– Position paper –

Fit for 70% RES? – The role of the electricity market in a high-renewables energy system in 2030

Brussels, 14 July 2021 | To meet the raised ambition of the EU 2030 climate targets, including a 55% reduction in emissions, the European Commission estimates that the share of renewable energy in the electricity mix will need to double from today's share to approximately 55-60%[1], while in some more ambitious decarbonisation scenarios the share of renewable electricity may reach 70% in 2030[2]. We set out in this paper our vision for how the electricity market can adapt to help deliver a high renewable energy share, which will need to include a significant amount of intermittent (variable) renewable sources such as wind and solar.

Europex strongly believes in the merits of continued market development based on the current zonal wholesale market model. Trends such as uncertainty on wholesale prices and real-time balancing needs of the power system caused by several factors, not least the intermittency of most renewable sources which also have low to zero marginal variable cost, will become more pronounced in a high-renewable system. A clear and predictable framework for power sector investments is also necessary. We believe that a 2030 energy system that can meet these challenges must be characterised by undistorted and freely forming price signals from the energy market, efficient use of within-zone and cross-zonal transmission to balance supply and demand locally and regionally as well as increased use of storage and flexibility on the demand side. Indeed, these measures are necessary if rapid decarbonisation is to be achieved to deliver security of supply at an acceptable cost to the consumer[3], while integrating high shares of RES and meeting the needs of an increasingly decentralised energy system.

The reforms in the Clean Energy Package provide a good foundation for the further development of the electricity market up to 2030 and beyond. Commitment is needed to refine the existing tools at hand, including well-functioning short-term coupled physical markets, emissions markets, long term financial and physical hedging markets, as well as complimentary (bilateral) contracts such as PPAs, and Guarantees of Origin (GOs). We set out below what we believe will be the core building blocks of the electricity market in 2030, identifying also where further progress is needed.

[1] Communication COM(2020) 299 final), *Powering a climate-neutral economy: an EU strategy for energy system integration*

[2] Tsiropoulos, I., Nijs, W., Tarvydas, D. and Ruiz Castello, P., *Towards net-zero emissions in the EU energy system by 2050*, JRC Technical Report, 2020, JRC118592.

[3] An efficient market maximises welfare and helps to avoid costly long-term contracts subsidised by governments and ultimately taxpayers or electricity consumers.

1. Finer granularity products and further trading towards real time to help integrate renewables, reduce imbalance costs and reduce (TSO) needs and costs for resources (capacity and energy) to secure continuous real-time balancing of the power system

The spot markets are the physical markets to fundamentally balance EU-wide production and consumption (day-ahead) and correct forecast errors and unexpected disturbances until delivery (intraday). The day-ahead market incorporates all the available information at a certain moment in time and reflects the fundamental supply and demand balance across the EU plus Norway today that determines energy prices per bidding zone and implicitly the value of cross-zonal capacity that is utilised in the coupled day ahead market (i.e. SDAC). This will remain an important function in a high-renewables system. The intraday market is helpful for intermittent renewable production because trading is possible until close to delivery and generation ramps can be handled with finer granularity products, such as 15- and 30-minute products. The importance of the intraday market is likely to grow further, as trading close to delivery will be even more decisive in a high-renewables system. It is important to open such trading within each bidding zone and across all bidding zones as early as possible and to allow for such trading up to delivery. Algorithmic trading and further use of digitalisation and automation will allow assets to participate more efficiently in the market.

2. Cross-border integration and interconnection levels

Market coupling contributes to more efficient use of interconnectors. Connection between countries and regions also allows renewable supply and demand to be balanced out due to countries with different generation and consumption profiles. The role of interconnected and coupled markets will therefore increase in importance in a high-renewable system in 2030.[4] In addition to day-ahead (SDAC) and intraday (SIDC) markets, the integration of national balancing markets and the sharing of balancing resources across interconnectors (via the European balancing platforms) will facilitate the participation of renewables and demand response in organised markets before delivery (e.g. SDAC and SIDC) and in real-time balancing and ancillary services.

