

EREG Smart Grid consultation (E09-EQS-30-04)

Response from Centrica March 2010

SOME KEY POINTS FROM OUR RESPONSE

- In view of the widespread ambiguity across Europe about what is meant by the term 'smart grids', we propose that where smart meters and smart grids are incorporated together, they are referred to as 'smart power systems'.
- It is essential that smart grid & smart power system developments allow the participation of all actors and capture the requirements of both users and other stakeholders.
- In general smart grid solutions must be supported by a business case that is signed off by stakeholders. The benefits assumed for smart grids must be incremental to those assigned to the smart meter activity.
- Networks will need to view suppliers and other stakeholders as partners in delivering solutions, and new frameworks, both regulatory and commercial, will be needed to support and incentivise such arrangements.
- Suppliers maintain the customer relationship and are best placed to aggregate demand side management, bundling new services and products for networks.
- Customer engagement will be a crucial factor both in encouraging behavioural change and embracing new technologies.
- NRAs should focus on reshaping existing forms of regulation in order to accommodate smart grids, in particular where price controls cover several years.
- It is not necessary to decouple regulated company profits from the volume of energy supplied; so long as revenue drivers and associated incentives are specified carefully, linking revenues to consumption should not lead to excessive profits.
- Regulators should focus on outputs, rewarding networks on the basis of the outputs they deliver and focusing on the aspects of service delivery that users and other stakeholders value.
- Care should be taken to avoid cross-subsidies.
- Regulators should recognise the importance of pilots and trials, and creative ways will need to be found to accommodate these in the regulatory framework, recognising that some innovations will not be successful.
- Since deployment will take place over many years, regulatory certainty is critical.
- Member States will vary in their priorities and emphases – there is unlikely to be a “one size fits all” approach that will suit all Member State requirements, or immediate benefits in EU-level benchmarking.

ANSWERS TO QUESTIONS

Q1. Do you agree that networks, transmission and distribution, are facing new challenges that will require significant innovation in the near future?

A1. We agree.

In fact, the whole industry faces new challenges to deliver the 20/20/20 obligations - network organisations, both transmission and distribution, as well as other stakeholders. The increased complexities for power systems of intermittent wind, embedded generation, electrification of transport

& heating and a significantly more active demand side cannot be underestimated; they represent new challenges (and opportunities) for networks, generators, suppliers and consumers.

Today's network organisations are responsible for managing an infrastructure which has not changed significantly for decades. Traditionally networks have resolved network constraints through network reinforcement. However, the need for significant volumes of highly flexible back-up generation to support the growth in intermittent (renewable) and/or inflexible (nuclear) generation, together with the expected electrification of heating & transport, means that network reinforcement alone may not be an economic option for meeting additional demands.

The introduction of sensors, two-way communications and increased levels of data will enable new and better planning and active management of networks. To take full advantage of the new opportunities that will be facilitated by 'smart' technology, networks will require significantly more innovative approaches to actively managing the power on their systems.

Q2. Do you agree with ERGEG's understanding of smart grid? If not, please specify why not.

A2. There are various projects which have tried to define what a smart grid is. A commonly accepted understanding of a smart grid must be fundamental to all EU-level smart grid projects, to support consistency and harmonisation.

We agree with ERGEG that a smart grid does not need to incorporate smart metering, and vice versa. Smart grids and smart meters, though often interconnected, are not dependent on each other. They co-exist and may/may not interact. They encompass both network activities and those activities that are or can best be delivered by the market.

We believe the depiction in Figure 2 implies the contrary, and also introduces problems of terminology. To prevent confusion we would prefer that where smart meters and smart grids are incorporated together, they are referred to as a 'smart power system'. We utilise this terminology in this response and strongly urge ERGEG to adopt this approach, to assist the clarity of future discussion of this subject.

We note the reference to future grids being necessary to reach the 2020 targets. In our view the smart grid should be seen as a key enabler, rather than a guarantee that the targets will be met. We would also note that the full contribution of smart grids is not likely to be realised within the next decade - hence they will be key contributors to the 2050 requirements.

