European Distribution System Operators for Smart Grids

Retail energy market: Supplementary response to the European Commission's public consultation

April 2014

EDSO supplementary response to the European Commission's public consultation on the Retail Energy Market *April 2014*

Introduction

European Distribution System Operators for Smart Grids (EDSO) welcomes the public consultation from the European Commission's DG Energy on the retail energy market and commends the renewed attention of the European Commission to electricity distribution. As pointed out in the introduction of the online questionnaire, the energy market is undergoing a dramatic change. Substantial growth of distributed generation, smart metering deployment, development of demand-response, and progress with regard to grid automation are opening up new possibilities for the electricity retail market and call for a revision of current regulatory frameworks.

Distribution System Operators (DSOs) are paving the way for a transformation of Europe's electricity system, equipping consumers with smart meters, connecting solar panels, wind turbines, electric vehicle charging points and local energy storage, thus delivering power to the consumer in a reliable and cost-efficient way and creating new business opportunities for market players.

EDSO believes that the DSO's role as neutral market facilitator has to evolve together with the retail market. This is the vision defended in EDSO's response to the European Commission's online questionnaire.

Complementing the responses to the online questionnaire, this paper further details EDSO's feedback on a set of questions related to DSOs. In order to clearly respond to DG Energy's questions, the structure of this document follows the structure of the public consultation:

EDSO felt that the DSO position on questions around, what it has termed, System Flexibility Services but also Data Management, required further explanation, and so have produced two technical reports to be submitted to the European Commission in by the end of April 2014.

1. General functioning of the retail market and consumer participation

Role of the Distribution System Operator (Question 1)

Engaging industrial consumers in wholesale electricity markets has been an easy task, as a small variation in electricity consumption can have an immediate effect on the bill of energy-intensive industries. Consumers in the retail market are different: households and SMEs rarely possess an extensive knowledge of electricity markets, and do not have an immediate interest in devoting time and effort to studying different service offers.

Looking at the retail market from a DSO perspective, EDSO agrees that the following elements are needed in order to encourage consumer participation:

- Easy access to technology such as smart meters or appliances
- Secure access to more detailed energy consumption data
- Easy access to demand response services
- Easy access to energy efficiency services
- Strong consumer protection
- Market-based consumer prices
- Transparent contracts and bills
- Bills reflecting real instead of estimated consumption
- Light permitting and grid connection procedures for self-production
- Independent and competent National Regulatory Authorities

Regarding data, DSOs are responsible for measuring the electricity that is actually consumed and need to access the consumption data of connected consumers (any grid user). In the countries where the only metering operator is the DSO, the DSO is well-positioned to manage data exchanges between customers and market players. Being a regulated entity with no commercial interest in consumers' data, the DSO can make sure that consumers remain the sole owners of their consumption data while acting as a neutral data hub towards market parties that will offer, for example, demand response and energy efficiency services. As shown in EDSO's paper on Data Management[1], a DSO data management solution can be more cost-efficient than setting up another platform.

Billing (Question 5)

Bills should be easily understandable, transparent and provide relevant information enabling consumers to make sensible choices regarding their energy consumption. Introducing bills only based on actual consumption (no preliminary use) is one of the most important actions to make bills easier to understand for the consumer. As indicated in the online questionnaire, current bills are no longer sufficient for most consumers. There is a need to give the consumer a better basis for understanding their consumption and the possibility to be active on the market.

[1] EDSO paper on Data Management: The role of Distribution System Operators in tomorrow's electricity market (2014) – to be published April 2014

Pricing (Question 6)

Given that electricity markets are deregulated, as intended in the Third Energy Package, there is a possibility to have (market based) electricity prices, network tariffs or incentive-based schemes that can motivate the consumer to shift energy use from peak times to hours with lower demand.