As a pre-requisite for well-functioning day-ahead and intraday markets, it is crucial that cross-zonal capacity for trading, e.g. in SDAC and SIDC, is maximised within the operational security boundaries. The ability to trade between different parts of Europe is necessary to resolve fluctuations in supply-demand conditions within single countries and regions by integrated trade between neighbouring countries and regions. Significant further investment in transmission and distribution grids is therefore fundamental to further integrate renewables, increase cross-border exchanges and support electrification objectives.

3. Open, market-based balancing & ancillary services to support the operation of the grid

Balancing services (energy or capacity) are reactive short-term means to maintain system frequency in the power grid. These are also a necessary part of a system characterised by high-RES shares and flexible demand. While more decentralised energy sources will pose new challenges for the grid, there will also be more available sources to support security of supply - enabling market participants to trade closer to real time on the intraday markets will support the

[4] See for example: Newbery D, Strbac G, Viehoff I. *The benefits of integrating European electricity markets*, Energy Policy 2016; 94: 253–63.

TSOs in maintaining system frequency via balancing and ancillary services. To the extent possible, balancing markets must be open to (aggregated) participation from variable renewable energy sources, demand response and energy storage, as required by the Clean Energy Package, via transparent, technology-neutral procurement. Non-frequency services should also be procured via open and competitive market-based instruments. More dynamic and shorter-term procurement will facilitate the utilisation of storage, distributed generation and load (aggregated or directly participating).

In a market with high levels of distributed energy resources, the imbalance settlement price provides an important price signal to incentivise system balance. Delegated operators, as they are now formally known in the Electricity Regulation, provide key services to TSOs in at least eleven Member States, including imbalance calculation and settlement. Innovation in this space will also support more efficient settlement and self-balancing closer to real time.[5]

4. The development of forward markets to hedge renewable-related risks

Energy derivatives markets play a crucial role in enabling market participants to hedge against risks stemming from a high-renewable system, such as price volatility and counterparty risk. Innovation in contracts to further support the physical market should continue – for example the development of more tailored contracts to support the hedging needs of market participants related to variable renewable energy such as wind, solar as well as batteries and demand response could be foreseen. Further utilisation of derivatives linked to different energy spot prices, e.g. derivatives based on intraday markets, will be beneficial in terms of meeting specific hedging needs.

Currently, the role of bilateral long-term agreements, or Power Purchase Agreements (PPA), in financing of renewable energy projects is emerging. This is also relevant for organised forward markets on power exchanges: market risks – such as price risk, volume risk or counterparty risk – are still inherent to PPAs and can be hedged via complementary trading on existing wholesale forward markets resulting in lower costs for financing. Liquidity is developing in contracts with increasingly longer trading horizons, providing the necessary tools to manage the risks of the energy transition.

5. Moving towards full integration of renewables in the market

Europex believes that a well-designed Energy Only Market (EOM) provides the basis for the market design in European countries. The principal part of the remuneration for renewable energy should be based on revenues coming from the remuneration of the energy commodity. With a phase out of subsidy schemes, electricity consumers or taxpayers will no longer need to pay for subsidies. Instead, the development of business models for market-based renewable remuneration schemes, such as new direct marketing models, should be encouraged. In a post-subsidy environment, it is important that RES has access to multiple revenue streams i.e. not only from wholesale markets, but also balancing and ancillary services, Guarantees of Origin (GOs), as well as via PPAs.

[5] For example, in GB, contract and meter notifications can be made up to an hour after gate closure to allow market participants to trade out their imbalance. This will be further facilitated by the roll out of smart metering and metering data closer to real-time.

The high-level principles of the EOM should be further exploited by removing price distorting impacts and ensuring the wholesale market price more directly impacts the retail prices, for those consumers who want it, and as such trigger more demand side response (DSR). For that purpose, it is essential to go forward with the abolishment of regulated end user prices that still exist in some EU MS. Furthermore, the EOM should be enhanced by looking for better ways to ensure that flexibility is properly valued and tradable. In principle, a well-designed European integrated, liquid wholesale market, e.g. day ahead (SDAC) followed by intraday (SIDC) and finally balancing mechanisms, rewards flexible generation and DSR.

