CEER Consultation “Regulatory and Market Aspects of Demand-Side Flexibility”

A EURELECTRIC Response paper

January 2014
EURELECTRIC is the voice of the electricity industry in Europe.

We speak for more than 3,500 companies in power generation, distribution, and supply.

We Stand For:

Carbon-neutral electricity by 2050

We have committed to making Europe’s electricity cleaner. To deliver, we need to make use of all low-carbon technologies: more renewables, but also clean coal and gas, and nuclear. Efficient electric technologies in transport and buildings, combined with the development of smart grids and a major push in energy efficiency play a key role in reducing fossil fuel consumption and making our electricity more sustainable.

Competitive electricity for our customers

We support well-functioning, distortion-free energy and carbon markets as the best way to produce electricity and reduce emissions cost-efficiently. Integrated EU-wide electricity and gas markets are also crucial to offer our customers the full benefits of liberalisation: they ensure the best use of generation resources, improve security of supply, allow full EU-wide competition, and increase customer choice.

Continent-wide electricity through a coherent European approach

Europe’s energy and climate challenges can only be solved by European – or even global – policies, not incoherent national measures. Such policies should complement, not contradict each other: coherent and integrated approaches reduce costs. This will encourage effective investment to ensure a sustainable and reliable electricity supply for Europe’s businesses and consumers.
KEY MESSAGES

- Demand-side flexibility can offer opportunities and benefits to electricity retailers, distribution system operators, and customers alike. As distributed generation and distributed energy resources (e.g. electric vehicles, heat pumps, and storage) continue to grow, this type of flexibility potential should be thoroughly investigated.

- Barriers to demand-side flexibility still exist and should be removed. This will require:
  o Implementing the Third Electricity Directive and the Energy Efficiency Directive without delay;
  o Allowing demand side flexibility to participate in intraday and balancing markets – either autonomously or through a relevant market intermediary (retailer, 3rd party aggregator, etc.) – on a level playing field with generation or storage, and to offer ‘new’ flexibility services to the distribution network;
  o A clear definition of the roles and responsibilities of the different actors involved to avoid that regulatory loopholes are exploited and free-riding is made possible on the back of all customers;
  o More capacity-oriented network tariffs;
  o A secure, efficient and transparent framework for data exchange;
  o A stable regulatory framework that supports distribution grid investments and innovation.

- Ultimately, however, demand side flexibility will not happen without the involvement of customers. The regulatory framework should thus support customer engagement while taking into account the fact that customers have varying needs and preferences. In addition, they will be able to reap the full benefits from demand response only once price regulation has been removed (or made market reflective).
EURELECTRIC welcomes the opportunity to respond to the CEER consultation “Regulatory and Market Aspects of Demand-Side Flexibility”. Demand-side flexibility and the broader concept of demand response (DR) are stepping stones towards empowering end-customers to become active deal-seekers and reap the benefits of competitive markets. Incidentally, engaged customers are crucial to help solve the new challenges emerging on the way to tomorrow’s energy system with increased renewable energy penetration and decentralisation. We understand the importance of solving the technical, behind the scenes aspects of DSF but we think CEER should have devoted more attention to the customers themselves, their needs, the potential impacts and benefits of DSR for them as nothing will be possible without engaged customers.

Consultation questions

1. What do you see as the main opportunities and benefits for demand-side flexibility in existing/future markets and network arrangements? How would you prioritise these?
   1.1. Opportunities/benefits for demand-side flexibility in...
      1.1.1. Existing markets
      1.1.2. Future markets
      1.1.3. Existing network arrangements
      1.1.4. Future network arrangements
      1.1.5. other
   1.2. How would you prioritise the responses you listed above?

   Start with industrial/commercial customers, explore potential at household level:

   - Over the past few years, EURELECTRIC has increasingly been looking into the flexibility potential across the whole value chain, from generation and interconnections to storage and demand-side participation. With the massive increase of distributed generation and the foreseen penetration of distributed energy resources (new loads such as EV/heat pumps, storage, etc.), we believe it is absolutely relevant to focus more closely on customers’ flexibility. Many large and energy-intensive industrial customers already use demand response services. Next to further promoting the take up of such services at industrial/commercial level, we believe the existing potential of household electricity customers should also be explored, taking into account their varying needs and preferences. Regulation should deal with the fact that consumers have different needs and not all of them could be interested in DR, especially when DR could be accompanied by some initial investment or would need important changes in their behaviour.

