
ENTSO-E Response to EC Consultation on Market Design

8 October 2015

Consultative Market Design Communication

Introduction

Europe's electricity system is undergoing a profound change that concerns the power system as much as the power market, with a direct impact on transmission system operators' (TSOs) responsibility to ensure a reliable and well-functioning power system and facilitate the market. As the power system evolves, the market design requires regular updates to incentivise behaviours in line with the needs of the power system but also to ensure that investment and dispatch incentives work well.

In this context, TSOs play a pivotal role: Their networks and their market setups connect all users and service providers into one system. TSOs thus need to contribute to the design and implementation of market rules supporting system needs and energy policy. Being regulated and unbundled, TSOs act individually and jointly through ENTSO-E in the interest of society at large.

1) Would prices which reflect actual scarcity (in terms of time and location) be an important ingredient to the future market design? Would this also include the need for prices to reflect scarcity of available transmission capacity?

Answer

Yes, prices reflecting actual scarcities (in terms of time and location) are a key element to enabling the future market design to deliver/ensure power system adequacy, efficiency and resilience.

Market prices accurately reflecting the real situation of the electric system, including temporary scarcity situations (e.g., periods of low wind and high demand), are a prerequisite to mobilising effective end-consumers' participation in markets and to delivering efficient market outcomes and social welfare.

The wholesale and end-user prices should also reflect scarcity of available transmission capacity. Structural transmission capacity constraints can be adequately reflected through well-defined bidding zone configuration and price differences between zones when transmission capacity is fully utilised.

Further explanation

- Yes. The future market design will have to deliver a power system that is both adequate and efficient in generation and demand. The power system needs accurate market prices to reach this objective, i.e., prices that reflect the real situation of the electric system, including temporary scarcity situations (e.g., periods of low wind and high demand). In competitive electricity markets with an increasing number of participants, market price signals are necessary to coordinate individual decisions towards an optimum for society. To achieve this, end-consumers need to be enabled and incentivised to react to market prices.
- The market design should ensure that electricity prices that all customers are exposed to accurately reflect power system scarcities and cost-relevant factors such as adequacy, resilience and location. This will allow rewarding or charging market parties according to their contribution or burden on the system.
- Wholesale price spikes and increasing volatility, which may well be one result of prices reflecting scarcities, should be accepted as an efficient market outcome. The transition to a low carbon generation mix (with more variable RES and more technologies with low marginal costs) implies higher price volatility and more frequent and extreme price spikes. For this reason, price caps in

wholesale markets should be applied only in the rare situations when supply and demand do not match (when the supply and demand curves do not cross). In these cases, price caps should be set sufficiently high so as not to distort investment signals.

- The market needs public and political acceptance of scarcity prices. Provided there is effective regulatory oversight to avoid market manipulation, investment signals will improve. Competition between suppliers, dynamic prices and larger retail markets are prerequisites to allowing end consumers to participate in the market. Regulatory barriers for independent aggregators, where present, need to be removed to unlock full DSR potential while preserving the role of balance for responsible parties.
- Hedging instruments can protect market parties and end consumers from undesirable volatility. These instruments therefore are a necessary and important part of the earliest possible introduction of scarcity pricing and dynamic pricing for end consumers.

Further explanation of: Would this also include the need for prices to reflect scarcity of available transmission capacity?

- Wholesale and end-user retail prices should reflect scarcity of available transmission capacity. We believe that transmission capacity constraints can be adequately reflected through bidding zone configurations and price differences between bidding zones (when transmission capacity is fully utilised). Related to Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (hereafter CACM Guideline), ENTSO-E has already started a review of the current bidding zone configuration.
- The CACM Guideline's provisions on bidding zones aim to keep an appropriate balance between allocation of structural scarcity transmission capacity with bidding zones on the one hand and re-dispatch costs on the other hand, considering liquidity, market power, TSO costs and transition costs between different bidding zone configurations.
- Well-defined bidding zones are necessary to properly value scarcity of available transmission capacity, but need to be complemented with accurate capacity calculation and allocation methods. In particular, Flow Based Market Coupling is based on a refined representation of the transmission network between bidding zones. Due to its innovative and dynamic nature, it allows for optimising the capacity available for trading, which in turn translates into significant economic welfare gains.
- Current energy prices on the intraday market may not yet properly reflect scarcity of available transmission capacity because of the specificities of the continuous allocation process between bidding zones in this timeframe. A pricing mechanism for cross-border intraday capacities has yet to be developed by all TSOs as requested by the CACM Guideline.

2) Which challenges and opportunities could arise from prices which reflect actual scarcity? How can the challenges be addressed?

Answer

Opportunities

Prices reflecting actual scarcities in the energy market represent an opportunity for market parties as an investment incentive for flexible generation, storage or demand response, especially if prices rise to ‘sufficiently high levels’ frequently enough. In addition, volatile prices should trigger the development of the hedging dimension of the market.

Price volatility increases the value of grid connections between different bidding zones, especially between zones with the highest or most frequent price differences. This raises the investment potential for more grid connections between areas, thus reflecting the ‘true value’ of grid connections. A positive side effect of stronger interconnections is increased system reliability of the connected areas.

Challenges

In the case of exceptionally high prices, this may bear financial risks that are difficult for small players to manage in the market if adequate hedging products (financial products) do not develop or are not accessible. This underscores the need for hedging products. In addition, vulnerable consumers may need separate protection (outside electricity market design legislation).

Because of the potential difficulties for small market participants and the need for hedging products, proactive public communication about this aspect of market design is crucial, emphasising price spikes as natural and healthy market outcomes if they reflect temporary scarcities correctly.

Further Explanation

- Direct enhancements of current electricity markets will contribute to solving current and future challenges, albeit not sufficient by themselves to completely meet them all.
- Market participants should be incentivised to contribute to solving the system scarcities they are responsible for. Requirements related to energy supply can be efficiently translated into incentives or obligations placed on balancing responsible parties—such as imbalance prices or capacity obligations when necessary.
- Hedging products will be needed to ensure effective investment signals. Hedging products will act as insurance for market participants to manage their risk of not fulfilling the necessary capability (e.g., having contracted enough capacity/flexibility to ensure a continuous supply for themselves or for their customers).

Could these prices make capacity mechanisms redundant?

Answer

We believe that the full implementation of market design changes exposing all demand and RES to price fluctuations, cost-reflective balancing prices and market-based hedging products minimises the need for capacity mechanisms and might, in the long-run, make them redundant. Capacity mechanisms might, however, remain a possible element of the market design, depending on how successfully market signals and innovation deliver the necessary flexibility and system adequacy.

Further explanation

- A number of governments in Europe has deemed the investment signal from the energy market as insufficient in itself to ensure their national security of supply (SoS) targets and have thus complemented it (or are planning to) with a public intervention that can take the form of a capacity

mechanism (capacity market, capacity obligations, strategic reserve, etc.) or other solutions such as introducing exit barriers to closing power plants. Improving the investment signals from the energy market, for instance with more accurate and unconstrained price formation, is always beneficial because it will increase the markets' ability to deliver system adequacy. However, whether this ability will be sufficient to meet national political targets for security of supply is currently not certain, since that also depends on the targets themselves.

- In areas (or countries) experiencing limited capacity adequacy issues, frequent appearance and acceptance of wholesale scarcity prices (not only volatile prices) minimises the need for capacity mechanisms.
- Conversely, in areas (or countries) that experience significant capacity issues, scarcity prices may not suffice to make capacity markets redundant because this will depend on the level of national SoS targets and on the achievement of additional preconditions. While it is difficult to define upfront all necessary preconditions, they do include features like liquid, well-functioning and coupled day-ahead and intraday markets, cost-reflective balancing prices, integration of RES (especially balance responsibility) and DSR into the market, dynamic pricing for end-consumers, and sufficient cross-border interconnection capacity.
- Regional or pan-European discussions about the European compatibility of market mechanisms and cross-border participation in national markets are needed to avoid market and investment incentive distortions. (See also our answers to questions 20/21.)

3) Progress in aligning the fragmented balancing markets remains slow; should the EU try to accelerate the process, if need be through legal measures?

Answer

ENTSO-E does not believe that any additional legal measures are currently necessary to speed up the aligning of balancing markets. Progress towards regional cooperation and integration for balancing markets varies significantly across Europe because regions are facing different challenges. The front-runners must be able to progress further without being held back by additional legal measures. They should rather be able to become benchmarks and target models for other regions. In addition, the future balancing markets will have to be tailored upon the specific regional challenges so we will see a variety of regional solutions within the single framework as provided by the electricity balancing NC (EB NC).

Harmonisation of the fragmented European balancing markets is a key step towards reaching the target model. The EB NC provides the basic framework for this harmonisation across Europe based on its timely implementation. Any additional measures risk delaying rather than accelerating the process. The EB NC puts into place a stepwise approach for achieving integrated balancing energy markets, and early implementation initiatives are already underway to serve as a road map towards the full implementation of European integration models. Additional measures can only bring value if they are based on sufficient experience of pilot projects and upon verification of the technical feasibility of current models and pilot projects. Presently, however, these have not been proven on all aspects (e.g., automatic frequency restoration reserves). Support needs to be provided in the process of convergence of some regulatory rules (e.g., negative prices).

The balancing markets of the future will develop in such a way that by accommodating distributed flexibility, their efficiency and that of the overall power system increases. Customers, either directly or through aggregators, will have to be present in all markets, including the balancing markets.