Retail market development drivers (Question 7)

The development of retail markets will have, as a main driver, the growth of decentralised (distributed) renewable energy resources (DRES). Due to their variable nature, flexibility will become much more important in order to keep a high level of security of supply and quality of service. Decentralised generation comes with a number of benefits, but also side-effects (or externalities) beyond those originally envisioned by policy makers: investment in new network capacity, deployment of more automated devices for grids (smart grids), an increasing need for accurate consumption and feed-in data on a regular basis (smart meters), and as a result, the development of new processes to manage data. In return, these developments create new opportunities for consumers to buy and sell electricity.

2. Market Design

Role of the Distribution System Operator (Questions 11-12-13-15-17)

Defining how market players interact with each other and with regulated companies is a real challenge when looking at tomorrow's retail market. Clear roles and responsibilities are needed in order to create a level playing field and foster competition between market players. Where the DSO is the sole metering operator, it is best positioned to be a neutral market facilitator, managing, storing and distributing grid data, due to its regulated nature. In addition, the following roles should be given to the DSO, making this the most cost-efficient model for society:

- Active grid management (congestions, voltage, etc.) possible through adequate technical and market setup, which allows for tools to monitor grids on all voltage levels and direct access to relevant data from all grid users (consumers, DER, storage, etc.) with the purpose of keeping a high quality of services and protecting the security of supply
- Ability to monitor and to make decisions regarding actions from third-parties (TSOs, retailers, aggregators, etc.) when they can have a negative technical impact on DSO grid stability
- Neutral market facilitation, managing and storing consumer (and prosumer) metering data and providing third-parties non-discriminatory access to customers' data (provided the consumer has consented to this)
- Having the right (if approved at National level) to manage public electric vehicle (EV) charging infrastructure
- Owning and operating advanced metering infrastructure (can differ in some countries, i.e. United Kingdom and Germany)
- Enabling active demand by offering services for peak shaving and load control
- Providing energy efficiency advice[2] (depending on a country's regulatory framework).

[2] The Energy Efficiency Directive (2012/27/EU) states in article 9.2(e) that customers should receive "appropriate advice and information […] at the time of installation of smart meters, in particular about their full potential with regard to meter reading management and the monitoring of energy consumption.

With these cards in hand, DSOs will be able to operate the grid in the most reliable and cost-efficient way. All these tasks could be performed by DSOs with limited changes to existing regulatory frameworks. As DSOs are regulated companies and regularly scrutinised by their respective National Regulatory Authorities (NRA), the best way to tackle the trust issue that exists in some countries would be to fully enforce the Third Energy Package, which states that DSOs should be functionally and legally unbundled.

DSO branding (Question 14)

Since the adoption of the Third Energy Package, DSOs are taking steps to change their branding and clarify the distinction between their activities and the activities of their "mother" or "group" company. The table below illustrates this evolution with some examples.

New logo	New name	Old logo	Old name
	Netz Niederösterreich		EVN Netz
	Netze BW		EnBW
	Sadales Tikls		Latvenergo
	Stromnetz Berlin		Vattenfall
	Unión Fenosa Distribución		Gas Natural Fenosa
	HEDNO		Public Power Corporation (PPC) SA

The re-branding process is ongoing throughout Europe and will most likely continue over the coming years.

Data Management (Question 17)

Data and information security are crucial to build trustful relations between all market players, including the customer. Without an absolute guarantee that the data collected is handled in a secure way, it will not be possible to involve customers or create a stable basis for new business opportunities. In countries where DSOs are the sole metering operator, they are well-positioned to enable data

exchanges between customers and market players. Being a regulated entity with no commercial interest in consumers' data, the DSO can make sure that consumers remain the sole owners of their consumption data while acting as neutral market facilitators towards market parties. As shown in EDSO's Data Management paper[3], a DSO solution for data management can be more cost-efficient than setting up a new platform.

