Mrs Fay Geitona
European Regulators' Group for Electricity and Gas
Council of European Energy Regulators ASBL
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1 March 2010

Dear Fay

Position Paper on Smart Grids

EDF Energy welcomes this timely consultation on a topic which is now on the agenda of many governments both across Europe and beyond.

EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. Our interests include nuclear, renewables, coal and gas-fired electricity generation, combined heat and power, electricity networks and energy supply to end users. We have over five million electricity and gas customer accounts in the UK, including both residential and business users.

The significant potential contribution expected from Smart Grids in helping to meet the challenges and opportunities of the new EU and national energy sector priorities in the coming decades are now recognised by a rising number of people, beyond energy specialists and professionals. We now have to make it happen. We believe that the work underway presently by ERGEG is an important step in this process.

However, we also have to remember that we are still in the early stages in the understanding and development of the Smart Grids concept. We can expect that new ideas and new products will emerge progressively. This means that our understanding of what and how Smart Grids can contribute will continue to evolve. That is why we have included in our detailed response a number of additional points which we hope may clarify the challenges that network companies will face.

For the same reasons, it is commonly accepted that, for Smart Grids to flourish and deliver their potential, important resources have to be put into R&D, innovation, skills and knowledge. Incentivising investment in these areas should be an important regulatory priority for the coming period.

One of the main benefits of Smart Grids will be the involvement of customers and the active role that even small consumers may have in helping manage the system on a collective basis. The key to achieving this will be encouraging changes in consumers' behaviour through the use of innovative tariffs and rewarding behaviour which will allow demand to be more effectively managed - this should be a key focus of any regulatory policy for Smart Grids. Smart Grids should initiate and encourage changes in consumer behaviour rather than simply accommodating those changes.

While fully supporting the importance given to consumers, we believe that the user-centric approach proposed in this document is too restrictive. For example, Smart Grids will be a key component of the low carbon economy and as such should be considered from a societal perspective in the framework of national and European energy policies.

In terms of the practicalities of network operation, network companies will have a number of new and significant challenges to manage all at a similar time: the decarbonisation of the heat and transport sectors resulting in a significant increase in electricity demand; the deployment of significant new, intermittent renewable generation leading to highly volatile electricity supply; and increasing levels of largely uncontrollable distributed generation on the system leading to the potential for reverse flow on lines and cables. New technologies will help in dealing with these challenges. For example once electric vehicles have become more widespread they may potentially be able to provide some practical embedded storage of energy for use in managing demand peaks. Innovative solutions like this, alongside more traditional measures such as price signals, smart metering, and direct control of customers' load will all be required, but t we have to recognise that unprecedented network investments will be needed to deal with this new and uncertain future. This should be another key regulatory priority.

The paper identifies numerous benefits which could potentially be delivered by Smart Grids, most of which we support and develop further in our response. However, we feel we must disagree with the potential benefits that could be delivered from reducing technical system losses. We explain in our detailed response why a 'smart investment policy' as set out in the consultation document may actually have adverse effects with regard to this issue.

Smart grids certainly have the potential to make a valuable contribution to meeting our sustainable development goals. However, if this is to be delivered, it is important to maintain and even reinforce the momentum that we have seen to date from appropriate governmental support schemes, notably in R&D and pilot innovative projects, and regulatory measures. However, we must also maintain a holistic approach to solving issues in the energy sector. All low carbon generation technologies are not equal in terms of costs and reliability; Smart Grids will not and cannot be the primary remedy to solve all the complex issues that energy policies have to address.

Our detailed response to the open questions is contained in the attachment to this letter.

We hope you find our comments useful. If you have any queries regarding this response, please contact my colleague Dave Openshaw on +44 7875 115093, or myself.

Yours sincerely

Denis Linford
Corporate Policy and Regulation Director

Attachment

Position Paper on Smart Grids

EDF Energy response

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?

Yes, we consider that networks are facing new challenges that will require significant innovation in the near future especially with regard to the growth in electricity consumption as Europe becomes less reliant on fossil fuels for heating and transport, and the need to support high levels of intermittent generation such as that from wind. Generation and demand will have to be more intelligently managed so as to limit the impact of new and very significant loads and power flows on transmissions and distribution systems

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

The summary is adequate in terms of what Smart Grids could deliver but we believe that it would be helpful to also summarise some of the characteristics of Smart Grids – for example:

a. Smart technologies to economically enhance the service quality, reliability, security and safety of the electricity supply system;
b. An enhanced information communications system to provide greater end-to-end visibility of the utilisation and condition of the network;
c. The economic connection of low/zero-carbon distributed generation and energy resources - from industrial/commercial to domestic scale;
d. Smart power flow, storage, voltage and fault level management strategies to permit the higher utilisation of distribution networks;
e. Smart management of flexible/responsive demand to improve load factor, minimise losses, and create additional capacity headroom. Key to this will be through the use of intermittent storage solutions such as presented by electric vehicles;
f. Strategies to minimise the peak network loading impact of electrical heating and transport solutions as we become less reliant on fossil fuels by leveraging embedded storage opportunities.

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?