Further details

- Progress towards regional cooperation and integration for balancing markets varies significantly across Europe since regions are facing different challenges, reflecting local generation, consumption and grid characteristics, and it is difficult to define 'one-size-fits-all' solutions. The regions that are front-runners must be able to progress further, being innovative and developing solutions that inspire other regions and possibly serve as future target models. We expect that the balancing markets will also have to be tailored to the specific challenges of each region and that solutions will vary across regions.
- ENTSO-E agrees that harmonisation of the fragmented European balancing markets is an essential step towards reaching the target model. The EB NC describes in detail the process to achieve integrated balancing energy markets through a stepwise approach. Early implementation initiatives have already been started by TSOs and ENTSO-E. These initiatives aim to develop the road map towards the implementation of European integration models. These are executed in collaboration with NRAs and ACER and with the consultation of European stakeholders.
- However, we emphasise that the alignment and creation of coordinated balancing energy markets needs to be conducted smoothly and carefully by taking into account the learning points from the early implementation projects. This is due to the complexity and importance because it is vital for security of supply. The complexity is:
 - balancing energy markets are comprised of several components and are close to complex real-time processes;
 - there are technical differences between the different types of reserves in different countries/regions. An important reason for this is differences in the physical power system, which influence the type of reserves that are technically available from different suppliers and the different challenges in the different regions; and
 - it is not possible to change technical specifications of one type of reserve in isolation since the different reserves are used in one common process. For example, changing response time for automatic frequency restoration reserve (aFRR) may require a different response time for frequency containment reserve (FCR). Otherwise, there may be unintended interference between the responses from the different reserves.
- Defining concrete deadlines for the fulfilment of the European integration models or shorter deadlines for the other steps does not seem realistic. So far, there is not sufficient experience to stipulate explicit deadlines (compared to other timeframes such as a day-ahead). In our opinion, the precondition of the definition of concrete timings is to have certainty about the technical feasibility of the European integration model, which has not yet been proven on all aspects, e.g., aFRR. On the other hand, ENTSO-E believes that support can be provided in the process of convergence of some regulatory rules, e.g., negative prices.
- In summary, additional legal measures would constitute a duplication of effort to the implementation of the NC EB, which would distract all actors from the required progress and experience building described in the NC EB. Additional measures would thus delay rather than accelerate the harmonisation of balancing markets across Europe. In the even worse case of legal measures imposing solutions without waiting for and building on the needed experience, balancing market malfunctions and their potentially severe consequences could throw us back years in building a well-functioning integrated European electricity market.

4) What can be done to provide for the smooth implementation of the agreed EU wide intraday platform?

Answer

The cross-border intraday project (XBID) can become the agreed EU wide intraday platform if the project is supported by all NRAs. They should ensure the smooth approval of methodologies requested by CACM as well as of the XBID costs associated with the European-wide implementation of the platform.

In addition, faster decision-making processes and proper measures to mitigate risks are key to enabling the smooth implementation of the project in the long run. These should focus on designing an adequate governance and decision-making structure for the project between PXs and TSOs, defining a clear timeline for EU integration, defining PX (partial) cost recovery structures, agreeing on border by border positions by NRAs on the mandatory elements of the go-live, and defining clear roles and responsibilities of TSOs and PXs as monitored by NRAs/ACER.

Transparency of the project, especially of CACM compliance and the necessary flexibility to meet local requirements in the European-wide implementation, is key to ensuring proper implementation. The introduction of an incentive scheme could be considered to accommodate the different regulatory/business models of TSOs and PXs and support the process.

Background and details

- To allow the cross-border intraday project (XBID) to become the agreed EU wide intraday platform, the XBID project should be supported by all NRAs. In particular, they should ensure the smooth approval of methodologies requested by CACM as well as of the XBID costs associated with the European-wide implementation.
- The two most critical elements that the project needs to focus on are incentivizing quick decision-making and good mitigation of risks. The following improvements would thus be beneficial for both the project and market parties.
 - Questioning the limits of the unanimity in the decision-making process and incentivize quicker decision processes. In fact, the governance structure of the intraday project is complex and based on unanimous agreements between PXs and between PXs and TSOs, which are not facilitating fast decision-making.
 - Clear guidance on the timeline for EU integration by the NRAs/ACER and the EC, especially how to balance between short-term implementation and long-term full harmonisation.
 - Already defining the PX (partial) cost recovery beyond the current agreed-upon budget to create a real incentive.
 - A border by border position by NRAs—also endorsed by ACER—on the mandatory elements for the go live (implicit and/or explicit allocations, pricing, losses, etc.).
 - A clear distinction of roles and responsibilities of TSOs and PXs is necessary; in this context, NRAs/ACER should continue supporting the project with a particular focus on:
 - resolving the inherent competition and equal treatment issues among PXs;
 - monitoring the PXs in relationship to cost-efficiency more directly and closely and not leaving the main responsibility for this to TSOs; and
 - the go-live planning of local implementation projects should be structured flexibly instead of waiting for a 'big bang' implementation.
 - Transparency of the project, especially of CACM compliance and the necessary flexibility to meet local requirements in the European-wide implementation to be communicated in line with the procedures of the CACM Guideline.
 - Lastly, the introduction of an incentive scheme could be considered (if not for this, then at least for other future European projects) while clearly taking into account the different regulatory/business models of TSOs and PXs.

5) Are long-term contracts between generators and consumers required to provide investment certainty for new generation capacity? What barriers, if any, prevent such long-term hedging products from emerging? Is there any role for the public sector in enabling markets for long term contracts?

Answer

Long-term contracts are not required to provide investment incentives in electricity markets because numerous other measures are suitable to preserve efficiency of the IEM while ensuring appropriate investments: full implementation of the target model, integration of RES and DSR, cost reflective balancing prices, acceptance of scarcity prices, and emergence of risk hedging products.

Background and details

- As noted, we believe hedging products are a crucial feature of future markets and investment incentives, but we need to distinguish between direct delivery contracts between generators and consumers on one hand and more general risk hedging products on the other hand.
- In the majority of cases, we do not think long-term contracts are required to provide investment incentives in electricity markets. A number of other measures is needed to preserve the efficiency of the IEM while ensuring appropriate investments: full implementation of the target model, integration of RES and DSR, cost reflective balancing prices, acceptance of scarcity prices and emergence of risk hedging products.
- In general, the advantage of direct long-term contracts between generators and consumers compared to hedging markets and instruments does not seem evident. Transaction costs, lack of sensitivity to volatility and limited knowledge about the electricity market are obstacles for consumers becoming directly active in such business transactions. Long-term contracts might be useful to encourage high capital cost generation technologies that contribute to low-carbon aims, but only if they do not penalise energy market liquidity, do not distort competition or hamper new entrants. Moreover, it must be noted that they could require significant collateral from the consumer side, which not everybody may be in a position to provide. Lastly, long-term physical contracts may be challenging for cross-border trade.
- Instead, ENTSO-E advocates the emergence of hedging products such as, for instance, intraday cap futures recently introduced on power exchanges. Provided all generators are subject to balance responsibility, imbalance prices are reflective of full system costs, and market parties are incentivised to balance their position in intraday markets rather than in balancing, hedging products should emerge spontaneously because the less flexible BRPs will demand risk hedging opportunities that should be offered by the more flexible BRPs. Such hedging products would have the ability to value flexibility and translate it into a more predictable and bankable revenue stream compared to the underlying commodity; this will further stimulate investments.
- For clarification, we do not think hedging products should necessarily have a very long-term product duration, at least in the meaning normally associated with long-term contracts between generators and consumers (e.g., 5-10 years). The market itself will determine the right balance between duration and liquidity of hedging products.

What barriers, if any, prevent such long-term hedging products from emerging?

- Forward markets already provide hedging opportunities for generators. In the past, investment uncertainty was mainly driven by uncoordinated and unstable regulatory frameworks, which resulted in inefficient and distorted short-term markets. Hence, the European Commission should work to improve the coordination of national energy policies with regard to stable investment

conditions. Moreover, there needs to be a clear consensus and communication on the circumstances that cannot be considered stable, such as bidding zone configuration or bilaterally available cross-border capacities (e.g., under flow-based capacity calculation). Changes in those are normal and healthy adjustments to the market conditions, as described in the CACM Guideline.

- It also needs to be acknowledged that the possibility for long-term contracts is limited by the capability of the electricity grid, the rules for non-discriminatory access to the network and competition law. For instance, transmission rights for scarce cross-border capacity between bidding zones cannot usually be reserved or allocated for longer time frames than one year, e.g., to not create market entry barriers for other parties. As described above, financial transmission rights could cover longer time periods with less risk of market distortion.
- Hedging products such as intraday cap futures are being experimented with by market parties in Europe, but are not yet widely developed. The main barriers preventing hedging products from emerging for the moment are:
 - lack of incentives to hedge:
 - energy prices are low and volatility is not increasing as fast as could have been expected;
 - market parties are not incentivized enough to hedge adequacy risks;
 - physical load curtailment risk is shared between all consumers (consumers of a 'short' supplier have the same curtailment risk as consumers of a 'long' supplier). Thus the risk is only financial; and
 - many consumers have a 'free hedge' through regulated prices that are often fixed for long periods. The introduction of smart meters will allow consumer prices to reflect scarcity, which in turn will introduce an incentive to hedge.
 - Counterparty default risk or cost of collaterals against this risk.
 - Asymmetry of risk between generators and suppliers/consumers. Most consumers are not interested in long-term hedging because they do not have enough visibility on their own business and energy consumption in the long run to be interested. Thus, suppliers would be at risk if they secure a purchase price without having secured their sales to end consumers.
 - Assessment of risks is difficult: Risks on security of supply have low probabilities but high impacts, which makes them difficult for the market to manage.

Is there any role for the public sector in enabling markets for long-term contracts?

- If the necessary preconditions are in place, hedging products will emerge in the market (offered by PXs). However, if this is not the case, governments or regulators could facilitate this, for instance, by introducing capacity obligations. To address the technical scarcities with predefined hedging tools, obligations could be placed on market participants, while products explicitly associated with a specific scarcity/capability could be centrally developed.

6) To what extent do you think that the divergence of taxes and charges levied on electricity in different Member States creates distortions in terms of directing investments efficiently or hamper the free flow of energy?

Answer

A high level of taxes and charges as currently observed distorts the retail market in that the energy element in the electricity price becomes secondary and incentives are reduced to react dynamically to price signals.

The costs associated with renewable energy support schemes are charged in various ways in different Member States that negatively impact the functioning of the market and the effectiveness of the market price signals. In addition, the heterogeneity of recovery mechanisms in Europe implies that costs associated with the supply of renewable energy are effectively allocated to different end users.