   Evaluate different opportunities for DSF:

   - We agree with CEER on the broader opportunities and benefits of DSF. For us, it is crucial to emphasise three dimensions:

     1. In well-functioning markets, retailers face increased competitive pressure; diversifying their business model and marketing strategies towards value-added services (such as DR or energy efficiency improvements) is thus not an option, but a necessity;
2. Handling the task of ensuring balance in the power system may require new DSF flexibility products in the existing service markets. This could include DSF participation in intraday market and in the procurement of balancing services (capacity) and activation of balancing energy by the TSO to balance demand and supply through the balancing energy market.

3. Distribution network constraints management: In this context, DSF is not only a future market opportunity, but also a necessity. DSOs face increased local constraints on their grid due to the boom of distributed generation (in particular variable RES) and the anticipated increase of other distributed energy resources, such as electric vehicles. New solutions should be developed to enhance the hosting capacity of the distribution grid, minimising situations when DG feed-in has to be reduced. Such solutions include new network and IT technologies, a new approach to designing the grid and offering network access, and access to flexibility services provided by consumers, DG operators and storage. Existing distribution network arrangements in most countries cannot ensure a full exploitation of the potential of DSF for such local flexibility services. A comprehensive market design for such services should be developed as soon as possible.

Consider two-fold role of the DSO:

- Distinguishing the two-fold role of DSOs when DSF is provided via customers connected to their networks: a) DSOs will be neutral facilitators and technical enablers allowing for DSF from users of their network for all the three above listed purposes. This includes the localisation and the technical validation of demand (only the DSO is aware of the network topology and can provide this information to market players and the TSO) and the provision of metering information (when metering operators) to the market players providing DSF services (necessary for billing and settlement purposes). b) DSOs will procure DSF from market players as described in 3, e.g. for smart load reduction in order to avoid blind load shedding.

- Smart grid development including sensors, meters, communication infrastructures and managements systems will be key enabler for access of DSF to existing as well as future markets. Smart grid deployment should thus go hand in hand with development of DSF.

2. What do you see as the main barriers to the emergence/functioning of demand-side flexibility? How would you prioritise these?
   a. Barriers to demand-side flexibility
      i. Legislative barriers/difficulties
      ii. Regulatory barriers/difficulties
      iii. Market barriers/difficulties
      iv. Other; please specify

   b. How would you prioritise the responses you listed above?

   c. For each of the barriers identified above, please describe the most important 'preconditions' necessary for the emergence/functioning of demand-side flexibility
Legislative barriers

Demand response programmes:

- First and foremost, EURELECTRIC wants to reiterate its strong appeal for implementing relevant EU legislation – namely the Electricity Directive (2009/72) and the Energy Efficiency Directive (2012/27) – without delay, as they will tackle the lack of technical modalities for DR access and participation and as such represent the cornerstone of successful DR programmes.
- Customers, in particular small households, will be able to reap the full benefits of participating in the competitive market by means of DR only once price regulation – in particular when not reflective of actual costs – will have be removed (or made market reflective).
- Market-based interruptible contracts – which can be considered a prototype on the way to more sophisticated DR programmes – have been available for decades to commercial and industrial (C&I) clients, and domestic customers too in some countries. This shows that when end-users realise the value of their flexibility and are able to make free choices on the contract they sign (including the price level), they can reap financial benefits while helping make the system more flexible and resilient.

Network constraints management/optimisation:

- Existing EU legislation acknowledges the importance of active distribution network management solutions. Those include the creation of new distribution system services while respecting DSOs’ obligation to ensure fair, transparent and non-discriminatory connection and access to the network. The Electricity Directive (Art. 25(7)) requires DSOs to consider energy efficiency/demand-side management measures or distributed generation that might supplant the need to upgrade or replace electricity capacity when planning the development of the distribution network. The Energy Efficiency Directive (Art. 15) allows DSOs to procure system services from generation and demand in order to improve efficiency and maintain stability of the system. These solutions are often not yet properly implemented at national level and we would urge national authorities to adapt legislation without further delay.

