensive use of renewable and decarbonized gases in all sectors (industry, transport, heat, power generation) and the use of the necessary and already existing infrastructures should be taken into account in all future measures. To help this development, there is a need for a uniform European terminology for renewable and decarbonised gases.

To allow for the transferability of “greenness” between sectors it is key to establish a simple and transparent EU-wide scheme for **GoOs for all energy carriers, particularly for renewable gas-GoOs allowing for tradability** of the certificates. Also subsidized energy carriers should issue GoOs where the revenues received serve to lower the amount of subsidies states have to pay. Already today this works: EEX runs the GoO-registry in France. On behalf of the French government, we also carry out auctions for GoOs of subsidized RES-plants, the revenues stream goes back to the French state budget.

Building up a **(green) hydrogen economy is a European job** and it requires markets connecting sectors and actors. Therefore, EEX calls for a European Hydrogen Strategy connecting green hydrogen production and consumption through market-based instruments and incentives. Market rules and distribution of roles should be clearly defined, respecting the principles of unbundling, guaranteeing a clear separation of networks from activities such as production, trading and supply. When establishing hydrogen transport capacity through a dedicated network, EEX call for an effective regulation allowing for non-discriminatory third-party access.

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