The differences between Member States not only in the level and but also in the allocation of RES supports charged to different customers lead to a strong distortion of market functioning and investment signals. When these flat charges represent a significant component of the final electricity bill, they blunt incentives for customers to react to scarcity and surplus price signals from wholesale, ancillary services and congestion management market signals.

Further details

- We believe that incentives work. Taxes and charges affect costs and revenues of generators and consumers, and thus not only their incentive to generate and consume electricity, but also their incentive to invest. Differences in taxes and charges across Member States will affect operations and investment decisions for generators, consumers and grid owners. If taxes and charges were equal across the EU, investments in the power system would probably have been very different from what we have experienced so far.
- It is worth noting that other market, policy and regulatory differences similarly create different incentives between Member States, such as differences in efficiency of approval processes, the likelihood of public acceptance for relevant investments, the maturity of local power markets, the predictability of regulatory development, the degree of transparency and the risk of policy shifts.
- In general, a high level of taxes and charges limits the non-regulated part of the electricity price and relatively reduces the incentives to react dynamically to the price signals.
- Differences in taxes may cause international companies to invest due to taxes instead of raw electricity prices. Taxes on generation—including corporation tax—can have a greater impact on investment decisions. For instance, if they are more indexed on the energy generated, they can bias generation decisions.
- Taxes on consumption may have a limited distortive effect on markets, but they can impact electricity demand and affect customers' fuel choice decisions in the long term.
- Looking at taxes and levies directly related to renewable energy, it must be noted that the costs associated with renewable energy support schemes are charged in various ways in different Member States. The following typically holds:
 1. the absolute amount differs due to different national targets; and
 2. the allocation to various end users differs due to different allocation mechanisms.
- This impacts the functioning of the market because the market price in 'energy only' markets often does not internalise the capital (fixed) costs of the renewable infrastructure, which is subsidised. Hence, the effectiveness of the market price signal is affected. Furthermore, the heterogeneity of recovery mechanisms in Europe implies that costs associated with the supply of renewable energy are effectively allocated to different end users, consequently impacting and hampering the functioning of European electricity markets.

- This point has been also highlighted in the CEPA report conducted for ACER as part of the work on tariff structure harmonisation. CEPA concluded that 'Fragmented national taxation or generation support mechanisms (e.g., renewable generation subsidies or capacity remuneration schemes) for example, differ significantly between countries, and these factors arguably have a far more material influence on the investment choices of electricity generators in European electricity markets today'. Using European case studies, CEPA showed evidence of distortion of the investment and operational decisions of market participants, particularly of power generators.
- Lastly, divergence of renewable taxation across Member States has as a consequence an imbalanced development of RES across MS, leading to new flow paths of electricity often beyond national borders. This necessitates network investments and a change of network operation in neighbouring MS.
- In summary, the differences between Member States in the level and allocation of RES supports charged to different customers lead to a strong distortion on market functioning and investment signals. The EC's State Aid Guidelines help in this respect but do not eliminate the problem. This distortion is strongest when the amount of RES support charges in the customers' bills is highest, and in some countries, they have already reached a similar level as the electricity wholesale price component in the customers' bills. When these flat charges represent a significant component of the final electricity bill, they blunt incentives for customers to react to scarcity and surplus price signals from wholesale ancillary services and congestion management market signals.

7) What needs to be done to allow investment in renewables to be increasingly driven by market signals?

Answer

Investments in mature renewables should ideally be driven by the ETS. But for this to function as an effective investment driver, there would be a need for a significantly higher CO₂ price than today. Subsidies would be limited to immature (RES) technologies, added on the market price (like premiums) and not replacing them (like Feed in Tariffs). R&D support should play a major role in bringing immature technologies on the edge of markets.

As a priority, RES support schemes that do not expose RES to price signals should be removed (without retroactive change to existing commitments), and balancing responsibility should be imposed on RES as it is on all other technologies.

In any case, support to renewable power should be dynamic and related to market prices, so that, for example, no RES subsidies would be granted when wholesale prices are negative. Providing incentives for RES producers to correctly forecast their feed-in and hedge their volatility improves system security and economic efficiency through appropriate imbalance settlement prices. Lastly, participation of RES sources to ancillary services markets should be enabled, as long as they bear balancing responsibility.

Further explanation

- To keep up the necessary pace in the transition to a decarbonized energy system, expansion of renewable energy must be significantly more profitable than fossil energy. This may be achieved by a combination of support for RES and increased costs of fossil energy. The main factor driving the transition is in fact the *relative* price of renewables versus fossil energy.
- While immature technologies may require support for many years, including R&D support, to promote deployment and bring down costs, investments in mature technologies should ideally be driven by the market. However, for this to function as intended, the carbon price (ETS) must be much higher than today and ideally high enough to reflect the true value of reduced emissions. A

higher price on emissions and investors' confidence in future evolutions is essential to stimulate investments based on market prices.

- The price structure in the market gives important signals regarding the societal value of power generation at different times. Hence, subsidies should be in addition to the market price and should not replace it. This will incentivize RES that can deliver power with a high societal value. When the market price is below zero, there should be no subsidy to generation.
- When the carbon price is too low, price volatility in the power market will also be too low. In particular, the prices will not be high enough to reflect the societal marginal cost of power generation during peak hours when inefficient fossil fuel plants are called into operation. In the absence of sufficiently high carbon prices but with continuing RES support schemes, it must be achieved as quickly as possible to remove any RES support schemes that do not expose RES to price signals and to impose balancing responsibility on them, as it is on other generators. Furthermore, the support for renewable power (e.g., market premiums) could have a more dynamic nature, for instance, by being a function of the market price. While further analysis is necessary to concretely design such type of schemes, this would promote the development of RES-technologies that can deliver in periods with high prices and potential scarcity, thereby making it easier to phase out fossil energy without jeopardizing security of supply. Other market-compatible options are investment support (MW based) or competitive mechanisms such as auctions to determine the level of support.
- Below, we provide several additional detailed suggestions about near-term adjustments to RES development instruments,
 - Preferential treatment to RES should only be allowed if it does not increase dispatching costs.
 - With regard to support schemes, all RES (and conventional) mature technologies should be equally exposed to wholesale market price signals. This implies, as a minimum, respecting provisions set out in the recent Guidelines on Environmental and Energy State Aid, which require the introduction of balance responsibility and the phase-out of feed-in tariffs to be replaced by market premiums or less distortive support schemes.
 - Furthermore, to improve market efficiency, no RES subsidies should be granted when wholesale prices are negative. Providing incentives for RES producers to correctly forecast their feed-in and hedge their volatility improves system security and economic efficiency through appropriate imbalance settlement prices.
 - More accurate price signals, process and products are also needed to facilitate RES integration, compatibly with TSOs' operational processes and implementation challenges. For instance, the intraday gate closure time should be set in such a way that it maximises market participants' opportunities for adjusting their schedules (by trading in the intraday market as closely as possible to real time) while respecting the time required for guaranteeing system security. A more liquid intraday market would be more suitable for increasing shares of variable renewables because it will allow them to correct their imbalances with a higher predictability of their output.
 - Participation of RES to the provision of balancing and ancillary services should be enabled, compatibly with system needs, product specifications, and the RES balance responsibility.
- In the longer run, support for mature renewable technologies should be progressively reduced, especially if, as described above, the CO₂ price becomes a key investment driver. Supports (market premiums or investment aid) established in a competitive framework (e.g., auctions) would still be needed if markets are not sufficient to deliver politically agreed-upon targets on RES.

8) Which obstacles, if any, would you see to fully integrating renewable energy generators into the market, including into the balancing and intraday markets, as well as regarding dispatch based on the merit order?

Answer

Some obstacles to fully integrating renewable energy generators into the market currently are due to regulatory provisions and inadequate market rules. With regard to balancing, existing technical obstacles can be overcome, but the costs and benefits should be assessed when setting new requirements/obligations.

To ensure that balancing is done on a merit order basis, any subsidy proportional to the energy actually produced by RES should not be affected by delivered balancing energy. Subsidies proportional to energy produced should be avoided to stimulate better competition in the balancing market due to self-balancing of market participants.

With regard to dispatch based on the merit order, there are no real obstacles to integrating variable RES. Support premiums should not be awarded when the market price is negative and/or when there is excess production that cannot be integrated in the electricity system.

In intraday markets, there are no real obstacles to integrating RES, but there are challenges to designing a mechanism to avoid the functioning of RES units outside the merit order, given the prices in a continuous intraday market. In addition, the integration of RES generation units in control centres with correct real time data is essential to guarantee observability and controllability of the units and therefore to allow their participation in the wholesale, intraday and balancing markets.

Background and details

- Apart from political will and implementation lead time, a number of obstacles can be listed.
- Dispatch based on the merit order:
 - no real obstacle to integrate variable RES; it is simply a matter of not applying any support premium when the market price is negative and/or there is excess production that cannot be integrated in the electricity system (and, in case this concerns a significant number of hours each year, compensating the subsidy on a fixed-sum basis).
- Balancing
 - Obstacles to the participation of RES in balancing are essentially of a regulatory nature and based on inadequate market rules. Technical obstacles could be overcome. However, costs and benefits should be assessed when setting new requirements/obligations. For this reason, a power threshold should be established so all units (or groups of units connected to the same grid point) with installed power above this power threshold would be obliged to provide real time data to the TSO and to be integrated in a control centre for receiving instructions from the TSO for solving local constraints and for global system balancing.
 - To ensure that balancing is done on a merit order basis, any subsidy proportional to the energy actually produced by RES should not be affected by delivered balancing energy. In fact, the amount of energy produced should be adjusted for delivered balancing energy so the total subsidy is not reduced by RES delivering system support. Preferably, subsidies proportional to energy produced should be avoided to stimulate better competition in the balancing market due to self-balancing of market participants.
- Intraday markets: no real obstacle to integrated RES. Actually, participation in intraday markets is an opportunity for RES producers/aggregators that need to rebalance their positions given updated forecasts. However, it seems more difficult to design a mechanism to avoid the functioning of RES units outside of the merit order given the prices in a continuous intraday market; one price should serve as a reference, and the spot price seems to be a better candidate.

