ENTSO-E RECOMMENDATIONS TO HELP ACHIEVE EUROPE'S ENERGY AND CLIMATE POLICY OBJECTIVES

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The EU has set itself ambitious targets for both the near- and long-term with the 2020 climate and energy package[1)] as well as a commitment to reduce greenhouse gas emissions by 80–95 % by 2050[2)]. To bridge the gap between these two time horizons, the EU has set its sights on securing ambitious renewable energy and greenhouse gas targets for 2030.[3)] With the aim of real customer choice and competitive energy prices, Europe's leaders are, at the same time working hard towards another major energy policy target: completing the Internal Energy Market (IEM).

1 EUROPE'S ENERGY CHALLENGE

The objectives of moving to a low-carbon energy system and the completion of the IEM are enormous challenges in their own right. If this was not enough, the EU is confronted by a number of other pressing issues.

1) http://ec.europa.eu/clima/policies/package/index_en.htm

2) EC Communication: A Roadmap for moving to a competitive low carbon economy in 2050

3) EC Communication 'A policy framework for climate and energy in the period from 2020 to 2030'

The crisis in Ukraine has placed security of supply at the centre stage of the energy policy debate, while the economic malaise has focussed the attention of politicians on safeguarding the competiveness of European industry and protecting vulnerable consumers from rising energy prices. Reaching such ambitious objectives results in a paradigm shift for the electricity sector which requires concerted action by policymakers, regulators, stakeholders and those who operate, maintain and develop Europe's power systems: the transmission system operators (TSOs).

European Network of Transmission System Operators for Electricity

entsoe

Meeting the flexibility challenge

One of the biggest challenges in moving to a low-carbon electricity system is the integration of large shares of renewable energy sources (RES) into the system. Primary forms of renewables such as wind and solar power are often variable and less predictable in their output than conventional power plants. Since electricity cannot be stored in very large quantities, this variability in output has made matching supply and demand (and particularly real-time 'balancing') in the power system ever more challenging.

As we move towards an electricity system where a growing share of supply is less predictable and controllable, the need for system flexibility and resilience becomes ever greater. Flexibility can be provided through conventional generation (especially gas power plants), demand-side response (where consumers adjust their consumption depending on supply conditions), storage (primarily through pumped hydroelectric power) and through more interconnectors (to connect areas with surplus electricity to those with a deficit).

The intermittency and sharp rise in power generation from renewables has had a significant impact on electricity wholesale prices, putting in particular the most flexible types of conventional generation under economic pressure. This has led, in several EU Member States, to growing concerns that such flexible conventional generation assets will be taken offline and corresponding investments might stall in future. To encourage power plant owners to keep their facilities running and ensure that enough generation capacity will be available in the future to match electricity demand at all times, many governments are in the process of devising capacity remuneration mechanisms (CRMs). On the basis of adequacy assessments, CRMs aim to ensure consumption-generation adequacy and system flexibility.

Completing the Internal Energy Market (IEM)

Achieving a fully-functioning single energy market is an ambitious objective which will benefit consumers across Europe through improved supply choice and more competitive energy prices. It will require both the necessary hardware and software. The former entails the need to ensure sufficient transmission capacity across Member States to allow trading of electricity. The latter will be delivered in the form of common trading arrangements and harmonised rules for calculating and allocating transmission capacity to market participants.

Such rules are being developed, in line with a vision shared by all stakeholders: the so-called Target Model for electricity markets. This Target Model is being completed across all market timeframes (forward, day-ahead and intraday) through voluntary regional implementation projects and through legally binding network codes, drafted by ENTSO-E.

The flexibility challenge has added another layer of complexity to the achievement of the IEM. Not only will the Target Model need some adjustment to address the challenge of integrating intermittent renewables, but the CRMs that are being rolled out also need to fit seamlessly with the Target Model to avoid unsettling the IEM. Furthermore, CRMs may, if not properly designed, slow down the deployment of other forms of flexibility such as demand-side response (DSR).

With such multi-faceted and intertwined challenges, it will not be possible to address each of them in isolation. Achieving a secure, competitive and sustainable electricity system will require policymakers to take a coordinated approach, which will also involve close cooperation with Europe's TSOs.

2 THE ROLE OF TSOs IN MEETING THE CHALLENGES

Placed between generators and consumers, TSOs are responsible for the bulk transmission of electric power on the extra high voltage networks. Europe has been benefiting from a very high reliability of its power system (more than 99.99 %). A disturbance or blackout at this level would come at a very high cost to society. Thus, TSOs have the ultimate responsibility for 'keeping the lights on' at a system-wide level and at the lowest possible cost for consumers. As the security of electricity supply is a paramount prerogative, any policy that might have an impact on the electricity system needs to be designed and implemented with the close involvement of the TSOs.

In this regard, TSOs have a central role to play in facilitating Europe's energy transition, including the two central aspects of renewables integration and the completion of the internal energy market.

TSOs' system-wide perspective puts them in charge of system development – accommodating RES and market integration objectives – and makes them natural market facilitators ensuring access to the electricity network on a transparent and non-discriminatory basis to all market players.

ABOUT ENTSO-E

The European Network of Transmission System Operators for Electricity (ENTSO-E) represents 41 transmission system operators (TSOs) from 34 European countries.

ENTSO-E was established by the Third Legislative Package for the Internal Energy Market in 2009.

To help achieve Europe's energy and climate policy objectives, Regulation (EC) 714/2009 on conditions for access to the network for cross-border exchanges in electricity mandates ENTSO-E with a number of tasks, the most important of which include:

- drafting network codes which become binding EU regulations after having passed through Comitology;
- preparing non-binding ten-year network development plans (TYNDPs), which are the sole basis for the selection of projects of common interest (PCIs);
- preparing system adequacy reports;
- developing tools for the secure operation of the power systems;
- developing platforms to enhance transparency of the electricity market.