Distribution Tariffs (Question 18)

EDSO recognises that grid tariff charges represent a significant part of the final consumer bill. With ageing grids and the growth of renewables, grid tariffs (which are regulated) will increase significantly over the coming decades in order to adapt networks to new conditions of electricity generation and consumption. If the DSOs are given the possibility through national network regulation to invest in system flexibility services[4], the resulting cost for society will be lower than if DSOs continue to invest in traditional grid reinforcement. EDSO supports the following statements:

- Tariffs should be time-differentiated to enable demand response (other possibilities exist, such as incentive-based direct payments)
- Tariffs should be measurable
- The cost breakdown of tariffs should be transparent
- The methodology to calculate tariffs should transparent

A few other points need discussion and consensus. There are more than 2400 DSOs in the European Union, which are commonly defined as in Directive 2009/72/EC: "A natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity".

However, the DSOs are subject to different regulatory frameworks and business conditions. Today, more than 70 percent of the network tariffs are based on energy used per time unit (EUR/kWh), while the costs incurred by DSOs are mostly related to investment in grid capacity, i.e. the ability of the grid to accommodate the maximum amount of energy needing to pass through at any one time (EUR/kW). In order to deliver better quality of service to all, DSOs should have the possibility to incentivise customers to be efficient. Common *high-level* tariff principles at European level (such as "tariffs should support innovation" or "tariffs should be cost-reflective") could be of help to simplify the DSO business. However, tariff regulation is a national matter and up to the decision of the NRA. All questions related to the tariffs, regarding time-differentiated tariffs, tariffs favouring distributed generation or other tariff related issues are up to the individual NRAs and based on a proper assessment of the impact of such measures. The national focus is crucial, since distribution networks in Europe differ widely in terms of topology as well as current and future grid usage structure.

[3] EDSO paper on Data Management: The role of Distribution System Operators in tomorrow's electricity market (2014) – to be published April 2014

[4] EDSO paper Flexibility: The role of DSOs in tomorrow's electricity market (2014) – to be published April 2014

Concession contracts (Question 19-20)

After extensive discussions in 2011, 2012 and 2013, the European institutions recently agreed on a new Directive for the "Award of concession contracts"[5] which sets a clear framework for such contracts. Electricity distribution networks are, under some conditions, exempted from these rules. EDSO believes the questions related to the awarding of concession contracts should not be re-opened while the directive has not yet been implemented at national level. In addition, it must be noted that reducing the length of a concession contract should be carefully weighted, as a long-term perspective is needed to recover investments in electricity distribution networks.

3. Demand-Side Participation and Smart Use of Energy

National Regulatory Authority (Question 21)

The ambitious European energy policy objectives of decreasing greenhouse gas emissions, increasing energy efficiency and the share of renewable energy, not to mention the deregulation and integration of Europe's electricity markets, have forced our energy systems to undergo dramatic changes. These changes are spurring a paradigm shift throughout the entire energy value chain. A more dynamic, distributed system, with a customer focus, is replacing the old static system based on more predictable and centralised power generation. National regulators have a central role to play, leading the way and encouraging early movers by introducing national regulatory incentives for DSOs to invest in smart grids.

In-home display and other appliances (Questions 23-23.1)

DSOs can help consumers to engage further in the retail market by providing them with clear and up-to-date data on their energy consumption, thanks to smart meters and easy access to historical data, through clear and accurate bills or through other tools (i.e. website information).

Other equipment, such as in-home displays may also help consumers to better manage their energy consumption and make the most of flexibility. So-called "smart appliances" and in-house displays should be up to market players to provide and for consumers to choose.

System Flexibility Services (Questions 28-29-30-31-32)

Obstacles to demand-side participation are numerous at the moment, be they technical, economic or regulatory. However, the different purposes of demand-side flexibility should be clarified. As explained in the EDSO report[6], flexibility could be used by market parties for portfolio management and trading, or by network operators for grid stabilisation, referred to as **system flexibility services**. System services include balancing and congestion management for TSOs and voltage control and congestion management for DSOs. They could also be used for long-term planning in order to increase the DER hosting capacity of the grid and optimise investment in general. Demand-side flexibility can, thus, be used for two different purposes.