- As mentioned, integration of RES generation units in control centres with correct real time data is essential to guaranteeing observability and controllability of the units and therefore to allow their participation in the wholesale, intraday and balancing markets.
- Higher integration of RES, both in the market and in the electric system, will be an outcome of the reduction of the use of balancing energies by these units and of the increase of the balancing and ancillary services provided by these same RES units.

9) Should there be a more coordinated approach across Member States for renewables support schemes? What are the main barriers to regional support schemes and how could these barriers be removed (e.g. through legislation)?

Answer

A more coordinated approach across MS for RES support schemes is desirable because it would benefit locational efficiency of RES investments, but it should be encouraged through proper incentives rather than imposed by legislation. The type and level of support should be harmonised in Member States (MS) – at least at the regional level—to make best use of the natural resource at the European level by avoiding distortions due to support being more generous in some MS than in others.

If support schemes are to be harmonised, they should aim to achieve (i) coherence between the development of the grid (interconnections in particular) and RES units and (ii) balanced geographic distribution of RES to allow using the benefits of statistical complementarities between regions (particularly true for wind). A proper level of exposure to the wholesale market price is the obvious way to solve both these issues.

The least distortive and best harmonised way for effective RES support lies in higher CO₂ prices and the removal of all subsidies to mature RES technologies. In the absence of high CO₂ prices, the feed-in premiums could be made more dynamic to cost-efficiently stimulate their contribution to a secure and flexible power system.

Further explanation

- A more coordinated approach is desirable because it would benefit locational efficiency of RES investments. However, we believe this should be encouraged and incentivised rather than imposed by legislation.
- Political decisions regarding energy mix and renewables support schemes at national level have considerable cross-border impacts. These have to be considered in line with the target of a pan-European energy market.
- Given the fact that the 2030 RES targets are not country-specific but instead are set for the whole EU, it would be economically logical to ensure that the type and level of support is harmonised in Member States (MS) – at least at regional level—to make best use of the natural resource at the European level by avoiding distortions due to support being more generous in some MS than in others.
- This idea has, however, significant issues of political acceptability because this objective of economic efficiency would imply harmonising taxes paid by companies developing and managing RES projects. Moreover, it would imply significant transfers of money between MS since consumers and/or taxpayers from poorly endowed countries pay for RES production occurring in countries where the resource is more abundant, creating jobs and possibly providing cheaper electricity in these countries.
- Another key objective of the support schemes, if they are to be harmonised, is to achieve (i) coherence between the development of the grid (interconnections in particular) and RES units and

(ii) balanced geographic distribution of RES that could take advantage of the benefits of statistical complementarities between regions (particularly true for wind). A proper level of exposure to the wholesale market price is the obvious way to solve both these issues. More precisely, (i) producing at the same time as all the other units should reduce the producers' revenue in the same extent it reduces the collective value of their production and (ii) the amount of money on top of the market price should be harmonised—or possibly made proportional to the market price, as suggested above—instead of the target total value (implicit feed-in tariff).

- Other potential barriers:
 - different support schemes in place that cannot be retroactively withdrawn;
 - different levels of RES development among Member States;
 - different economic situations of Member States (and other circumstances);
 - lack of public acceptance for new generation (notably wind farms) in their vicinity (NIMBY) that contribute to the RES-target of a foreign country; and
 - lack of sufficient grid capabilities to incorporate and transmit increasing RES feed-in.
- In summary, the least distortive and best harmonised way for effective RES support lies in higher CO₂ prices and removal of all subsidies to mature RES technologies. If the CO₂ price is investible, the resulting market prices would still be low or zero at times and in bidding zones with strong insolation or wind, but the diversity of weather across Europe would allow not only biofuel and hydro but also solar and wind units to earn their investment costs at times when solar and wind energy do not cover the entire European demand. Cheaper storage would make even higher optimal solar and wind market-based investments possible and would correspondingly reduce the optimal market-based investments in conventional generation.
- If for European or global political reasons this proves elusive, investment supports or RES investment auctions are second-best approaches, as is designing feed-in premiums to distort as little as possible dispatch and investment signals, e.g., by making them dynamic by relating them to the wholesale market price.

10) Where do you see the main obstacles that should be tackled to kick-start demand-response (e.g. insufficient flexible prices, (regulatory) barriers for aggregators/customers, lack of access to smart home technologies, no obligation to offer the possibility for end customers to participate in the balancing market through a demand response scheme, etc.)?

Answer

Main obstacles to kick-starting demand response are related to:

- infrastructure (meters, data handling systems, etc.) challenges related to lack of efficient price transformation from the wholesale market to the retail market;
- market design challenges related to lack of exposure of consumers to the real cost of power in real time, to enable aggregators' participation and to ensure customers are free to access all relevant markets;
- regulatory barriers preventing new entrants such as independent aggregators and other third-party providers;
- challenges related to lack of transparency and competition between retailers and other service providers cross-border and cross-regionally;
- lack of harmonised regulation and support across borders; and
- lack of access to price information for customers.

These challenges can be overcome with concrete market design solutions (including roles and responsibilities), which already exist and are being implemented or experimented with in Europe.

Further explanation

Demand response implies that consumers respond to price signals provided in the wholesale markets (day-ahead, intraday and balancing) and to distribution or transmission congestion price signals. Hourly or shorter end-user settlement will be needed. Consumers may choose to limit consumption, increase consumption or shift consumption over time. We see three challenges for this flexibility to be realised.

- **Infrastructure development:** For activation of DSR in the retail market, there is a need for an efficient price transformation from the wholesale market. This requires incentives in the retailers' and third parties' agreements with the end user. Effective usage of smart meters and tools for adjusting consumption is fundamental. Central data handling systems are vital to ensure correct settlement data and transparency of balancing responsible party and retailer/aggregator information for a given load. Adequate market price data should be available for the actors to encourage participation. For load portfolios, it is necessary to have control mechanisms, including communication, in place to ensure that DSR is delivered.
- **Market design:** Consumers must be exposed to the real cost of the power they consume at all times (including the cost of imbalances). Contracts (potentially standardised) between supplier and/or aggregator and the end user unlocking the DSR potential should be developed. Aggregators have a role to play in developing DSR, but the market design must be carefully considered, and TSOs must be involved. Moving from national towards regional markets to ensure increased liquidity and competition could maximise DSR participation. In general, customers should be able to access all relevant markets. From a TSO perspective, the choice of the market design results from a trade-off between the imperatives not to increase residual system imbalance and to facilitate the development of additional resources
- **Regulation:** Regulation is needed to ensure transparency and competition between energy suppliers themselves on the one hand and with independent aggregators on the other hand, across borders and regions. This will allow consumers to have the negotiation power needed to optimise the economic value of their flexibility. It is vital that NRAs promote and incentivise DSR participation in the markets through harmonised regulation and support i.e., by regional market development, mandating information transparency between market players and enabling the role of independent aggregators or other third-party service providers by removing barriers to entry. At the same time, any evolution must preserve the efficiency and well-functioning of markets and their design components, such as the pivotal role of balance responsible parties, their information needs and balancing incentives. In addition, to reduce uncertainties and support the pan-European harmonisation of DSR participation in the market and to the system operation, it is crucial to develop, define and set appropriate parameters and criteria of technical requirements to be met by DSR resources when providing system services.
- **Customer empowerment:** Access to price information, consumption awareness and DSR activation require heavy consumer involvement, which can be facilitated with automation or by delegating the DSR process from the consumer to a company (e.g., supplier, independent aggregator or other third-party service providers). Consumers will react to dynamic price signals either directly or through aggregators.

These challenges can be overcome with concrete market design solutions (including roles and responsibilities), which already exist and are being implemented or experimented with in Europe. Most options are not mutually exclusive and can be considered complementary approaches for gradual implementation to unlock more DSR potential. DSR will also play a major role in reserves capacity markets, provided it meets reliability requirements.

11) While electricity markets are coupled within the EU and linked to its neighbours, system operation is still carried out by national TSOs. Regional Security Coordination Initiatives (“RSCIs”) such as CORESO or TSC have a purely advisory role today. Should the RSCIs be gradually strengthened also including decision making responsibilities when necessary?

Answer

The internal energy market integration has advanced through the regional integration of markets, infrastructure planning, and operations across many regional pilots among TSOs in particular.

Regional Security Coordination Initiatives (RSCIs) have been developed proactively by TSOs to provide coordination services, particularly in cross-border network security analysis. They play an increasingly important support role for operators in the control centres and ensure an optimal utilisation of the infrastructure.

The new System Operations Guideline will formalise important aspects of the ENTSO-E plan and project to extend the scope and responsibilities of RSCIs. This project is one of ENTSO-E’s most important current activities, and it focuses on strictly managed pan-European implementation of RSCIs, an end 2015 deadline for all TSOs signing a multi-lateral agreement and clarity about which TSO will receive which services from which RSCI.

Presently, RSCIs already cover 75% of the European population. ENTSO-E does not believe that changes to the role and responsibilities of RSCIs, including decision-making, should be made outside the framework of the ambitious ENTSO-E project and the System Operations Guideline.

Each RSCI will perform analyses in five areas of coordination (common grid model, capacity calculation, security analysis, outage planning and adequacy), providing TSOs with advice in these areas. These analyses are used by TSOs directly in their system management. The full decision-making responsibility in system operation, however, remains with the TSOs and is exercised according to national regulations.

Is the current national responsibility for system security an obstacle to cross-border cooperation?

The national responsibility in system security is not an obstacle to cross-border cooperation. ENTSO-E believes that the highest overall benefits for European consumers would be achieved through a full implementation of the current RSCI plan. Once the five areas of coordination are fully implemented everywhere in Europe, a careful cost-benefit analysis should be performed to identify other services that would benefit from being conducted at the regional level, rather than by TSOs individually.

Would a regional responsibility for system security be better suited to the realities of the integrated market?

