

## **Response to ERGEG's Public Consultation on Smart Grids**

The EU's energy policy targets for 2020 set by the Climate Package (reducing CO<sub>2</sub> emissions by 20%, 20% of renewables in the energy consumption and improving energy efficiency by 20%), represent a considerable challenge for the energy sector. For the electricity grid, this triple commitment is even more challenging, as it actually means for example that approximately 35 % of all electricity will be generated from renewable sources. In addition, more electricity applications will appear in the future.

EDF would therefore like to stress how challenging and costly it might be to make the networks "smart" enough to accommodate the new distributed generation technologies and at the same time exploit the capabilities of Demand Side Management (DSM) so as to both achieve high levels of efficient use of energy and meet the EU targets.

EDF therefore welcomes the opportunity given by the ERGEG consultation to express its position on this interesting but difficult issue.

Before answering the specific questions raised in the consultation, EDF would like to make some preliminary remarks:

- Funding for Smart Grids is a costly process that comes at a time when, in many countries, significant investments are necessary to enable electricity grids meet their basic function. It therefore might not be possible to fund everything at the same time and financial decisions could lead to delay some investments in Smart Grids.
- A business model must be invented for Smart Grids, which allows to equitably share the funding between the different stakeholders: customers, suppliers, service providers, network operators, producers (addressing the issue of extra costs due to micro-generation development and, notably, their necessary contribution to balancing services), and third parties.
- More generally, the magnitude of financing costs, the diversity of stakeholders who could benefit from the development of Smart Grids, but also uncertainties about the economic impact of these technologies invite to imagine new forms of financing.
- Among those various stakeholders, particular attention must be given to local and regional authorities, since they have shown interest for the smart grid issue, often while drafting or implementing local or regional energy and climate policies. Therefore, they should take part in the discussion aiming at defining the role of each of the stakeholders in the process (prescriptive role, financing role, etc.).
- The approach to Smart Grids should be both user-centric and addressed from a global power system perspective.
- During the period of research and development, it might be useful to facilitate cooperation between operators, especially between regulated and non-regulated operators, because Smart Grids could benefit both these sectors.
- To facilitate the effective development of Smart Grids, it is also essential to allow cost minimization in ensuring interoperability between the various technologies across the European Union.

## Section 1 – Introduction

### 1. Do you consider that networks, transmission and distribution, are facing new challenges that will require significant innovation in the near future?

Electricity networks are clearly facing new challenges that will require significant innovation in the near future. The development of decentralized renewable energy sources and intermittent generation, the emergence of the electric and rechargeable hybrid vehicles and electricity storage, and the new possibilities of demand withdrawal or reduction allowed by smart meters, are leading to new ways of management of the supply-demand balance and of the networks.

From a **technological** point of view, this implies smarter grids : potential changes in the local meshing, task automatization, self-healing networks, new generation of smart captors and high-speed IT systems able to manage internal and external flows of data. This also implies a cooperation in interoperability between European network operators to define shared standards in the near future.

From a **financial** point of view, new ways of financing and new regulatory frameworks will have to be studied, in order to face large-scaled investments, to give the operators the incentive to invest with a fair return of investment. Indeed, regulators will have to assess incentivisation of network companies to pursue value for money of innovative solutions. Thus, additional regulatory support will be needed.

From an **organizational** point of view, transmission and particularly distribution operators will be impacted through the automatization and dematerialization of many tasks, the emergence of new tasks and hence the need for new skills.

All those components will allow network operators to innovate in the “rewriting” of their business model.

### 2. Do you agree with the ERGEG’s understanding of smart grid? If not, please specify why not.

The definition used by ERGEG is not precise enough. As underlined in the paper, it is a definition among others, and there is unfortunately not yet a reference definition of Smart Grid.

From a regulatory point of view, it could be an issue as it is obviously difficult to regulate - or to set financial rules - for an activity which is not precisely defined and segmented.

### 3. Do you agree that objectives of reducing energy consumption impose the need for decoupling regulated companies’ profit from the volume of energy supplied? How can this be implemented?

We partially agree on the fact that, on the long term, the objective of reducing energy consumption imposes the decoupling between regulated companies’ revenues and the volume that is supplied.

Generally speaking, network operators income depends on the transmission price level allowed by the regulator, as a result of a ratio between, on the one hand, network costs including capital cost and, on the other hand, energy consumption on the grid.

The new context implies less consumption from the grid, either due to consumption reduction, or to micro generation development, which will cause unbalance on revenues and costs. It’s important to consider as well that Smart Grids might locally enable higher levels of

network utilisation and higher load factors. Hence, technical losses could be higher with Smart Grids, even if non technical losses could decrease thanks to them.

On the short term, there are appropriate regulatory solutions addressing this issue (immunisation from revenues variations on a yearly basis).