[5] inter-institutional file 2011/0437 – pending publication in the Official Journal of the European Union

[6] EDSO paper Flexibility: The role of DSOs in tomorrow's electricity market (2014) – to be published April 2014

Regarding flexibility providers (question 30), DSOs could procure services from active users who are capable of modifying their injection/consumption patterns, i.e. (aggregated) small industrial and commercial users, aggregated household customers and DER:

- *(Aggregated) small industrial and commercial users*
  Small industrial and commercial users could provide services to DSOs, either under the umbrella of an aggregator or individually. SMEs using electricity-intensive machinery, having a fleet of electric vehicles or using electricity for thermal control, such as air conditioning, water heaters, boilers, freezers, or refrigeration, would be of particular interest, due to thermal inertia.

- *(Aggregated) household customers*
  Household customers could be an important source of flexibility for network operators, as long as providing flexibility is a transparent and effortless process. Individual household provision of system flexibility services is highly unlikely due to its weak impact on the system. However, household customers could potentially contribute to a pool of flexibility through their supplier or an aggregator. Several domestic appliances, if pooled, could have an impact on grid management. Electric vehicles, heat pumps, electrical heating and air conditioning are examples of devices which can provide flexibility.

- *(Aggregated) distributed energy resources*
  A number of different DERs could be used to provide flexibility. Research projects such as REserviceS7 have shown the potential of PV and wind, but other technologies such as cogeneration and combined heat and power could also be resources worth tapping. Whereas large DER units could act individually in flexibility markets, small units, such as solar panels on a single house, will have to be represented by an aggregator to provide services.

Last but not least, if dynamic *pricing* (Question 31) could be offered by suppliers or aggregators, it must be noted that dynamic *grid tariffs*, could also be offered by DSOs to consumers. Another option would be to offer incentive-based tariffs in order to encourage consumers to shift their consumption in time.

Participation of users connected to Distribution grids to balancing market (Questions 33-33.1-33.2)
DSOs are concerned by the balancing market, especially when users connected to their grids start providing balancing services to the TSO, and are thus having an impact on distribution networks and grid security. EDSO agrees with the following statements:

- The load (demand capacity) that can be adapted by the consumer upon request should be measured at aggregated level
- Consumers should be able to enter aggregation programmes regardless of the size of their load
- On-site qualification tests for demand-side units should be carried out at an aggregated level.

[7] REserviceS project, Deliverable 6.2, "Report on the evaluation and conclusion of the DSO case studies"

As highlighted in the work on network codes, qualification/compliance tests for millions of service providers is not a realistic option. Aggregators providing balancing services should be the only entities liable for the firmness of their offer.

However, the following statements from the European Commission's consultation are more problematic:

- Network operators should be obliged to offer products, services and contracts which match the characteristics of flexibility that residential and small industrial/commercial consumers can typically provide (i.e. smaller loads for limited time)
- The full activation time within which primary reserve capacities must be provided should be sufficiently long for the demand side to prepare and react
- The minimum duration of the requested adaptation of the demand should be kept within limits that are acceptable for consumers (for example maximum 15 minutes).

The very purpose of primary reserves is to respond very quickly to frequency deviation in order to keep the electricity system stable. The Load Frequency Control and Reserves (LFCR) network code, currently under development, defines a timeframe of 10 to 30 seconds (depending of the synchronous area considered) for activating frequency containment reserves.

It must be clear that participation of consumers in balancing markets will have to be automatic, transparent and will not require any preparation. It could take the form, for instance, of decreasing slightly the heating, or reducing the cooling of a fridge for a short period of time. In any case, no action should be required from consumers, and the network operators themselves are not permitted to offer any products or services.

Technical requirements for participation in such markets are currently being set up at European level through the LFCR mentioned above, but also the Demand Connection Code (DCC) and the Electricity Balancing (BAL) network code. No further guidance should be required at European level.