We do not believe that shifting responsibility for system security to the regional level would be beneficial. In particular, the establishment of regional control centres with decision-making responsibilities would incur more costs and risks than benefits for consumers. It would increase complexity of processes while introducing significant operational risks. Any RSCIs real-time control action without detailed understanding and data about each TSO’s system, including lower voltage levels, could have unexpected impacts. That is why the TSO itself and not the RSCI should be entitled to remotely control the system for security reasons. Lastly, it would require a review and change of the existing technical and operational practices and a new definition of roles and responsibilities of the national control centres.

Further explanation

RSCIs provide concrete input to system operations.

- Operating an increasingly complex grid is a very sensitive task; any error can have enormous consequences for European consumers and the European economy. Setting up and collaborating through RSCIs represent an important shift from the national system operations procedures. Delivering the full benefits of RSCIs while keeping transition costs and risks at reasonable levels requires a careful running-in period, during which all parties involved (TSOs, ENTSO-E, national and European regulators, market participants and the RSCIs themselves) need to learn how to work together.
- RSCIs are tuned to regional needs because the coordination requirements differ across Europe depending on the complexity of the networks, the energy mix, etc. RSCIs are already an integral part of the operational planning processes of most TSOs and maximise the efficiency of coordination between them. RSCIs perform analyses that TSOs would otherwise have to perform separately and in a less optimal way. The planning processes performed by the RSCIs are an integral part of the security evaluation of the TSOs. For example, based on the calculations made in the RSCIs, TSOs coordinate and deploy remedial actions to maintain system security.
- Since TSOs do not repeat the full calculation the RSCIs perform for them, the RSCI calculation results carry very strong weight for the ensuing TSO decisions, which are contradicted only if the more detailed information and understanding each TSO has of its own system suggests an even better solution. The weight the RSCI calculation results have is especially easy to appreciate in the important tasks of capacity calculation—by nature a multi-TSO task—and security analysis—especially with respect to the identification of the best cross-border remedial actions.

The way forward: Getting as close as possible to real-time while leaving system security responsibility to TSOs at the Member States level

- RSCIs are not control centres because they have no remote control and telemetry capabilities, which are used by control centres to monitor and control the electric system and implemented by the SCADA and EMS functions (Supervisory Control and Data Acquisition and Energy Management System). To perform real-time operation, expertise and explicit knowledge of all the system details are necessary. Furthermore, RSCIs are not being developed to become regional control centres and assume an operational role. RSCIs are an integral part of the operational planning process of the TSOs.
- However, as we move closer to real time, the decision-making window decreases, and thus the opportunities for decision support decrease and the role of RSCIs is limited. RSCIs continuously review their processes to improve the support to TSOs' decision-making in system management amid the constraints.
- The establishment of regional control centres with decision-making responsibilities would require a full scale review and change of the existing technical and operational practices and a new definition of roles and responsibilities of the national control centres to avoid duplications that increase operational risks. Significant resources would have to be devoted to training personnel, who are already scarce, and to complex IT development. Moreover, centralisation of different TSO functions would increase complexity of the processes and introduce significant operational risks. ENTSO-E's preliminary analysis is that costs and risks associated with such a move outweigh the potential benefits to the European consumer. It is more important that all TSOs are members of an RSCI and that the interoperability of RSCIs is set up.
- The national responsibility for system security is not an obstacle to cross-border cooperation. The RSCI model has been developed on the national responsibility principle, and the established RSCIs currently cover 75% of the European population and are recognised as important contributors to the security of the overall network. ENTSO-E works towards applying the RSCI model everywhere in Europe according to a strategy outlined in the ENTSO-E policy paper 'Future TSO Coordination for Europe', released in November 2014. With the full deployment of this strategy, all TSOs will be

procuring services from RSCIs according to a detailed framework that ensures cross-RSCI coordination. Therefore, TSO coordination will be strengthened even more to serve internal market integration; the RSCIs will then be able to propose to the TSOs promising solutions to many problems in the interconnected European system, thus ensuring maximum efficiency. This strategy and the System Operations Guidelines constitute the optimum solution for European consumers.

12) Fragmented national regulatory oversight seems to be inefficient for harmonised parts of the electricity system (e.g. market coupling). Would you see benefits in strengthening ACER's role?

Answer

The establishment of ACER through the Third Package has proven both necessary and efficient on the way to fully implementing the Internal Energy Market. The current mandate provides ACER with sufficient tools and options for fulfilling its mandate and role. It is crucial to make full use of these provisions and also to equip ACER with adequate resources to fulfil its role in the Third Package, especially monitoring national NRAs in implementing the Third Package and the network codes and guidelines, following up on regional projects and promoting best practices.

European legislation may be required in the future with regards to retail market improvements to respond to the increasing integration of retail and wholesale markets. Such legislation (e.g., a new network code) should address issues of the TSO-DSO interface, data management, retail market integration of storage, empowerment and privacy rules for the customer and self-consumption.

In the short term, ACER should be enabled and encouraged to carry out its existing mandate of coordinating national regulatory policies to its fullest extent, be a pro-active facilitator among NRAs for cross-border projects and define to what extent and how it handles joint regional NRA decision processes as foreseen in the network codes' 'all NRAs' decisions. ACER should also promote best practices (benchmarking of national systems) among NRAs and should be given adequate resources to address issues such as research and innovation incentives.

Further explanation

ACER: More resources rather than an extended mandate

- We do not see the need for a substantial change in ACER's mandate and role. ACER needs to be equipped with the resources required to fulfil its role described in the Third Package. In particular, we believe ACER should monitor the progress of national NRAs in implementing the Third Package, follow up on regional projects, regional NRA governance and activities and promote best practices.
- In the short term, it is important that ACER is enabled and encouraged to carry out its existing mandate for coordination of national regulatory policies to its full extent. ACER's role as a facilitator among NRAs for cross-border projects requires a firm, pro-active approach. Given the increasing importance of regional cooperation in operations, planning, adequacy and markets, ACER needs to focus more on regional projects with multiple MS involvement. This should of course happen when problems between NRAs or Member States arise, but ACER also needs to define to what extent it handles joint regional NRA decision processes as foreseen in the network codes' 'all NRAs' decisions. ACER should also promote best practices (benchmarking of national regulatory frameworks) among NRAs. Finally, particular focus is needed on research and innovation incentives. For all these tasks, ACER should be given adequate resources.
- The implementation of network codes and guidelines will be extremely demanding for ACER in terms of resources in the coming years. A high level of availability of teams from ACER, the EC

and the ENTSOs will be necessary to deliver the best possible products within the ambitious timeframe set in the network codes and to finalise the implementation of the Third Package. In general, the role of ACER defined in the Third Package is adapted to the governance needs of the Energy Union. However, ACER resources need to be developed so it can play this role to its full extent.

The next challenge: Fully functioning retail markets and sufficient flexibility

- Given the importance of enabling DSR for all customers via dynamic pricing and hedging instruments, accelerated change in retail electricity markets is crucial for achieving a better functioning market in each Member State and Europe-wide while increasing RES and maintaining security of supply. Given the risks that distorted investment incentives and insufficient system flexibility imply, and given the strong market integration Europe has already achieved for day-ahead markets and will achieve soon for intraday markets, improved functioning of retail markets must occur soon, must occur all over Europe, and must occur with a minimum level of consistency across Europe.
- ACER's current powers and its conceivable increased powers would not by themselves suffice to achieve these retail market improvements. Any future ACER action in this direction needs to be founded on legislation about the interactions between wholesale and retail markets.
- Europe-wide rules are needed to facilitate access of flexibility sources at distribution level to all markets and thus better integrate retail and wholesale markets. Whether in the form of a regulation, guideline or network code, new legislation on 'distributed flexibility' will allow maximising benefits of DSR, storage, distributed generation and smart grids to the benefit of the whole power system while taking into account different roles and responsibility of existing and new players. Regardless of the specific legislative instrument, these rules should be limited to harmonising high-level principles because of the current and future diversity of DSOs and retail markets.
- ACER's role will be crucial. We suggest these key topics for this new legislation or network code on distributed flexibility: to expose all consumers to the real cost of electricity at all times, the TSO-DSO interface, data management, network fee and retail market integration of storage, empowerment and privacy rules for the customer and self-consumption. Regulation EC 714/2009 covers these topics sufficiently to allow working through the established governance triangle (EC, ACER, ENTSO-E) including through a network code, but DSOs, stakeholder and consumer organisations will need to be involved strongly.
- This new legislation or code will have the additional advantage of defining appropriate use of open IT and data exchange standards that are key to achieving the benefits of competitive retail markets at low cost, e.g., for meter data exchange, energy savings, demand response, etc. More standardisation of technology and interfaces between the different components promises higher socio-economic gain, and such standards have recently made major progress in CEN and CENELEC as well as worldwide. Proprietary technology or different standards for each country would likely delay rather than accelerate needed retail market developments. The NRAs and ACER could then later have a role in seeing that standards are implemented and maintained. This could also include standards for security and data protection.

13) Would you see benefits in strengthening the role of the ENTSOs?

Answer

The Third package has created a well-functioning TSO cooperation. ENTSO-E is aware of various alternative proposals to its structure (a foundation, an agency, a split along the ENT SOG-GIE model) but is convinced that the setting of the Third Package has delivered. The perception that the role assigned to ENTSO-E by the Third Package and subsequent legislation (Infrastructure Regulation, Transparency Regulation, ITC Regulation) is largely adequate is also confirmed by our annual stakeholder survey.

To respond adequately to its mandates, ENTSO-E needs the full depth and the knowledge of its member TSOs just as much as TSOs need a strong ENTSO-E through which to find efficient solutions at a regional and European level. The ENTSO-E platform combines its strong orientation towards the European view, the system view and benefits to customers and society at large with deep expertise and responsibility for security of supply of each of its member TSOs. Since TSOs are unbundled and neutral in the market, this is a powerful combination of crucial responsibility lived every day, with European system vision fully supportive of European energy policy goals. ENTSO-E is not a political organisation, and its notion of Europe is based on physical realities and therefore stretches well beyond the EU borders. This is also reflected in the membership of 41 TSOs from 34 countries.