3 THE CHALLENGES FOR TSOs AND POLICY RECOMMENDATIONS

Challenges for TSOs range from making sure that investments in the development of the network are made on time, to ensuring that the design of the electricity market is fit for purpose and responds to the needs of an integrated, pan-European low-carbon energy system.

Network investments

Upgrading and expanding the transmission network as laid out in the TYNDP 2014[1)] is crucial for the integration of renewables as they are often generated far from consumption centres like cities, and the completion of the IEM so that physical trading constraints are removed. These investments will also benefit all European consumers through reinforcing the security of electricity supply. To this end, the plan identifies the need to invest up to € 150 billion in the construction of new or refurbished transmission infrastructure totalling around 50,000 km of extra high voltage power lines in Europe by 2030.

Despite this, investments into infrastructure projects are lagging behind due to: (a) a lack of public acceptance, especially for the construction of overhead power-lines; (b) difficulties for TSOs to attract capital in particular for cross-border projects, which are assumed riskier; and (c) slow and complex permit-granting processes, especially for cross-border projects. Today, more than one third of TYNDP investments are delayed – mostly due to social resistance and longer than initially expected permitting procedures.

POLICY RECOMMENDATIONS

- Political support is needed to build public acceptance for the construction of transmission lines. Building new transmission infrastructure on time will also require the swift implementation of the guidelines for trans-European energy infrastructure (Regulation (EU) 347/2013) at Member State level to ensure that the streamlined permit-granting procedures for PCIs take effect as soon as possible.
- The construction of transmission infrastructure required to meet the EU policy goals will also imply significant financial needs for TSOs. Specific attention should be given, also at the European level, to ensure that the TSOs receive the appropriate incentives to invest, and therefore maintain their "financeability".

Adoption and implementation of network codes

Network codes, organised into the areas of grid connection, markets and system operations, set out the harmonised legal framework required for the achievement of Europe's energy policy goals. The codes on grid connection aim to ensure the power system can cope with large amounts of renewable energy. The market codes set down rules to harmonise cross-border power trading, creating a level playing field for all market participants. Renewables and market integration have made system operation more complicated and challenging. This complexity is addressed by ENTSO-E's operations network codes. Unfortunately, the complexity and breadth of the network codes has resulted in several of them being stalled late in the legislative process and their adoption is thus delayed.

1) https://www.entsoe.eu/major-projects/ten-year-network-development-plan/tyndp-2014/Pages/default.aspx

POLICY RECOMMENDATIONS

- Network codes must be adopted without further delays. ENTSO-E and the Agency for the Cooperation of Energy Regulators (ACER) have strived to draft ambitious codes within demanding time-fames. The finalisation and adoption of these codes is therefore of paramount importance and will require resolve and adequate resources.
- The adoption of network codes should be followed by an ambitious implementation plan for which ENTSO-E should take a leading role through monitoring and advising on implementation.

Market design and the flexibility challenge

In order to maintain the high standards of security of supply and system reliability as we make the transition – at the lowest possible cost levels to consumers – to a low-carbon power system, the design of electricity markets needs adjustments. At present, the European electricity market does not value system features such as capacity and flexibility and therefore lacks the required mechanisms to unlock the resources required to integrate large shares of RES in a way that optimises cost-competitiveness. In the future, these features should be incentivised by the market as they add value not only to the power system, but eventually to consumers.

POLICY RECOMMENDATIONS[1)]

- The **Target Model should be implemented as soon as possible** to improve market efficiency and investment signals. However, this will not be enough to meet all the future challenges of our energy policy. To ensure security of supply, **price signals for investments and performance (esp. flexibility) need to be improved**. This will require the following key elements:
- **Renewable energy sources should be fully integrated into the market.**
- **The demand-side** should participate as much as possible in all markets to help overcome system scarcities.
- **Balancing prices** should be reflective of full system costs.

1) http://ec.europa.eu/clima/policies/package/index_en.htm

The implementation of these policy recommendations entails that

1. Producers of renewable energy should have the same duties and responsibilities as all other electricity generators. Giving producers of renewables incentives to correctly forecast their feed-in and hedge their volatility leads to higher grid stability.
2. The demand-side, i.e. consumers should be given the possibility to value their consumption and to choose over their consumption. The demand side should be enabled to participate in all markets not only for energy but also for reserves, ancillary services or capacity mechanisms (where introduced).
3. Balance responsible parties (BRPs) should be given sufficient incentives to be balanced during real time operation. Today this is not always the case because the financial incentives are not set adequately. With sufficient incentives, however, BRPs will perform more in line with system needs, thus contributing to system security at a reduced cost to end-consumers.

Finally, policymakers should **maximise coordination and cooperation on domestic energy policies** to mitigate the impact of individual Member State policies on the IEM. This is, among others, important with regard to the design of capacity remuneration mechanisms (CRMs).

This means that CRMs, where introduced, should be transparent, market-based and forward-looking. As a general principle, electricity markets should reveal the value of capacity and of flexibility based on consumers' choices. Furthermore it is important to think European and consider a full range of risk-hedging possibilities. Policymakers should therefore be aware of the risks of introducing market reforms which could lock-in investment choices not supportive of future innovation and customer empowerment.

Given the complexity and multitude of challenges, formulating and implementing solutions will require a high degree of coordination between policymakers and all stakeholders for years to come. Nevertheless, by acting upon the policy recommendations put forth in this paper, policymakers will set Europe on the path towards resolving these key challenges.

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