We fully agree that a smart grid must be cost effective; it must deliver a more efficient system through active power management and lower line losses, with increased levels of quality and improved security of supply.

A smart power system (smart grids + smart meters) should integrate and help manage the actions of users of the value chain, facilitating the delivery of dynamic changes in the way power is produced and consumed in the future. Smart grid and smart power system developments must therefore allow the participation of all actors in a non-restrictive manner.

Q3. 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?

A3. As the consultation document recognises, the objective of reducing energy consumption can be achieved in a number of ways. We agree that the form of regulation applying to regulated network companies is a relevant consideration and it should be fundamentally reviewed to ensure it does not result in perverse incentives

We believe that correct regulatory policy and carefully constructed incentives can create a robust framework which sees energy consumption reduce without the need totally to decouple regulated company charging from the volume of energy supplied. At the same time regulation can be used to

support the overall objective e.g. by encouraging DNOs to incentivise management of energy by suppliers to effect load shifting.

In principle, it would seem more understandable for the *revenues* (as opposed to the profits) of network companies to be linked to energy consumption. Energy consumption has been considered under many regulatory regimes to be a potential cost driver for networks.

So long as revenue drivers and associated incentives are specified carefully, linking revenues to consumption should not in and of itself lead to excessive profits. In general, higher profits should only result if network companies are able to meet increased demand at a lower cost than that allowed by the regulator (which should in turn be set with reference to the cost to serve by an efficient network). Incentives may sometimes also be set to allow networks to make higher profit if earned e.g. from improved behaviour.

We would also note that in the recent electricity distribution price control review in Britain, there was a movement away from simple volume drivers to more focused revenue drivers (e.g. linked to number of new connections, which are more closely linked to cost than consumption levels).

Q4. Do you agree that the drivers that have been identified in the consultation document? If not, please offer your comments on the drivers, including the additional ones.

A4. We agree with ERGEG on the drivers identified in the consultation document.

The key driver for smart grids is the legislation related to the 20/20/20 targets and the priority attached to addressing climate change. This policy approach should at the same time improve security of supply and maintain competitive markets.

The changing generation mix of large intermittent wind power, relatively inflexible nuclear generation, smaller embedded generation and the increased demand loads from electrification of heat and power will create new challenges for the networks and their regulators. New solutions and opportunities for networks will arise in meeting these challenges, deriving in part from technological developments and the ability to leverage advances in modern communications. Solutions will be more focused on managing or mitigating network constraints through active network management and demand side management (DSM).

A smart power system should facilitate these more complex interactions, with aware and empowered users contributing to solutions rather than being hindered by barriers in the grid itself. Customer engagement will therefore be a crucial factor both in encouraging changes in behaviour (in response to consumption information resulting from smart meter deployment) and in embracing new technologies (e.g. distributed generation and electric vehicles).

Q5. Do you agree that a user-centric approach should be adopted when considering the deployment of smart grids?

A5. We strongly agree with ERGEG.

It is essential that the deployment of smart grids properly captures the requirements of both users and other stakeholders, and that the whole value chain benefits from participating in delivering smart power systems. While TSOs and DSOs will be responsible for much of the infrastructure investment, users of the system must be engaged as ultimately the expense of delivering a smart grid will be passed down to them. Equally importantly, users may have new and innovative approaches to delivering network solutions. For example aggregators or suppliers could manage customer demand through DSM and bundle new services and products to networks which aid network management and avoid expensive network reinforcement costs. Unless system users are engaged, new economic opportunities maybe missed.

Q6. How should energy suppliers and energy service companies act in the process of deploying smart grids solutions?

A6. As stakeholders, both must be actively involved in identifying new services as well as in the deployment of smart grids and smart power systems generally.

Energy generators and suppliers work either side of the transmission and distribution owners and have an interest in seeing economic and efficient solutions in the deployment of smart grids and in delivering the range of services identified by ERGEG. In general both generators and suppliers are concerned that the value of each unit of power they produce/provide is maximised. Suppliers will wish to see costs to customers reduced and the opportunity to create new customer propositions. Since suppliers are also responsible for both engaging and incentivising the customer to change behaviour, they will have the role of developing attractive energy services and product pricing.