In view of the objectives of the Energy Union Strategy, we propose several adjustments to ENTSO-E's mandate and governance, representing a combination of voluntary and legal measures.

Firstly, ENTSO-Es will set up proactively an independent advisory board for assessing in a legally non-binding manner how ENTSO-E works and fulfils its mandates.

Secondly, ENTSO-E will further improve its stakeholder interaction, develop co-creation taking advantage of the new stakeholder committees, and transparency (such as publication of the Assembly minutes, but also improving transparency and response on integration of stakeholder input).

Thirdly, regional cooperation is increasingly important in operations, market and planning. ENTSO-E will focus even more strongly on regional TSO cooperation. For some planning and market tasks, this may imply new regional governance from authorities and involving stakeholders, e.g., in the Pentilateral Energy Forum.

Fourthly, the TSO-DSO interface requires more attention, building on steps already taken by ENTSO-E and the four DSO associations and with EC (see answer to question 12).

Lastly, ENTSO-E's regional and Europe-wide system adequacy assessments should become the basis for security of supply and market integration at a regional and European level. ENTSO-E should play a major role in network code and guideline amendment processes, alongside consumers and the industry.

How could this be best achieved?

System Adequacy Assessment: A future basis for national and regional policy decision-making

- On the basis of the existing Regulation 714 legal mandate for ENTSO-E to develop regional and European system adequacy assessments, ENTSO-E should receive a formal role to provide these pan-EU and regional system adequacy assessments to the regions and to MS based on its evolving European methodology. This methodology should be adapted by and used across Member States to guide Member States' decisions on SoS on the basis of their national sensitivities and specificities.

ENTSO-E and stakeholders co-creating the Network Codes

- ENTSO-E and the European Stakeholder Committees should have clear and important roles in the process of amending network codes and guidelines.

- In 2014, ENTSO-E took the initiative to propose the creation of European Network Code Stakeholder Committees. In the future, the role of these committees needs to be extended. They should play a formal role in the Network Codes amendment process. They should also be used to identify the need for specific stakeholders groups, which will closely follow the development of Network Codes implementation project. As it has been the case with the latest Network Codes, ENTSO-E will also systematically organise recurrent stakeholder groups working in close relation with the drafting team for the development of future codes and guidelines.

Enhanced and coordinated inter-TSO regional cooperation

- We believe that stronger regional TSO cooperation and regional entities will be required to ensure a secure, affordable and sustainable power supply to European citizens. Coordination across regions and integration of regions remains an ambition for the future. ENTSO-E will play an important role to this end. It is important that TSOs are able to form regions that are relevant for their operation, planning and investments.
- ENTSO-E will keep coordinating and shaping the development of Regional Security Coordination Initiatives (RSCIs) and their interoperability and will organise the mandatory participation of all TSOs. ENTSO-E will ensure that regional structures deliver in due time. ENTSO-E will serve as an interface between European policy-makers and regulators on the one hand and the RSCIs and members on the other.

Convergences between ENTOSOs

- ENTSO-E and ENTOSOG are sister associations with similar mandates. There are areas at transmission system-level and with regards to their mandates in which both organisations need to cooperate closely (seasonal adequacy assessments, CBAs, stakeholder consultation, etc.). In all these areas, the ENTOSOs are always looking for close co-operation, exchanges, best practice and convergence to support each other's activities.
- Conversely, there are also important differences between the gas- and electricity transmission systems that do not allow for direct comparison and that require differentiated considerations. The structure, history and challenges of both transmission systems differ fundamentally. Therefore, there is an important degree of differentiated consideration that is necessary when assessing the roles and mandates of ENTSO-E and ENTOSOG.

Fostering distributed flexibility

- We believe that ENTSO-E and DSOs should have a joint mandate to develop an arena for a more formalised cooperation between TSOs and DSOs on relevant areas, for instance, in the new legislation for distributed flexibility mentioned in the response to question 12.

What regulatory oversight is needed?

Answer

ENTSO-E takes stakeholders' criticisms seriously and has been implementing a series of measures in response. To mention a few, ENTSO-E has reviewed its consultation methodology, extended public consultations where possible, organised additional European and regional stakeholders fora, set up interactive workshops, implemented a more user-friendly online consultation tool and is conducting yearly stakeholder surveys. We continue taking stakeholder criticisms and comments very serious and believe we can still improve on a number of aspects. However, we do not believe that changes to the current regulatory oversight of ENTSO-E are adequate per se.

The regulatory oversight of ENTSO-E resulted from a careful consideration and agreement in the Third Energy Package (and subsequent legislation) on a separation of powers, roles and competences between

ENTSO-E, ACER, the European Commission and stakeholders, with scrutiny by the European Parliament and the Council. This carefully weighted and agreed-upon balance with regards to ENTSO-E's current mandates needs to be maintained. In all those areas in which ENTSO-E is entrusted with further mandates, adequate regulatory oversight needs to be put in place.

Besides considerations of changes to the regulatory oversight, ENTSO-E believes that increased stakeholder engagement and transparency on its governance and internal processes are more purposeful, along with a strong Secretariat.

The way forward: Transparency and stakeholder engagement

- Several stakeholders have expressed concerns about the prominent place given to TSOs in the European law-making process through ENTSO-E. Some stakeholders have also asked for separation of ENTSO-E's mandated and non-mandated activities. We believe that such a split would be detrimental to the quality of ENTSO-E's work because the link to the TSOs would be weakened, which would ultimately frustrate stakeholder expectations.
- ENTSO-E will also strive to provide more explanations of its work products and provide better feedback on stakeholders' input, in particular during formal consultations (for instance, through feedback workshops). We will look for new ways to engage stakeholders beyond the traditional circle of European industry associations: civil society organisations, market participants and reaching out to less active countries or regions.
- ENTSO-E will publish minutes from its Assembly meetings and intensify invitations to representatives from ACER and the European Commission to give presentations to Assembly meetings.
- ENTSO-E also plans to set up a High Level Advisory Board, composed of recognised independent experts, who will assess the work of the association once a year.
- While it is important for ENTSO-E to maintain a formal role in the amendment process of network codes and guidelines, we consider equally important a formal role in that process for stakeholders (see our proposals on NC Stakeholder Committees).

14) What should be the future role and governance rules for distribution system operators? How should access to metering data be adapted (data handling and ensuring data privacy, etc.) in light of market and technological developments? Are additional provisions on management of and access by the relevant parties (end-customers, distribution system operators, transmission system operators, suppliers, third party service providers and regulators) to the metering data required?

Answer

There would be strong efficiency and legitimacy advantages for an appropriate single representation of DSOs in Brussels. This is becoming more important than in the past as European DSOs start shaping European rules on smart grids and retail markets, running stakeholder exchanges and being partners for ENTSO-E in preparatory discussions for new legislation on distributed flexibility.

The role and challenges of gas and electricity DSOs will become increasingly different from each other. For instance, the Commission now places rather less emphasis on smart gas metering, especially since a majority of the CBAs on smart gas metering proved negative or inconclusive¹. This response only addresses electricity DSOs.

¹http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568318/EPRS_BRI%282015%29568318_EN.pdf.

The DSO role should support and facilitate technology and market development to reach objectives such as security of supply, consumer empowerment, smart homes and networks, data management and protection. While the DSO role is limited to monopoly tasks and as such does not include market activities, the DSO role may be defined somewhat differently between countries or regions. Easy and frequent distribution of high quality metering data should be required so that smart metering potential can be fully utilised. Issues such as DSR, dynamic pricing and distribution grid management could be covered in new legislation on distributed flexibility. Congestion management warrants particular attention given the increased penetration of distributed generation and new loads from EVs and heat pumps.

For data management, there must be common standards for data exchange and communication that include the need for more clarity about the roles and responsibilities of each party to grant access to data and for usage of data. Cost efficiency, reliability, safety and security standards are also key criteria for data handling. Furthermore, data should be exchanged at the right level of detail and time resolution according to the respective needs and as soon as possible after real time when needed. It should also be noted that the Network Codes provide a detailed framework for the exchange of operational data between TSOs and DSOs and other grid users.

Further Explanation

- Access to metering data is an area in which technology development now offers new opportunities and challenges. Introduction of smart metering and remote data collection enables the realisation of objectives such as dynamic pricing, demand response, energy efficiency and savings in the retail segment. Furthermore, it offers a better foundation for grid operations and grid investments. Easy and frequent distribution of high quality metering data should be required so smart metering potential can be fully utilised.
- Both these subjects could be covered in the suggested new legislation on distributed flexibility.
- One approach is to introduce a regulated, unbundled, centralised data hub that represents one common interface from the DSOs to the consumers, retailers and third parties, securing data management and data quality and ensuring that data privacy is achieved. This could be seen as an outsourcing of certain DSO tasks to the common data hub. The benefit of such a model is increased neutrality, equal quality standards of metering data, one technology and interface for all market participants, unified approach to data protection and data privacy, efficient monitoring of market behaviour, and last, but not least, reduced total costs because one data hub can take over the tasks of many DSOs. In addition, the data hub could facilitate customer switching in an efficient and neutral manner as well as customers moving in and out. Depending on needs and regulations, access to the data hub and its metering data could also be given to other parties as mentioned in the question as well as to tax authorities, statistical agencies, research institutions, etc. One could then do all access management from a single place. A data hub will clearly define the role of the DSO and the interface to the market. A further advantage of this setup would be the facilitation of balancing and ancillary services from prosumers in cases of distribution grid congestion.
- An additional topic that merits careful attention and innovative solutions and that could be included in new legislation or code on distributed flexibility is distribution congestion management. This increasingly important and valuable DSO function will constitute a major use of smart grids, smart grid data and data hubs. A particular aspect of transmission congestion management that required careful regulatory and legislative attention is likely to also become relevant on the distribution level over the coming years: the appearance of structural congestion that for economic reasons will not be eliminated through additional distribution capacity investment. Even during distribution congestion situations, the access of customers to all markets should not be blocked unduly.