On the long term, major evolution of consumption implies that stakeholders must think of a new tarification model, more based on capacity payments than on consumption from the grid.

Moreover, regulators, in close cooperation with suppliers, network operators and their shareholders have to set transmission and distribution price, compatible with the investment effort.

## **Section 2 – Drivers for smart grids**

### **4. Do you agree with the drivers that have been identified in the consultation document? If not, please offer your comments on the drivers including additional ones.**

We do agree with the drivers that have been identified in the consultation document. However, in the French context, where local authorities are the owners of the grid, we could add one: the growing pressure from local authorities, which are getting more and more involved in local energy policies. This new trend could have a significant impact on the investment trajectory of the distribution operators and the network performance (particularly regarding the number and the length of power cuts), through local contractual requirements (in addition to the legislative targets).

## **Section 3 – Smart grid opportunities and regulatory challenges**

### **5. Do you agree that a user-centric approach should be adopted when considering the deployment of smart grids?**

Although a user-centric approach is essential to the understanding of what is at stake for major players, we believe that the issues raised by Smart Grids tend to cross the traditional boundaries between DSOs and suppliers. An approach that would be only user-centric would fail to identify those issues.

A complementary approach should be to adopt a global power system perspective. The objective is to assess the costs and benefits for the entire power system economy for each major development related to Smart Grids and to select the most effective ones from this global point of view (and not only from one single user perspective). This systemic and global approach is needed to evaluate the real interest of Smart Grids which is a welfare interest, the costs of which have to be socialized.

### **6. How should energy suppliers and energy service companies act in the process of deploying smart grids solution?**

Energy Service Companies and aggregators can certainly play a role in the development of Smart Grids. However, their insertion in the energy value chain should not be detrimental to the efforts of suppliers.

Suppliers will not invest massive amounts beyond the meters in order to develop the smart homes if the profits incurred benefit at the end of the day to the energy service companies.

**7. Do you think that the current and future needs of network users have been properly identified in Section 3.3?**

In section 3.3, the needs of different network users are discussed.

We propose to add public authorities (local, regional or national) as one of the major stakeholders of the power sector, to this list, because Smart Grids will be one of the key contribution in the next future for building up more effective and consistent public energy policies (for example : smart cities...).

**8. Do you think that the main future network challenges and possible solutions have been identified in Section 3.4 and 3.5 respectively? If not, please provide details of additional challenges/solutions.**

The main future network challenges and possible solutions are identified in sections 3.4 and 3.5.

However in several European countries, we can see a need for 'basic' network investments in order to restore the performances of the 90's (mainly quality of service...) and compensate for some lack of investments in the last decade.

Hence, a specific challenge could be in several countries, for the next future, to finance both 'basic' network investments and 'new' investments and innovative solutions for Smart Grids.

**9. Do you expect smarter grid solutions to be essential and/or lower cost than conventional solutions in the next few years? Do you have any evidence that they already are? If so, please provide details.**

If Smart Grids were cheaper than traditional grids, there would then be no need for incentives and regulation for development. Programs such as smart metering rollouts have a negative Return on Investment, and would therefore not be acted on financial motivations only.

There is thus a necessity to partly go beyond traditional financial criteria (because cost effectiveness might not be the only input), and consider the broader picture of social benefits and positive externalities, such as climate change. This cannot happen without regulation.

**10. Would you add to or change the regulatory challenges set out in Section 3.6?**

It seems difficult to oppose the regulatory challenges outlined in Section 3.6. EDF therefore essentially shares the ideas but would however like to emphasize two points:

- As written in the document: « *The regulatory framework should enable the integration of the new services in the electricity network sharing the possible extra costs in a fair way among those shareholders who incur them.* »
- Because Smart Grids are likely to benefit all at once customers, network operators, suppliers, and third actors, an innovative way of financing and sharing the burden among these different actors must be found.
- While Smart Grids are in an experimental period, the lack of communication between suppliers and DSOs could lead to sub-optimal solutions, as in the case of smart meters design. One of the challenges facing regulation concerning Smart Grids is then to imagine better cooperation between regulated and unregulated businesses in order to find solutions which ultimately benefit network operators, suppliers and customers.

## Section 4 – Priorities for Regulation

### **11. Do you agree that regulators should focus on outputs (i.e. the benefits of smart grids) rather than inputs (i.e. the technical details)?**

Yes. We believe that the main challenge lies in regulation, not technology.

### **12. Which effects and benefits of smartness could be added to the list (1) - (7) presented in Section 4.1, Table 1? Which effects in this list are more significant to achieving EU targets? How can medium and long-term benefits (e.g. generation diversification and sustainability) be taken into account and measured in a future regulation?**

The proposed list appears to be exhaustive, but we consider that a focus should be made on manoeuvrability and flexibility gains for the system and on potential indicators of these gains (for example, the proportion of flexible generation in real-time load).