Q7. Do you think that the current and future needs of network users have been properly identified in Section 3.3?

A7. ERGEG has correctly identified the major areas of need insofar as they can currently be perceived. However it is important to recognise the need for flexibility, over time and between Member States.

The requirements of traditional users of networks will change over time and the introduction of 'prosumers' who both produce and consume power will have new requirements that a smart power system will need to accommodate.

Also, Member States will vary in their priorities and emphases, and this must be respected. In this as in other areas, there is unlikely to be a "one size fits all" approach that will suit all Member State requirements and this has to be recognised at the outset.

Q8. Do you think that the main future network challenges and possible solutions have been identified in Sections 3.4 and 3.5 respectively? If not, please provide details of additional challenges/solutions.

A8. These sections are a helpful summary of the position. As networks migrate from passively managed systems to smart grids, challenges will arise. Networks will need to view suppliers and other stakeholders as partners in delivering solutions. New relationships between suppliers offering DSM and networks will need to be created and new frameworks both regulatory and commercial will be needed to support and facilitate such arrangements.

However it is clear too that the move to smart grids will also call for cultural changes within the networks if smart grid solutions are to be developed and innovative services brought to market. While it is not yet possible to predict the nature of these solutions and services, they will entail rapid technological change. Innovation will require networks to take more risk, but smart grids should not be an excuse to raise revenues beyond that which is appropriate to their investment needs and risk profile.

A particular challenge is that of ensuring that the process to deliver smart grids and smart power systems is open and transparent to all, while at the same time leaving network users able to conclude commercial arrangements with network companies and consumers which they can use to create competitive advantage and deliver innovative services to help customers manage their energy consumption.

Q9. 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 not, please provide details.

A9. We are not in a position to take a view on this, since 'conventional solutions' and past experience are not going to be able to respond to the challenges posed by new patterns of generation, electric vehicles etc.

In general smart grid solutions must be supported by a business case that is signed off by stakeholders, and the cost of the smart grid must be justified by the benefits it delivers to users. A smart grid must not be put in place just for the sake of it, and the benefits assumed for smart grids must be incremental to those assigned to the smart meter activity.

Q10. Would you add to or change the regulatory challenges set out in Section 3.6?

A10. We do not disagree with the challenges noted by ERGEG. Regulation will play an important part in delivering new regulatory frameworks that facilitate new commercial relationships between suppliers, networks and other parties.

Within these challenges, we would highlight the issue of demand side management / demand response. Suppliers maintain the customer relationship and are best placed to manage and aggregate customer DSM – this should continue. Suppliers can package this new proposition as a cost effective service which networks can then access. Individual customers likely to have limited enthusiasm for DSM products; however using suppliers to aggregate across portfolios will provide more value, more easily accessed by DNOs. However regulation must create the incentive for networks to contact suppliers and seek common solutions and approaches that are not possible today.

Similarly the impacts and opportunities of electric vehicles and heat pumps can be addressed by suppliers and networks finding solutions in how to manage increased demands to the satisfaction of those affected and the customer. Electrical load available for demand side management will vary by Member State, so any overarching regulation needs to recognise this and allow flexibility / variance.

In general, regulation must create a clear, consistent pathway to ensure the 20/20/20 targets are achieved, setting the smart grid targets and ensuring the targets are adhered to. It should permit flexibility in Member State solutions and approach and should encourage a culture of innovation whereby innovative networks and users are rewarded for identifying and delivering cost effective solutions. The regulatory framework will need to embrace the possibility of partnership arrangements and encourage joint funding.

Regulators should also recognise the importance of pilots and trials, which are essential precursors to wide-scale deployment. These represent major learning opportunities for all stakeholders, including regulators, and a range of trials are desirable. Creative ways should be found to accommodate these in the regulatory framework and to ensure that the knowledge obtained through smart grid trials and city pilots is shared and informs future deployments.

