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This document is SAGEMCOM contribution to ERGEG position paper on Smart Grids

1.3 Questions for public consultation

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?

Challenges will be very different according to the level of grid to be considered.

Transmission level

Most of the Transmission Grid interconnected through out Europe can already be considered as a Smart Grid. The concepts of security; self healing, load management, load flow control are already deployed and most of technology to achieve those objective already in place. An important step will be to establish links with the other stakeholders (producers, DSOs, retailers and service provider). We do not think it will require significant innovation. The real challenge is to maintain investment to support the increase of global energy exchange through out the network to guarantee the use of renewable energy.

Distribution level

Distribution Grid is now facing the first step of a revolution with the unbundling of distribution and supply, Then the introduction of small scale distributed renewable production will be at the beginning more a problem for DSO than for TSO. As the roll out of distributed production is only at the beginning, the first grid instability will appear in particular limited areas at DSO level. Statistics will be in favour of TSO. In the future the introduction of PEV will be the following problems. So the global problem for distribution grid will be how to transport more energy, facing an increase of instability of use and production, avoiding deployment of new wires.

The current state of the art is not to have many remote control elements over the distribution grid. Distribution grids are more conducted by using the statistical model gathering information in differed time (customers' annual consumption and profiling). It will change in conducting network using a more real time model based on clouds of sensors, communication and data management. A first challenge will be industrial; how to combine new sensors inside standard network elements to minimize investments and deployment costs.

To collect all the information from the networks of sensors, communication will be the most important challenge. Today there is no large communication link used for low part of MV and LV grid operations. Grid management can not justify to deploy its own communication infrastructure. DSOs need ground breaking in this domain to make the communication cost supported by other activities. The communication infrastructure needs to be shared. Different approaches are considered today in Europe depending on the grid operator in charge. Some consider sharing the investment with smart metering, when they are in responsibility of metering operations, other will have to rely on public communication networks. The communication strategy will specify how deep DSOs will be able to monitor the network in real time. Innovation in the last mile communication over the distribution network is a very important challenge to go deeper in the network monitoring.

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Considering data management, the first idea is to duplicate systems used by TSO to DSO. The fact that any node or link is globally critical for TSO and not for DSO and the size of network make the problem fully different. So data management will be where innovation needs to take the most important place. In our mind, the huge amount of data and the difficulties of communication will conduct to have distributed intelligence over the network, to collect raw data from the clouds of distributed sensors and provide elaborate information with added value to the central systems.

Retailer and Service Provider level

Retailer level will have a key role in smart grid to promote and to enable elasticity on energy demand and on small scale distributed production. They are the ones in contact with consumers and "prosumers", the challenge is to get their involvement.

Customer Level

Today's end-customer has very low involvement in energy saving. The new challenge is to get his involvement. Innovation in the home automation domain, in connection with the development of ICT, will provide all the innovations to act for him.

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

   We are fully in line with ERGEG's position. Smart Grid is not a fixed concept. The requirement of Smart Grid needs to be defined in terms of benefits and not technology. Smart Grids will be built in a progressive manner as grids are renewed and expanded.

   We want to reinforce the customer centric approach. The grid does not stop at delivery point at customer site. The customer is part of the grid. And we do not consider that we will not have a Smart Grid without a Smart Customer and a Smart Small Scale Producer.

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?

   The traditional role of regulated companies on customer is to give an available power at a stable voltage. Now they are involved more globally to guarantee grid balance and to promote energy efficiency. They will have a new role to unable services to the customer. To unable the development of distributed energy and more over with the coming Plug-In Electrical Vehicle their effort will not be in correspondence with the volume of energy supplied. Thus variable contractual power is a more strategical point and the ability to adapt dynamically the effective power called by customer to grid requirement must be valued. The effectiveness of power level adaptation by the customer on regulated companies' requirement must be considered.

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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 are in line with the explanation of drivers.

   On the five points listed in §2.4 on point 3 we will prefer the title “Efficiency and flexibility on demand” instead of “Active end-user participation”. Smart Grid is not interested on the end-user participation by itself; but it’s a strategical need to achieve global efficiency.