We also think that performance indicators of increased sustainability should not be limited to the reduction of carbon emissions. The share of electricity produced by renewable sources in decentralised electricity generation could be another pertinent indicator for this issue.

We consider that items (1), (4) and (5) are more significant to achieving EU targets.

### **13. Which output measures should be in place to incentivise the performance of network companies? Which performance indicators can easily be assessed and cleansed of grid external effects? Which are suitable for European-level benchmarking and which others could suffer significant differences due to peculiar features of national/regional networks?**

Few performance indicators can easily be assessed and cleansed of grid external effects : there are structural factors, specific to each operator (consumption density, burying rate of the lines, local environment conditions, network structure, size) ; some factors are imposed to the operators (tax system, tariffs of access to transmission network); other factors are partially monitorable (losses, depreciation charges) ; the operations regarding both the network itself and the customers (residential and non residential) are the only factors totally controllable by the DSOs.

Therefore, suitable performance indicators, allowing a European benchmarking, are difficult to define. However, if such indicators have to be defined, they will have to take into account the peculiar features of national networks and easily assessable.

Current indicators regarding for instance the quality of supply (duration and frequency of interruptions per customer), quality of service (such as connection time) do already exist either at a national or a regional level in each country. In reference to the subsidiarity principle, other European indicators should not be legally restrictive.

Besides, they should be beforehand discussed within the appropriate European consultation framework (ACER, ENTSO-E,...), in compliance with the 3rd Energy Package, in close cooperation with representatives of the network operators shareholders and the suppliers.

**14. Do you think that network companies need to be incentivised to pursue innovative solutions? How and what output measures could be set to ensure that the network companies pursue innovative solutions/technologies?**

Incentives for network companies to develop innovative solutions could be needed considering:

- on the one hand, the challenge (see Q/A 8) of increasing ‘basic’ network investments and ‘new’ investments in innovative solutions for smart grids (see Q/A 8 and 9),
- and on the other hand, the risks linked to fast obsolescence in new IT technologies.

The definition of the incentives that could be set is a specific issue.

**15. Do you consider that existing standards or lack of standards represent a barrier to the deployment of smart grids?**

We believe that interoperability is a very important issue, especially in the case of end-use applications. Proprietary solutions promoted by suppliers or third parties should not hinder customer choice.

We believe in the development of smart appliances that will react to the suppliers tariffs in order to minimize both carbon footprints and customer bills. This development will only happen if both customers and domestic appliances manufacturers have a clear view of the technological framework : though it seems too early to enforce standardization, standards will be needed in the near future in order to build trust.

**16. Do you think that other barriers to deployment than those mentioned in this paper can be already identified?**

An additional barrier to deployment could be the lack of acceptability by the end-users, concerned with the intrusion of smart home services and IT systems (consumption metering in real time, connection of all the home-equipments to a centralized server, property of the private data,...) in their private lives. Close attention should be given to the issue of private data property and treatment in relation with smart grids.

**17. Do you believe new smart grid technologies could create cross subsidies between DSO and TSO network activities and other non-network activities?**

EDF believes that smart grid technologies are not liable to create cross-subsidies between DSO and TSO network activities and other non-network activities or to hinder in any way competition between suppliers provided the functions offered by Smart Grids are open on a transparent and fair basis to all suppliers, their costs socialized and mentioned as such on the consumers' bill. It is also essential to let suppliers have their say in the definition of these functions in order to allow them to develop extensions if necessary. The cost of these extensions should then be borne by the supplier.

**18. What do you consider to be the regulatory priorities for electricity networks in relation to meeting the 2020 targets?**

The 2020 objectives (increased use of renewable energies, reduced energy consumption and reduced emissions of greenhouse gases) will obviously have an impact on the management of electricity networks and bring major regulatory actions:

- the management of electrical systems has been largely achieved by the use of great power units ensuring a stable and continuous generation. The development of small units using renewable energy will only be possible if the generation of these small units

can be actually managed by the electrical system. Smart Grids could help this management.

- Still, the drop in consumption shall be facilitated through more "traditional" ways as well : losses could be reduced using higher voltages, or through implementation of network tariffs encouraging the use of electricity in less tensed periods.
- The growth of renewable energy would probably also be facilitated by the implementation of network tariff provisions that would make economically more attractive the storage of the energy produced by renewables.
- Regulation will have to address the financing issues, and doing so allow the appropriate investment arbitrage from operators.
- Regulation could allow higher cooperation between regulated and unregulated businesses at research and development stages.
- Technologic standardization on basics or interoperability might be accomplished through regulation at EU level in the near future.

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