Regulatory barriers

Necessary market design adjustments:

- Market rules should be adapted, where necessary, to DSF requirements, in line with the implementation of the target model. In particular, EURELECTRIC believes that flexibility should be remunerated in intraday and balancing markets, and that DR resources offering such flexibility can actively participate in these markets either autonomously or through a relevant market intermediary (retailer, service provider, 3rd party aggregator, etc.) on a level-playing field with generation or storage.
- Defining a well-balanced interaction mechanism between the commodity markets and the flexibility/ancillary services market for distribution system constraints will be a necessity for achieving optimal system solutions and avoiding conflicts of interest with respect to the required network capacity. The potential of all DSF uses must be tackled jointly.
Filling regulatory ‘loopholes’:

- Defining the roles and responsibilities of the different actors involved, i.e. retailers, balancing responsible parties (BRPs), distribution system operators, third party aggregators, energy service companies, etc. is crucial to avoid that any of these actors exploit regulatory loopholes and free-ride on the back of other actors and ultimately all customers (via cross-subsidisation and costs socialisation).
- For this reason, the balancing responsibility should be clearly defined and consistently metered. There should be no overlaps or gaps in the balancing responsibility of different actors on a connection.

Appropriate distribution regulation & network pricing:

- DR programmes will only develop to their full potential if the distribution grid can integrate them. In the current regulatory framework, most DSOs are incentivized to reinforce the grid according to the traditional fit-and-forget approach. In many countries, DSOs are even explicitly prevented from establishing more flexible contracts/pricing offers e.g. via connection tariff discounts for variable generation that would help relieve constraint in the network (and allow for higher generation feed-in) as they always have to connect network users without delay and offer the same unlimited access to network capacity at any time. If this is not possible due to constraints (even if they occur only for e.g. few hours per year), DSOs have to extend the grid which results in delays and extensions that may not be efficient. In many countries, the only exception is when system security is jeopardised (‘red light’ on the traffic lights).
- Priority access rules (based on national interpretations of RES Directive 2009/28/EC and Energy Efficiency Directive 2012/27/EC) also prevent the implementation of cost-effective solutions for managing network constraints. Instead, regulation must be adapted to reward DSOs for adopting the most sustainable solutions in the long run, be they conventional investment or innovative active system management solutions including ICT and procurement of cost-effective ancillary services.
- System states should be defined depending on physical boundaries of the distribution network such as the so-called ‘traffic light system’ distinguishing between ‘green’, ‘orange’ and ‘red’ states. In the “green state” operating demand side flexibility will not affect DSO operations, other than forecasting (nomination) and monitoring of the grid. In the “yellow state” new defined interactions with the market (eg via new system services) should be defined. In the “red state” of emergency when system security is jeopardised, the DSO should have the capability to directly, and in real time, control load and/or DG. Methodologies for how system states will be monitored, calculated, audited and controlled should be clearly defined both in systems and in regulation based on the local distribution network characteristics (‘universal’ definition may not be possible, however sufficient transparency and clarity is needed). Demand side flexibility measures should then be included in service quality measures so that they are not considered as deterioration of distribution service quality. EURELECTRIC encourages NRAs to exchange on best practices in this area while respecting the flexibility on implementation provided by current EU legislation.
The energy transition will require reconsideration of cost allocation for distribution network services. For recommendation on redesigning of network tariffs, see Q.3.

**Data exchange rules:**

- As a regulated entity, the DSO is a neutral market facilitator that should be considered as a trustworthy third-party for data handling. In many countries, DSOs already own and manage metering infrastructure, facilitate technical aspects of supplier switching and act as an information hub by storing and providing metering data.
- A secure, efficient and transparent framework for data exchange should be set up. Without appropriate data, neither DSOs nor retailers and other market players will be able to perform their tasks. Customers must always give their explicit consent (opt-in) before their data are made available to third parties and must be informed for what purpose the data are used.
- Any framework regulating demand response for TSOs, such as European network codes (on operational security, balancing etc.) should acknowledge the key role of DSOs in operational facilitation of balancing services and other system services as reactive power transfer or delivery of inertia from flexible end customers to the system/TSO and not hinder the development of flexibility services for DSOs, for instance by creating extra costs. Such extra cost would arise e.g. if communication channels to network users are duplicated (i.e. both channels between DSO network user and the TSO and DSO network user and the DSO).