   Concerning Distributed generation, it is mentioned in §2.4: “The Generation can not be considered during the design of distributed network…” We disagree on “can not”. We agree that in most case margins will be sufficient for the initial deployment. We agree that a new distributed generation implementation can not be the driver for a strong local rework of the network. It has to be taken into account on any new implementation over the network like Smart Metering or Distribution Station Remote Monitoring. And in long term if we imagine massive deployment, it will be required.

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?

   Deployment of Smart Grid will not be a unique act. It will be progressive, incremental and some time parallel developments and deployment.
   As it is a global thought at all level of the system, we cannot consider it will be only a user-centric approach. We agree that today probably the most sensitive point is the flexibility of demand, which is more an end-user problem. This can conduct to prioritise development actions toward end-user.

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

   We consider that there is no Smart Grid without a Smart Customer. Suppliers and Energy Service Companies haved contract with the customer; they will be the ones in position to propose services and interface equipments for the customer to take part in Smart Grid. Demand Side is not devoted to production management it can also be used for grid load management.

   From the past the first (small) step toward smart grid was multi tariffs. Actual proposals for multi-tariff system using ripple control or radio is already remote operations in the sense of smart grid, but not very flexible.

   Suppliers and energy service companies have already started a step ahead with the development of proposals of “Energy Box” and web portals. Those can provide different level of services to small and larger customers:

   - Follow customer behaviour
   - Customer advice
   - Real time personalised information to customers
   - Remote control of load at customer level for DSM
   - Remote management of small scale production
   - Connection with Home Automation or Building Automation

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

   We agree on all the needs identified for the future of network user.
   In addition we must consider that the end customer has no native interest in grid management and today a poor elasticity to energy usage. He needs to be stimulated and we agree on the points described in §3.3.2 considering how to promote his interest. But the operational need of end customer is to have fully automated process and equipments acting in the shadow.

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.

   We consider that generally speaking all aspects of Smart Grid have been identified in the document;

   However different major points have not been discussed:
   - The ownership of data and how they will be shared between stakeholders.
   - Unbundling of distribution and supply may conduct conflict of interest in specific situations.

   Shared data between stakeholders in differed time will not be a big issue. It's only a matter of standard IT technology using shared data base with different access right sand privileges. The issue will be more on real-time data.

   A good example of combination of those problems will be the Prosumers network capacity planning and activation. Today we rely on network margins, tomorrow with a large scale deployment it will require a more or less real time control for the effectiveness of distributed production and ability to readapt periodically the planning of energy availability over the network; this in connection with the efficient use of transport capacity. In this example the data will be used and actions taken at different levels:
   - Customer
     - Take automated action of connection or disconnection following information on price and incentives
   - Supplier
     - Will have a global management of all the production with a centralised approach
   - DSO
     - Will use data at local level, with local intelligence to control local grid stability
     - Will use data at centralised level for global load balance.

   If a coordinated action is not taken between DSO and suppliers, conflicts of interest may results.

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.*

The situation will not be equivalent at all levels.

DSO

At the first stage for the DSOs, considering network equipments, they do not expect that Smart Grid functionalities will be deployed with extra costs. Most deployments of equipments on the network will not be done specifically for Smart Grid. New functionalities will be deployed taking the opportunity of other deployments (like Smart Metering) or with the natural renovation of the grid. Some additional equipment will be deployed but at a marginal cost (for example installation of meters at substation level included in Smart Metering deployment, at the occasion of renovation of substation using new equipments with communication facilities…). The challenge is at the industrial level to provide new equipments including communication interface with the lowest impact on price level.

At a later stage in case distributed intelligence is required over the network extra cost may be required. If the deployment of such equipments is taken enough in advance, it can be shared with other network elements. For instance, a Smart Data Concentrator installed at substation level for Smart Metering, with a sufficient bandwidth of communication and computing capability to run parallel software applications will be able to manage network of sensors on the grid and also to aggregate data with high added value for the central system.

Communication infrastructure may be shared with Smart Metering if operated by DSO or based on public network. Very low specific investment will be done.

The main specific investment and expenses will be for administration and IT systems.