General additional comments

How should access to metering data be adapted (data handling and ensuring data privacy, etc.) in light of market and technological developments?

- Several governance models are possible and should be assessed at the national level, respecting guiding principles - developed at the European level - such as neutrality, easy access, non-discrimination, data privacy, data safety and security and proven cost efficiency. Because roles and responsibilities assigned to DSOs vary across Member States and sometimes within them, a role based governance model should be the basis of the rules in the proposed new legislation on distributed flexibility.
- Facilitating markets and maintaining operational security requires more and more detailed data on all time frames. The right incentives to give access to data from DSOs, market participants and grid users to TSOs or other entities are needed. The NCs have specified this need for more data exchanges (article 23 of the network code on balancing, article 51 of the network code on operational planning and scheduling and articles 34, 35 and 42 of the network code on operational security network code).
- Data access has to be specified. Customers own their data, so the data can only be used with their consent unless regulated activities require these data. The 'privacy by design' principle should be a prerequisite.
- In some cases, TSOs may need direct bidirectional data access to a DSO's grid users (for security analysis, activation of flexibility products).

Are additional provisions on management of and access by the relevant parties (end customers, distribution system operators, transmission system operators, suppliers, third-party service providers and regulators) to the metering data required?

- The following provisions could be detailed in the proposed new legislation on distributed flexibility:
 - Harmonisation at the European level: There must be common standards for data exchange and communication.
 - Need for more clarity on roles and responsibilities of each party to grant access to data and for usage of data.
 - Cost efficiency within the data management and data accessibility should be evaluated to meet needed levels of reliability, safety and security standards.
 - Data should be exchanged at the right level of detail and time resolution according to the respective needs. Due to improvements of IT technologies and to economies of scale, data replication and large data exchanges do not necessarily imply unreasonable costs.
 - Data should be exchanged as soon as possible after real time when needed.
 - Assess the opportunity for more transparency, which should be easier to achieve with central data management solutions.

15) Shall there be a European approach to distribution tariffs? If yes, what aspects should be covered; for example, tariff structure and/or, tariff components (fixed, capacity vs. energy, timely or locational differentiation) and treatment of self-generation?

Answer

General recommendations for transmission tariffs should also apply in principle to distribution tariffs. In particular tariff structures should incentivise efficient behaviour of generation and load to minimise the total costs of the electricity system. The capacity (kW) base of tariffs should increase, and locational aspects should have growing importance in the future. The structure to allocate costs should not distort the Internal Electricity Market. Increasing self-generation is a positive development but should not result in other consumers bearing the burden of increased grid cost recovery schemes. The prosumer must contribute to the cost of back-up generation and grid costs that allow the reception of this back-up supply.

Further explanation

ENTSO-E does not have specific views on distribution tariffs. However, we believe that general recommendations for transmission tariffs should also generally apply to distribution tariffs. In particular:

- Tariff structures should incentivise efficient behaviour of generation and load to minimise the total costs of the electricity system because the structure of grid tariffs has implications on the flexibility of demand.
- Current market developments: RES integration, market integration and security of supply issues change the nature and function of DSO networks, and tariff structures should reflect these changes:
 - Locational aspects should have growing importance in the future as exemplified through the need for distribution congestion indicators in several Member States already.
 - The capacity (kW) base of tariffs should increase (as opposed to the kWh base).
- Non-TSO costs including RES support schemes have a significant impact on the Internal Electricity Market. Some countries allocate non-TSO costs by using the TSO tariff structure, which then is also reflected in grid fees that distribution-connected customers pay. The structure to allocate non-TSO costs should not distort the Internal Electricity Market.

On self-generation

- Self-generation is an important aspect of customer empowerment and choice. From the TSO perspective, it can also be useful to strengthen energy awareness in customers, which we hope then leads to more flexibility and price responsiveness on the demand and self-generation side. Nevertheless, an increasing self-generation penetration without suitable regulation and technical control may raise network issues that should be duly considered.
- For a grid-connected prosumer, individual optimisation can be driven by the minimisation of payable energy taxes and levies, which would only be beneficial to the prosumer because it in turn increases the burden of cost recovery schemes on all other consumers. This stimulating effect of taxes and levies on self-consumption of self-generation is not a desirable but a distortive effect since it prevents both efficient allocation of distribution grid costs and efficient response of the self-generation and the local demand to market prices.
- In the case of self-generation from variable sources, support from the electric system may be needed when self-generation is not enough to complete the required consumption. The prosumer must contribute to the cost of the back-up generation and grid costs that allow the reception of this back-up supply.
- The above suggestion of more capacity- than energy-based distribution tariffs would strongly mitigate these problems and would also be better from the cost causation viewpoint.

16) As power exchanges are an integral part of market coupling – should governance rules for power exchanges be considered?**Answer**

The competitive activities of power exchanges (PXs) are already subject to regulatory oversight by NRAs (financial or energy regulators). However, future experience with day-ahead and intraday market coupling processes will reveal the effectiveness of the current regulatory oversight of PXs with regard to their functions as Market Coupling Operators (MCOs). There appear to be areas in which the role of individual NRAs in their oversight function is not clear or consistent. One example is currently applied cost recovery mechanisms via TSOs. ACER could take a stronger role and assess the line of competition versus cooperation between PXs in market coupling operation and ensure that any identified regulatory gaps are filled without hampering market development.

Background and details

- For the majority of their activities, power exchanges (PXs) operate in a competitive market environment and are already subject to regulatory oversight by NRAs (financial or energy regulators). With regard to the specific activity of market coupling and the role of power exchanges as market coupling operators, the regulation on CACM defines the areas in which NEMOs need to cooperate and in which they should compete.
- ACER should first assess the appropriate level of regulatory oversight needed for the MCO function and whether the business of PXs related to market coupling functions is regulated adequately and proportionately. Upon that assessment, ACER should ensure that any identified regulatory gaps are addressed without hampering market development (especially with regard to the competitive part of PXs' activities). ACER's assessment should take into account the results of the evaluation of the CACM Regulation, which is foreseen two years after its entry into force.
- In summary, any future decisions on possible further regulation steps on MCOs and NEMOs should be based on the experience gained through the processes of day-ahead and intraday coupling. In this context, ENTSO-E will also give thorough input to the discussion of the role and governance of PXs.

17) Is there a need for a harmonised methodology to assess power system adequacy?**Answer**

Yes, ENTSO-E sees a clear need for and clear benefits of a harmonised methodology to assess power system adequacy at the regional and pan-European levels. The ENTSO-E state-of-the-art adequacy methodology should be used as the best practice methodology because it provides common definitions of adequacy indicators, enabling the comparison of adequacy levels across all Europe. In addition, ENTSO-E's new adequacy methodology and results should become the basis for European reviews of capacity mechanisms and support schemes, providing a consistent approach for more detailed Member States' assessments.

Background and details

- Taking into account the increasingly challenging integration of variable renewable energy sources (RES), as well as the increased cross-border impacts as a consequence of the expansion of cross-border transmission infrastructure, ENTSO-E sees a clear need for implementing a harmonised methodology to assess power system adequacy on the regional and pan-European levels. Power system adequacy must cover all aspects of security of supply, both capacity-related issues (ensuring availability of supplies to avoid load shedding) and dynamic issues, sizing operational reserves (ensuring enough flexibility of supply to avoid local or larger blackouts).
- In close cooperation with all relevant EU stakeholders, ENTSO-E has been working for more than two years on the development of harmonised methodologies covering in particular the stochastic aspects of high shares of RES in power systems. This state-of-the-art pan-EU methodology should be the basis for regional and pan-European system adequacy assessments. The methodology should be implemented, proof-of-concept tested and proven to provide reliable indicators for adequacy assessment based on stochastic sequential market modelling tool(s), using efficient sequential hourly resolution algorithms. Available tool(s) for market modelling should be proven and benchmarked as being fit for purpose.
- The ENTSO-E methodology can then be used as the best practice methodology to serve as the basis for more detailed Member States' assessments. To ensure consistency between the pan-EU, regional and national levels, the ENTSO-E methodology should be integrated in ENTSO-E reports and used at the national and regional level, incorporating as appropriate the specificities and methods used by TSOs at the national level and regional levels.
- The technical expertise and the neutrality of TSOs make them best suited to identify risks for the system and adequate measures.
- The advantage of a common ENTSO-E methodology for regional and pan-European adequacy assessments is that the use of a common definition and adequacy indices calculations based on ENTSO-E's stochastic modelling tools will enable policy-makers for the first time to discuss national adequacy indices based on the same definition, indicators and calculations, regionally and across Europe. In this context, ENTSO-E's new adequacy methodology and results should become the basis for European reviews of capacity mechanisms and support schemes (see below).

18) What would be the appropriate geographic scope of a harmonised adequacy methodology and assessment (e.g., EU-wide, regional or national as well as neighbouring countries)?

Answer

Depending on the specific type of adequacy risks and needs, the geographic scope of the harmonised adequacy methodology will vary. Regional and cross-regional adequacy assessments are needed to identify best the most prominent risks and needs, which cannot be fully accounted for only on a national basis. Some level of details and sensitivities will and should be better accounted for at the national or regional level, especially with regard to decisions on measures to ensure SoS.

ENTSO-E's regional and pan-European adequacy analyses can serve as a key instrument to identify such risks because they will take into account the geographical distribution of resources (regional, national, local level) and their links to grid constraints and planning.

Background and details

- All three levels complement each other and are needed: EU-wide, regional and national adequacy analyses.