We would finally note that there are a number of other regulatory challenges often linked to smart meters but relevant to smart power systems generally. These include the introduction of time of use tariffs, noting particularly their impact on different customer groups.

Q11. Do you agree that regulators should focus on outputs (i.e. the benefits of smart grids) rather than inputs (i.e. the technical details)?

A11. We agree. Robust and consistent output measures are likely to lead to major long-term benefits to customers. Rewarding networks on the basis of the outputs they deliver should mean that networks will focus more directly on the aspects of service delivery that customers truly value. An

output-based regime will also make networks more accountable for the costs they incur, meaning customers can be more certain that they are getting value for money.

A major element in the long-term success of an output-based regime will be ensuring that networks are set stretching targets for the output measures that are developed. Only once there is confidence in the robustness of output measures should funding be linked to the attainment of such targets. Meaningful targets will also be key to building confidence in the robustness of output measures – critical to expanding the role of such measures in regulatory frameworks.

Thus we are supportive of the initial work by ERGEG on identifying potential performance indicators and look forward to working with ERGEG to further develop these.

Q12. 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?

A12. While not disagreeing with the effects and benefits presented by ERGEG, we would develop some of the points and highlight the positive features of smart grid deployment as follows:

- Enables and accelerates power system carbon reduction
- Increases a network's capacity to manage potentially diverse sets of new requirements
- Reduces the cost of transitioning to a low carbon energy system, increasing affordability for consumers
- Reduces infrastructure requirements, thereby reducing environmental impacts
- Reduces network losses and therefore lower carbon emissions
- Smooths demand – increases efficiency / less pollution (at peaks)
- Faster fault resolution (preventative monitoring / easier identification)
- Improved fault remediation e.g. power can be re-routed whilst fault fixed
- Better planning of future investment
- Integration of distributed generation
- Flexibility re: EU pursuing its low carbon opportunities

In the list above, those benefits which are most significant to the achievement of EU targets are clearly those involving carbon reduction / reducing environmental impacts.

Thinking more widely about smart power systems, we would add:

- Facilitates consumer engagement and power / incentives to act
- Gives consumers greater choice / control of consumption

From a regulatory point of view, we would expect these potential benefits to be quantified in the economic assessment of a smart grid and for the achievement of these benefits to be monitored against the economic case.

Q13. 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?

A13. There are two aspects to this question – the kind of performance indicators used for regulatory purposes and covered in the ERGEG consultation, and more direct measures associated with the practical deployment of smart grids.

As regards the latter, timely deployment will be central to the enabling of other services, many of which will be provided by commercial companies in a competitive environment. We therefore believe it is essential that network companies' performance is monitored against deliverables and dates in a published deployment timetable, since commercial companies will have planned on this basis.

In general, we believe that output measures selected should depend on the economic case and expected benefits in each instance. They should be driven by stakeholder requirements and the value they attach to each. It follows therefore that detailed output measures will not be the same across the EU – they will vary from Member State to Member State. Thus we do not see any immediate benefits for benchmarking at EU level.

However they are derived, performance measures should be capable of being achieved at reasonable cost, and once measures are set, performance should be monitored against them and reported upon.

Q14. 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?

A14. Yes. Typically the regulation of network companies is a balance between penalties and incentives i.e. when setting network price controls, there is a choice between fixing a maximum to be allowed and finding approaches which encourage particular outcomes by rewarding the regulated company.

In the case of smart grids, network companies need to be incentivised and reasonably funded to innovate. However it must be recognised that R&D is not risk free. There will be mistakes, those mistakes will have costs and assets may be stranded. The challenge is to achieve a balance such that the overall success rate on innovations is better than average i.e. more succeed and bring cost benefits than fail.

As discussed earlier, in order to manage the diverse set of new requirements prompted by smart power systems, integrated smart solutions will be required. The use of incentives may therefore be particularly appropriate in encouraging such innovative solutions, but there will also be user pressure.

On the question of output measures, we would refer to our comments on Q13 above.