Suppliers and Service providers

The main possibility for suppliers and Service providers to take part in smart grid will be to interact at the customer side. They will have to invest in customer interface equipment: (EMS, Energy Box…). For this, suppliers will support the main specific investments and transfer it directly or indirectly to the customer bill. We must note that industrial cost for customer interface equipment will decrease dramatically with the increase of volume.

In most case they will try to reuse existing communication network available at end-customer premise (Telephone or Internet access). So communication costs will be as low as possible.

As for the DSO case, a significant investment will be for administration and IT systems.

Consumers and Prosumers

Active consumers will have to pay on their monthly bill for additional service provided by the Supplier or Service provider, as consequences of what we have seen previously. If they want to take a real advantage of the interface provide by the Supplier or Service provider they need to invest in their home / building network for automatic equipment. This will be a marginal cost for new installation or in case of refurbishing but a significant one for existing installations.

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

    We do not see any additional points on this topic.

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)?*

    There is no interest to go for Smart Grid for itself. Smart Grid functions will be rolled-out, as we said previously, in a very progressive manner taking the opportunity to rely on other deployments. Many investments will not be done directly for smart metering and also in advance for the use as smart grid functionality. For those reasons technical details cannot be avoided. Regulators will have a huge role to survey investments of regulated stakeholders to take into account the future Smart Grid functionalities. In any case, it is obvious that the main focus must remain on outputs.

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?*

    We will not add any benefits than the ones listed by ERGEG.

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?*

    As an equipment manufacturer and telecom solution providers we will not provide any opinion on this subject.

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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?*

As energy cost is very low, direct return of investment on smart grid for network companies will be very difficult. That's why they need to take all opportunities to minimize expenses on this topic. Most of final returns are global for the whole society. We cannot imagine network companies not to be incentivised to pursue innovative solutions.

If we take the example of Smart Metering, as it is explained in the document, Smart Metering is not Smart Grid, it is a necessary and not sufficient requirement to develop Smart Grid. But, if the deployed smart metering system, which is currently compliant to today standards, is too dedicated to metering, it will not be possible to reuse Smart Meters as sensors over the network and / or the communication infrastructure will not be able to support real time management or support non metering devices. Such a Smart Metering system will provide elements to achieve some functionalities of Smart Grid (deferred load management…), but some other (outage management, grid stability control…) may not be accessible at an affordable price. Today's regulation try only to impose smart metering, without incentive the network company will minimize the cost and limit their effort to the legal requirements and jeopardize the future.

On the industrial side there are also consequences, as network companies have a poor ROI on Smart Grid functionalities; they will keep a high pressure on equipments prices. Equipment manufacturer and solution providers need large investment to provide innovative solution keeping low level of price. So they also need to be incentivised for such developments.

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

As Smart Grid functionalities rely on new concept, actually there is no standard available.
We must be extremely careful about the fact that today when we talk about standards it mainly concerns equipments and systems. Following European countries legal and economic models are different. Also networks and operation on network are not standardised, and are very different and they may also vary in the same country in case of being spread on a regional basis. We also need to be caution about the fact that other innovations on the grid will be deployed before the decision to implement Smart Grid functionalities.

In any manner standardisation must reduce numbers of variance developed around a single technology basis.

Without a strong standardisation definition at end-customer level it will not be possible to connect customer interface devices (EMS, Energy Box…) provided by suppliers or service providers to automate home or building appliances that would have been bought on the free market.

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

A major point providing barriers for Smart Grid deployment is delaying it and the incompatibility with other investments.
As most part of investments for smart grid will not be supported by other budgets, the choice will be critical. Smart Grid functionalities and technical solutions are not yet fully defined. Therefore the choice of equipments or solutions needs to be imagined to support unclear future smart grid functionalities or it may lock the system for decades. Regulators will have a key role to survey that investments are done with sufficent efforts for the future.
Equipment manufacturers and solution providers are continuously proposing new innovations. With a very large choice of different technologies users may be lost and may delay their investments in waiting for the next much more promising technology. Standardisation will have to guarantee continuity of solutions for investments over the years and future requirements.

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