- Due to the realities of the integrated market, regional or cross-regional adequacy assessments are needed to identify adequacy risks and needs, which cannot be fully accounted for on a national basis. The increasing penetration of variable RES production and other uncertainties impacting cross-border exchanges require extension of the geographical scope to as large an area as possible. However, some level of details and sensitivities will and should be better accounted for at the national or the regional level, especially with regard to decisions on public intervention and market adaptation measures that need to be considered to ensure security of supply. National adequacy assessments take into account cross-border exchanges with neighbours. Regional and pan-European adequacy studies are needed to ensure that all national system adequacy assessments match.
- TSOs play a crucial role in developing adequacy methodologies. Cross-border synergies can only be enabled via a close cooperation of TSOs and market participants within a well-defined framework. Especially challenging issues include the calculation of limits to cross-border measures and the management of simultaneous scarcity situations. However, cross-border measures should not result in interconnector capacity reservation for this purpose.
- Regarding the management of scarcity situations, the degree to which cross-border support is available to manage scarcity situations is dependent on the relative levels of scarcity on either side of the border. When scarcity is present in a price zone and not in an adjacent zone, properly functioning market mechanisms should ensure that power flows to the adequacy-short market.
- If the levels of cross-border transfer are insufficient to resolve the scarcity or scarcity is present simultaneously in neighbouring price zones, other interventions may be necessary. Such measures may include curtailment of load as per multilateral agreements between MSs.
- However, with dynamic prices applying to all customers, especially in scarcity situations, and with improving hedging products, market mechanisms can be expected to cover any potential scarcity situations better and better as demand becomes more flexible and more price-elastic. Curtailments imposed on customers by TSOs and DSOs should not be necessary anymore, and customers' and aggregators' choices for electricity usage and comfort levels as a function of dynamic price will take their place.
- Since this perspective further increases the relevance of international differences in hourly prices and in customers' value functions for electricity usage, ENTSO-E's regional and pan-European adequacy analyses become even more important. These analyses will take into account the geographical distribution of resources (regional, national, local level)—linked to grid constraints and planning.

19) Would an alignment of the currently different system adequacy standards across the EU be useful to build an efficient single market?

Answer

An alignment of the currently different system adequacy standards across the EU is not necessary at this stage. While there are clear benefits to defining common adequacy indexes, a harmonisation of their values or standards would contradict customer choice. Nevertheless, we do see potential issues deriving from highly diverse adequacy standards across Europe and within regions that need to be addressed: for instance, possible market distortions, free riding or implicit cross-subsidies between MS. For this purpose, the role of solidarity in SoS needs to be properly defined within a pan-EU coherent framework.

Background and details

- We have pointed out in our answer to question 17 the benefits of a clear common definition of adequacy indices and of a framework such as the ENTSO-E adequacy methodology for comparison across Europe. However, harmonising the value of target indices or standards would go against of

the freedom of customers to choose the prices at which they would be willing to forego drawing electricity for certain usages. Since these customers' value functions may vary from country to country, adequacy index standardisation will be counterproductive and difficult to reconcile with principles of customer choice.

- However, the following issue needs to be addressed, i.e., different adequacy standards that could lead to market distortions and implicit cross-subsidies between MSs, or to free-riding. The rationale is that the higher the system adequacy standards, the higher the reserves, but also the higher the costs for securing these reserves. These costs have to be financed by the MS in question in one way or the other, while the reserves will be shared with neighbours in times of scarcity according to the market functioning. However, higher costs occur only in the MS with high adequacy standards, which imposes extra costs on the market, e.g., through a capacity remuneration mechanism or strategic reserves. This means it can be easier and better in line with future developments of customer choice and smart grids to mitigate this worry in the design of the capacity mechanism or the utilization rules of strategic reserves than through forced harmonisation of adequacy standards.
- The role of solidarity needs to be properly defined within a pan-EU coherent framework. The concept of solidarity and problems of free-riding need to be addressed within this framework (e.g., through the SoS Directive update), and solutions to those could lead to the establishment of some requirements for SoS at a regional level.

20) Would there be a benefit in common European framework for cross-border participation in capacity mechanisms? If yes, what should be the elements of such a framework? Would there be benefit in providing reference models for capacity remunerating schemes? If so, what should they look like?

Answer

Yes, cross-border participation to capacity mechanisms is necessary, and for that purpose, common European principles should be agreed upon. Firstly, cross-border participation to capacity mechanisms should not result in interconnector capacity reservation or distort market outcomes determining the flow on interconnectors. Secondly, an appropriately designed capacity mechanism should reveal the value of the most limiting capacity factor (whether capacity providers or interconnection). Thirdly, a practical and proportionate implementation should be ensured.

In terms of reference models for capacity remuneration schemes, a number of common guiding principles should be followed: necessity, regional compatibility, cross-border contribution to security of supply, market-wide remuneration, coherency, level-playing field, presence of exit criteria, cost-efficiency, forward looking, and commitments to deliver.

Background and details

In the short term, it is important to identify, agree upon and implement intermediate solutions for cross-border participation such as explicit participation models. The step-wise approach should not be understood as a unique path but rather as the implementation of solutions adapted to the specificities of an evolving context.

- Compatible capacity market designs would create an opportunity for fully coordinated solutions with similar benefits as realised in energy market coupling. Such solutions would be based on coordinated auctions for capacity products or coordinated trading on trading platforms. However, on the one hand, it is unclear if such solutions are preferable to the alternative of enhancing the energy-only market and, on the other hand, such a scenario seems very ambitious considering the existence of different capacity mechanisms already in place in Europe. It is easier to achieve, and

similarly promising for compatibility, to require each capacity mechanism to include in its design an explicit plan for the conditions and timing of the later transition towards non-obligatory, diverse hedging products freely designed and chosen in the market, as described above. Furthermore, the institution chosen for the mandatory regional or pan-European discussions of adjustments in capacity and RES support mechanisms (described above) should be used to discuss the pan-European effect of the different proposed capacity mechanisms and their cross-border participation rules.

- In terms of near-term cross-border participation design solutions, these principles should be followed:
 - cross-border participation to capacity mechanisms should not result in interconnector capacity reservation or distort market outcomes determining the flow on interconnectors;
 - an appropriately designed capacity mechanism should reveal the value of the most limiting capacity factor (whether capacity providers or interconnection) while ensuring practical and proportionate implementation;
 - if there are no capacity mechanism and no compatible hedging products in the neighbouring country, the interconnector itself should be able to participate in the capacity mechanism;
 - a careful design of the commitments associated with cross-border participation in a capacity mechanism is necessary. If not well-designed, cross-border participation could lead to inefficient solutions; and
 - multiple participation in different capacity mechanisms can efficiently deliver added value in specific situations, as long as overlapping commitments are avoided and feasible solutions are identified.

Would there be benefit in providing reference models for capacity remunerating schemes? If so, what should they look like?

- We believe common guiding principles and not criteria should be shared to inform the design of capacity mechanisms, if they are required. In our opinion, the main principles that have to be respected by any capacity mechanism are:
 - necessity: There is a need for a long-term vision of which market design is appropriate to meet the needs of evolving policy and underwrite the needs of EU citizens. Thus, before implementing capacity mechanisms, there should be analysis to support that current and possible future market design will fail to deliver the right investments and that there may be a risk to security of supply. This assessment should be based on the ENTSO-E adequacy analyses already described;
 - regional and cross-border compatibility: Capacity mechanisms' designs should be consistent with the European energy markets, their functioning and their objectives;
 - market-wide: Flexible generation, storage, demand response, interconnectors or other means can contribute to system adequacy, and their potential contribution has to be taken into account on a level playing field in case a capacity mechanism is implemented. Any capacity mechanism should not prevent, dis-incentivize or discriminate the use of solutions that can be an alternative to additional generation capacity. Specific requirements should be defined, and any solution allowing for meeting the needs identified should be eligible, taking into account its technical specificities and limitations;
 - coherency: Capacity mechanisms designed to maintain sufficient level of system capability (availability and flexibility) should be coordinated with support mechanisms for RES-E (as the most relevant existing and expected source of supported technologies) since there can be correlation between these distinct requirements. To assist this co-ordination, at a minimum, appropriate technical studies by national TSOs and ENTSO-E should be conducted before the implementation of capacity mechanism to inform the necessary coherency;

- level investment playing field: Capacity mechanism may create distortions between Member States. Substantial competitive disadvantage for non-national producers shall be avoided, particularly if they could lead a neighbouring country to introduce a capacity mechanism too when the system situation does not require it to ensure a level playing field for its market participants. In addition, regulatory competition between neighbouring market designs should be avoided;
- clear exit criteria: As described, the duration of the capacity mechanism should be specified or clear criteria should be provided allowing assessment of its duration;
- cost-efficiency: Member States should always consider alternatives and take the cost into account when deciding which solution to implement;
- forward-looking: Capacity markets and in particular the products being traded in those markets should be sufficiently forward-looking because there is evidence that short-term products do not efficiently contribute to security of supply; and
- commitments to deliver: For a capacity mechanism to bring real added value, capacities involved in the mechanism should be committed to ultimately deliver the services they are valued for. This can, for instance, take the form of bidding commitments on balancing mechanisms, or availability constraints. Failure to abide by this responsibility should lead to penalties.

21) Should the decision to introduce capacity mechanisms be based on a harmonised methodology to assess power system adequacy?

Answer

Yes, ENTSO-E recommends that the introduction of capacity mechanisms be based on adequacy assessments and that the ENTSO-E common adequacy methodology and results become the basis for European reviews of capacity mechanisms, providing also a consistent approach for more detailed Member States' assessments mechanisms.

Background and details

- Recent adequacy analyses underline the importance of the international dimension for the adequacy of all Member States with interconnections. The dimension of scarcities is normally in the same range of MW numbers as the interconnection capacities. Making ENTSO-E's new, common methodology the basis for decisions on capacity mechanisms is necessary to ensure that neighbouring TSOs use a common methodology to avoid inaccuracies in adequacy estimates and that the situation in all neighbouring states concerned is taken into account accordingly. ENTSO-E's new adequacy methodology and results will also provide a consistent approach for more detailed Member States' assessments.
- In general, ENTSO-E recommends an evidence-based market design as a good practice to ensure that market rules are targeted to address real security of supply issues. ENTSO-E strongly recommends that the introduction of capacity mechanisms should be based on adequacy assessments. However, it has to be acknowledged that ensuring the security of supply benefits of any SoS market design measure takes time, including taking into account implementation lead times. Long-term adequacy has a risk management dimension that imposes anticipative decision-making in uncertain environments.