**Market barriers**

- Innovation will be at the core of developing DR programmes. It is often assumed that only third-party aggregators are willing to take on the multifaceted risks in developing DSF offers and that retailers have no incentives to lower their customers’ consumption, in particular if they are part of a company holding interests in the generation business too.
- In our view, this neglects the benefits that retailers have in developing DR resources such as enhance their balancing and hedging capabilities and portfolio optimisation. Moreover, it disregards the fact that sourcing strategies are very different from one retailer to the other and most integrated retailers only source a very limited part of their foreseen load requirements portfolio through their generation arm, and that even when they do so they buy electricity at the market price.
- Contrary to the consultation document that seems to hint at competition between retailers and third-party aggregators as a threat to the development of DSF products, we think that healthy competition at level playing field is the single most powerful driver to develop innovative products such as DR offers. As mentioned above, clear roles and responsibilities must be set upfront to encourage such competition.

**Other barriers**

- Technology is an empowering element. Yet, it can become a stumbling block to DR since any demand response activity is hugely reliant on processing lots of data. Therefore, equipping
consumers with smart meters and appropriate interfaces plays an important role for developing customers’ engagement and DR programmes. However, implementing demand response access to intraday & balancing markets may require capabilities going beyond those of currently installed smart meters. Access to such close to real time markets would require “second generation” of smart meters (including an ICT gateway) with enhanced smart meter reading capabilities (data would need to be collected soon after imbalance settlement which is not the case today/foreseen even for smart meters – daily or longer interval is usually assumed).

- EU standards required for smart grids implementation at EU level are still missing. The development of such standards should be accelerated.

- We also witness a tendency in several member states to restrict the numbers of offers retailers are allowed to propose to their customers. This stifles innovation and competition to the detriment of customers because offers can no longer be tailored to their needs and tend to focus on price only. In addition, it could ultimately lead to price convergence, which can be interpreted by policymakers as a signal that the market is not working properly, giving rise to new proposals that perpetuate a vicious circle.

- Last but not least, demand side flexibility will not happen without consumers’ engagement. Whilst it is clear that overwhelming consumers with information is not the best way to empower them, some national legislative provisions regulating e.g. the presentations of offers and bills, do not make it possible to strike a balance between simplicity and comprehensiveness.
3. In what way will the implementation of the Energy Efficiency Directive (2012/27/EU) affect your organisation/involvement with demand-side flexibility arrangements? (Please make particular reference to Articles 15 (4) and 15 (8), and Annex XI in your response (as summarised in the consultation document, Appendix 4).

EURELECTRIC prefers leaving to its member associations a detailed response on this question as the implementation of the EED is a national matter not in the remit of a European association.

Notwithstanding the above, EURELECTRIC would like to remind that today’s mainly energy-based network tariffs do not incentivize implementation of demand response, are not cost-reflective and may lead to under-recovery of DSO costs, due to lower energy offtake from the grid (especially in areas with increased share of distributed generation). Network tariffs should be more capacity-oriented to ensure more efficient use of the network and avoid cross-subsidisation and free riding. Appropriate approaches may include two-part network tariffs with a capacity and an energy component, capacity tariffs or volumetric network tariffs with different prices for peak and off-peak energy. Smart metering opens the door to a more cost-reflective tariff structure. It will allow DSOs to measure customers’ impacts on the grid and their contribution to peak load. Behind the scenes coordination between DSOs and retailers will be key since the retailer will be responsible for sending one unambiguous price signal to customers.
4. Have you undertaken/are you aware of studies examining the cost-benefit of demand-side flexibility measures and/or their cost-effectiveness relative to other measures

- Whilst there is little doubt that DR will eventually have a valuable role to play in the electricity markets, uncertainties about the exact potential still remain. Flexibility will depend on customers’ preferences and vary geographically and over time – according to local and regional circumstances.

- In assessing the potential of DSF, it is crucial to analyse the tests and trials that have already been put in place. The cost-effectiveness of different DSF solutions must be thoroughly analysed.