Q15. Do you consider that existing standards or lack of standards represent a barrier to the deployment of smart grids?

A15. Insofar as smart grids are concerned, we consider this question is more readily answered by the network companies themselves. Standardisation in the area of smart meters is already being addressed via the Commission's mandate M/441 to the European Standards Organisations. It may be too early to start mandating standards for smart grids, at least until there is some clarity and consensus on the functionalities involved and their implications for communications requirements.

Q16. Do you think that other barriers to deployment than those mentioned in this paper can be already identified?

A16. Among the barriers to deployment, we would highlight the importance of the overall investment climate, cost of capital and cost of debt. These factors have to be recognised not only when considering price controls on network companies but also when assessing the readiness of other market players involved.

Since deployment will take place over many years, regulatory certainty is also critical, both over the period of deployment and beyond. Regulation needs to remain consistent for long enough to avoid imposing additional and inefficient costs (as participants try to keep up with changes) and to avoid deterring investors. There are also practical limitations on the deployment of new infrastructure, including planning, technical barriers and constraints in the supply chain.

To be successful, smart grids (and smart power systems) will call for cross sector co-operation. Reference has been made to the need to reach agreement at Member State level on the communications model or models to be accommodated, with potential implications for the communications sector. In addition, for electric vehicles, there is a need for an entire new

infrastructure to be developed and deployed. For the benefits of smart power systems to be fully realised, all of these aspects have to be considered, planned and implemented.

This again points to the need for user engagement and a user-centric approach. 'Users' in this context means not only those companies involved in planning and executing deployment of smart power systems; it extends to those applications and sectors who will make use of the smart power system and ultimately to end-user customers, since behavioural change on their part underpins many of the promised benefits.

Q17. Do you believe new smart grid technologies could create cross-subsidies between DSO and TSO network activities and other non-network activities?

A17. We welcome ERGEG drawing national regulators' attention to this important aspect. However we are not clear about whether DSO/TSO cross-subsidy is meant, or whether the issue concerns potential cross-subsidy between network and non-network activities.

In general we believe that to help avoid cross-subsidies, the roles and responsibilities of different market players - TSOs, DSOs, suppliers etc. – must be clearly understood in any smart grid deployment. Market players should be involved in discussions relating to overall design, and should contribute to the development of the overall project plan and its economic assessment. If this is done, there will be greater clarity about how the costs and benefits are spread across the value chain, and thus who is being remunerated for what. It should thus be easier to avoid the risk of cross-subsidy or double-counting when setting price controls.

Particular care will be necessary where a network company is also engaged in non-network activities.

Potential cross-subsidies as between TSOs and DSOs should be eliminated with the strengthened unbundling provisions of the Third Energy Package and the explicit duty placed on national regulators to ensure that there are no cross-subsidies between transmission, distribution and supply activities. . However, from a regulatory and accounting viewpoint, we believe it is essential that a distinction is also drawn within DSOs between their network businesses and their metering businesses. This will improve economic assessments relating to smart grids and smart meters and ensure price controls on distribution companies are robust.

Q18. What do you consider to be the regulatory priorities for electricity networks in relation to meeting the 2020 targets?

A18. We broadly agree with the issues identified in ERGEG's consultation document. In our view it is essential for the success of smart grid initiatives that national regulatory authorities focus urgently on reshaping existing forms of network regulation in order to accommodate smart grids, in particular where price controls cover several years. However the balance of priorities will differ from member state to member state and also between transmission and distribution.

In addition, there is the question of how far smart grids should be seen as strategic investments, whose costs can be anticipated in price controls, or whether funding is linked to deployment e.g. of smart meters. How far should the additional infrastructure costs of smart grids and smart meters be 'socialised' over all customers and over time? Should they be phased in some way, linked to their deployment and the expected benefits? The incentives of each approach and the differing customer impacts will need to be considered.

On the practical aspects associated with implementation, we would note that regulators may be able to draw on international experience and – in time – deployment in other Member States – to support regulatory approaches and understanding at their national level.