In a high-RES system, conventional plants will still be needed, until other alternatives have been sufficiently explored and put into use, to provide reserves and flexibility when renewables are not available. One focus area has been on how such a plant should recover its costs running only during hours of system stress. In addition to the need to ensure free-price formation on the wholesale market to allow some cost-recovery during peak prices, well-designed capacity markets (valuing the reliability of the plant in kW), may be needed in a limited capacity as a last resort, and, if properly designed, have the advantage of minimising distortion to the wholesale price. The development of capacity remuneration mechanisms should be carried out in line with the Clean Energy Package requirements, with oversight by the European Commission.

6. Increasing demand-side flexibility and storage

An increase in demand-side flexibility will be fundamental in an energy system with a high share of variable renewable energy. This flexibility will contribute to the large-scale integration of renewables via increasingly significant loads, such as electric vehicles or power to gas, while consumers will also increasingly offer their flexibility, either individually or aggregated. The development of storage is also vital to enable the shifting of supply and demand over time, allowing the integration of larger shares of renewable energy. It is important that market-based approaches guide the procurement of flexibility, in line with the Clean Energy Package. New markets at distribution level will help unlock local flexibility resources which can help contribute to congestion management and match supply and demand of flexibility resources. Such markets should complement the existing wholesale markets (day-ahead, intraday and balancing) markets. Important first steps are the full implementation of the relevant Clean Energy Package provisions and establishing clear frameworks for (independent) aggregation. Finally, the right tariffs are needed to facilitate further demand-side response: the design should ensure that consumers receive signals on the time-varying cost of supplying electricity.

7. Price signals reflecting the value of electricity services to the system

With more variable RES supply, higher-resolution prices will become more valuable to allow more granular trading and responsiveness of both supply and demand. For example, prices can trigger demand-response measures or indicate the value of trading over interconnectors. Clear market price signals, to which market participants, including generation, DSR, storage etc. can respond, will help ensure efficient dispatch in the short-term and provide investment signals in the long-term. As recognised in recital 24 of the Electricity Regulation (EU) 2019/943 scarcity pricing also has a role to play and further analysis is needed to see how this could be implemented.

Regulated retail prices hinder the ability of those prosumers and decentralised energy resources to be exposed to price signals and should be phased out. Consumers should be able to choose their level of exposure to wholesale prices through different dynamic pricing products, supported

by clear and comprehensive information. At the same time, in a system with high flexibility needs, the energy component is what enables maximisation of the benefits of responding to market price signals. The share of taxes, grid fees and levies in final consumer bill reduces the energy component and must therefore be minimised. As a first step, a revised Energy Taxation Directive could more efficiently allocate the taxes and levies applied to different energy carriers (electricity, gas etc.), taking into account their climate impact.

8. A reliable carbon-price signal via the EU ETS

Besides competitive and liquid energy-only wholesale markets, a well-functioning greenhouse gas emissions market is needed. The ETS should be the EU's principal instrument to reduce carbon emissions. A carbon market price signal based on the free interplay between supply and demand is at the heart of efficient emissions reductions, including in the electricity sector. To strengthen the carbon price signal and the EU ETS, it is critically important to align the emissions cap with the increased target for 2030, while minimising market distortion. This will allow companies to incorporate the carbon price into their decision-making and investment behaviour. The cap also needs to be adjusted accordingly to take into account the effect of RES support schemes, to the extent that they reduce emissions and reduce carbon prices. Additional reforms needed to meet the raised 2030 climate ambition include increasing the linear reduction factor (LRF) in a predictable way, increasing the share of allowance that are auctioned and strengthening the Market Stability Reserve.

Conclusion

The 2030 decarbonisation targets pose a significant challenge for the energy sector, which needs to see accelerated deployment of renewables and the development of increasingly decentralised energy resources which need to be able to participate in the wholesale market. The current market design provides a good foundation to meet these challenges as long as there is a commitment to the necessary reforms in the Clean Energy Package, which puts the (active) consumer at the heart of the energy transition and focuses on efficient markets. Alternative proposals risk undermining the clear market approach taken by EU legislation or risk imposing a far higher cost to the consumer and taxpayer than necessary.

About

Europex is a not-for-profit association of European energy exchanges with 29 members. It represents the interests of exchange-based wholesale electricity, gas and environmental markets, focuses on developments of the European regulatory framework for wholesale energy trading and provides a discussion platform at European level.

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