- EURELECTRIC has not undertaken any study examining the cost-benefit of DSF. However, our members are engaged in several projects aimed at engaging and empowering consumers. Examples include:
  
  o InovGrid is a 15 million euro project launched in 2009 by EDP in the city of Évora, (Portugal) aimed at equipping the electricity grid with information and devices to automate grid management, improve service quality, reduce operating costs, promote energy efficiency and environmental sustainability, and increase the penetration of renewable energies and electric vehicles. It will allow retailers and energy services companies to use this technological platform to offer consumers information and value-added energy products and services. 30,000 smart meters have been installed and an InovGrid store and communication office has been set up to provide local citizens with easy and simple information about the project’s progress. More information can be found here: [http://www.inovcity.pt/en/Pages/inovgrid.aspx](http://www.inovcity.pt/en/Pages/inovgrid.aspx)
  
  o ADDRESS is a 16 million euro large-scale integrated project co-funded by the EC under the 7th Framework Programme. It was run between 2008 and 2013 in Italy, France and Spain by a consortium of 25 partners from 11 European countries, coordinated by Enel Distribuzione. The project tried to understand how to use small customers’ potential flexibility of consumption to offer services to regulated and deregulated market players, such as voltage and power flow regulation, tertiary reserve, optimisation of purchases/sales of electricity and balancing. Lessons learnt include insights into customer interest and involvement and comparison between conventional and flexibility solutions for each study case: [http://www.addressfp7.org/](http://www.addressfp7.org/)
  
  o ADVANCED is a 4 million euros project co-funded by the EC under the 7th framework programme, launched in December 2012. It makes a comparative analysis of different active demand pilots run in Europe (ADDRESS, Edema, Enel info+) and internationally to identify best practices and assess active demand impact, in order to allow such programs to be scaled up and replicated all over Europe: [http://www.advancedfp7.org/](http://www.advancedfp7.org/)
  
  o In the Netherlands, Enexis is working on a project involving a new solar powered washing machine allowing customers to maximise the use of sunshine with the help of the smart grid. Residents of the city of Breda will be able to select the most favourable time for using this cheap and sustainable form of energy. The system will give them information about their energy usage and record their preferences. Testing
the washers in a controlled population will help to develop the technology and provide an understanding of how people use it. In particular, the test will demonstrate whether enough customers are ready to make use of this type of energy. A website created for this purpose will keep them informed of all the details: [http://jouwenergiemoment.nl/](http://jouwenergiemoment.nl/)

- In Belgium, the Linear project studies ways in which households can tailor their electricity consumption to the amount of solar and wind energy available, both in terms of technology and user interaction. Twenty partners have teamed to make the project a success, including EURELECTRIC members Eandis, EDF Luminus, Infraxm, GDF Suez (Laborelec). More info on the project: [http://www.linear-smartgrid.be/](http://www.linear-smartgrid.be/)

- In a joint report published in 2010 (Smart Grid in Denmark), Energinet.dk and the Danish Energy Association analysed how the power system within the framework of an increasingly open and international market can be efficiently converted to meet future challenges. Based on the report’s economic analyses, the conclusion was that a Smart Grid, improved market coupling and strong transmission connections to neighbouring countries together represent the best socioeconomic method for handling the future challenges inherent in using large volumes of wind.

- ESB Networks, the Irish DSO, is working with five industry partners including the TSO on a Demand Response project which will utilise the demand flexibility offered by advanced domestic thermal storage heaters and electric vehicles to offer system support services. The project ‘Enernet Ireland’ will also examine the revenue opportunities presented by this project including the payment for system services, price arbitrage and deferral of CapEx investment. ESB Networks is also delivering a real time demand response management system (“D(d)RMS”). In its role as a neutral facilitator of demand response, ESB Networks will through this system make distribution capacity available to 3rd party DR operators in a manner which ensures that power quality and network security are maintained at all times. This innovative system ties together real time network monitoring, connectivity and outage management, and flexible real time interaction with 3rd parties via an online system adopting the OpenADR protocol.
5. **Are there any other/wider considerations which we should take into account?**

- We should not neglect the fact that DSF represents only one form of flexibility. Flexibility provided by back-up generators, integrated wholesale markets and storage also needs to be taken into account.
- Demand Side Flexibility will not happen without customers’ engagement. We believe more emphasis should be put on how to empower and engage customers. Whilst a lot will depend on innovative products developed by retailers, the regulatory framework should support this by e.g. not being too prescriptive about the level of information that must be provided to all customers without taking into account their varying needs and preferences.
EURELECTRIC pursues in all its activities the application of the following sustainable development values:

**Economic Development**
- Growth, added-value, efficiency

**Environmental Leadership**
- Commitment, innovation, pro-activeness

**Social Responsibility**
- Transparency, ethics, accountability