Smart Meter roll-out (Question 36)

The main advantage of letting DSOs roll-out smart meters in their networks is to make the most of economies of scale and to proceed to a harmonised roll-out, making sure that the smart meters and the smart metering infrastructure (communication system, protocols) will work flawlessly together.

As long as protocols and standards are not widely accepted and as long as smart meters and different smart metering systems are not fully interoperable, enabling consumers to choose their own smart meter will not be an efficient option and may create frustration for consumers. There is also a risk of being locked-in to products from one company and additional technical issues for network operators (different arrangements can be found in member states where the DSO is, already today, not the only entity in charge of meter management, such as United Kingdom and Germany).

Electricity self-generation and auto-consumption (Question 41)

EDSO sees the development of DER as the main driver for smart grids. Self-generation and auto-consumption can be interesting for households as well as for the system and its operator. However, it does not mean that "self-generation and auto-consumption reduces the need for generation and

network capacity for society as a whole and should therefore be exempted from additional charges". On the contrary, the result of increased variable (intermittent) generation near or at the customers' premises, can be the opposite, with an increased need for network capacity and increased network losses.

As shown in the figure below, solar panels installed on the roof of a typical house generate electricity during the middle of the day, when a household electricity consumption is nearly at its lowest. In the morning and in the evening, when an average household consumes the most electricity, solar panels do not generate electricity. Households with solar panels, thus, have to use electricity from the grid and so continue to contribute to the peak in demand, as any other household. To make sure peak demand does not create a network congestion, DSOs still have to invest in the same grid capacity as before.

This situation could change if households equipped with solar panels were also equipped with batteries to store energy, but this is not the case today, nor will it be on a large scale in the near future, principally due to regulatory limitations.

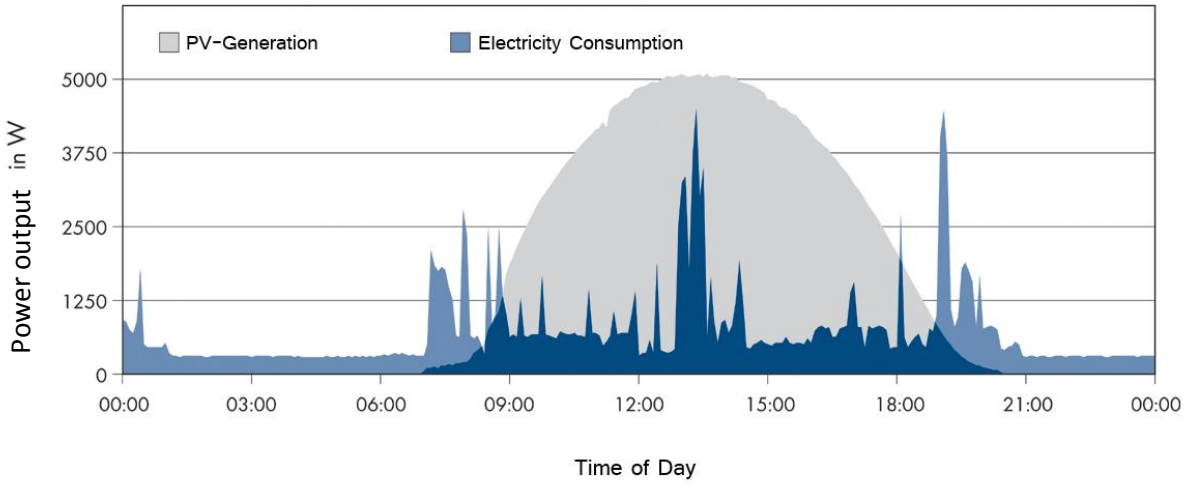

Figure 1. Generation, consumption and self-consumption on a clear summer day (four-person household and solar power plant with 5 kW peak power). Source: SMA