As there is no direct or simple link between energy supplied and the cost incurred by network companies, we believe that the decoupling of allowed revenues and energy volumes should be recommended. This requirement will be more and more important as uncertainty on supplied volumes will rise as a consequence of the opposite effects of successful energy efficiency programs, and the development of heat pumps, EV and electronic appliances.
In GB, the decoupling will already be implemented in the next distribution network price control period, starting April 2010. We recommend that ERGEG studies Ofgem's decision document carefully and assesses the extent to which it embodies principles that could be of generic use for other jurisdictions.

For Suppliers, provided that additional volume is achieved through customer growth – for example as a result of offering a more attractive service than competitors (including home technologies) – then additional sales volumes are legitimate; indeed they provide the stimulus for product and service improvement and innovation.
It is overly simplistic to focus on the reduction of increases in capacity demand from commercial entities. The focus (as outlined in the document) of the regulatory system should be to ensure this is done in a managed way which will ensure that demand is met in the most effective and efficient manner.

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 believe that the list under 2.4 could be improved. For example, additional (and key) drivers not currently included are:

a. Load growth due to a move from fossil fuels to electricity fro heating(and cooling) and transport– and to some extent continued growth in digital appliances as technology develops and new innovative technological industries become prevalent;
b. The need to maximise utilisation levels and load factors for distribution networks so as to avoid (or minimise) cost-prohibitive reinforcement;
c. The need to be able to balance a system comprising very high contributions from intermittent sources of generation, often at times when there is less demand on the network and how this can be effectively managed for example through overnight charging of electric vehicles and embedded storage in such technologies;
d. The need to be able to provide adequate levels of short-term operating reserve, frequency response, etc. without undue recourse to spinning reserve from fossil fuelled plant;
e. To maximise the potential for smart distribution grids to contribute to system balancing, and other ancillary services, through intelligent manipulation of daily demand profiles and dispatch of distributed energy resources;
f. The need to integrate Distributed Energy Resources (DER),including DG and storage, into the design criteria for distribution networks, including embedded storage from EVs (to flex the demand profile – and possibly in future leverage Vehicle to Grid opportunities, linked to innovative tariffs and new customer service offering).

Section 3 – Smart Grids opportunities and regulatory challenges

5. Do you agree that a user-centric approach should be adopted when considering the deployment of Smart Grids?

A user-centric approach would need to be qualified by also considering the wider societal benefits – for example in delivering the government's energy strategy (i.e. in GB the UK Low Carbon Transition Plan and Renewable Energy Strategy). Smart grid deployment should also consider the potentially wider role of distribution networks in providing advanced infrastructure for EVs and ancillary services to TSOs where these will confer an environmental (lower carbon) and societal benefit as we move from pour reliance on fossil fuels.

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

Smart Grids will potentially allow energy suppliers and energy services companies to develop their portfolios in terms of:

a. Home area network services (demand management);
b. more flexible tariffs that will incentivise customers to optimise the utilisation of the whole electricity supply chain as well as responding to local network constraints; and
c. Demand-side management and generator dispatch contracts to both manage their balancing risk and market price volatility risk (i.e. with high levels of intermittent generation and the consequent limitations on accuracy of day-ahead and even 4-hour ahead forecasting accuracy);
d. The incorporation of new technologies with significant potential for embedded storage and 'sponge battery' implementation to allow more effective demand and supply optimisation to take place. This will allow even higher utilisation of existing infrastructure by unlocking capacity and controlling daily demand cycles.

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

Broadly – yes. However, we would like to comment on 3.3.1 "services needed by generators and prosumers" and also stress the importance of smart metering as an enabler of expected smart grid benefits.

- Services needed by generators: whilst we agree that generation network users will require timely connection and grid access, we disagree with the need for tailored access products. Access is a route to market and should be provided to all generation on a level playing field (in particular in GB where the system is designed to user capacity). Until developments in the Regulatory environment have led to changes in the way transmission systems are built and operated access should also be provided on a capacity basis.

- Smart metering: it should be emphasised that only by deploying smart metering (and communication) real time systems, based on a comprehensive and 'use case' justified functional specification, will all of these benefits be delivered. AMM rather than AMR will need to be the basis of the metering system with unhindered access to, and interaction with, smart metering information by DSOs as well as Suppliers (but with adequate provisions for data privacy and security, and cyber security). Home area network services and smart appliances will also play a major role in helping residential customers to become effective 'prosumers'. Key to this will be ensuring that as technologies become more widespread safe and dedicated circuits are used for new technologies such as electric vehicles.

  Smart metering functionality to support Smart Grids should include:

a. Demand profile modelling at a level of super-granularity (i.e. down to individual LV network sections and spurs);
b. Voltage profile modelling at a similar level;
c. The early identification of 'load creep' and of potentially overloaded branches (for example LV branches likely to give rise to LV fuse operations during a cold snap);
d. Evaluation of capacity headroom to enable the effect of planned new connections or the impact of prospective demand augmentations to be assessed;

e. 4-quadrant metering enabling real/reactive import/export profiles and overall power factor to be individually monitored (essential with increasing levels of Distributed Generation and non-linear loads - including CFLs);

f. The assessment of 'latent' demand due to small (auto)-generators (i.e. hidden demand that will present itself to the network with the DG disconnected – e.g. upon re-energisation of a network following an interruption);

g. Two-way communications to enable advance notifications of potential network constraints and arranged shutdowns and to support meter status, alarm and alert functions;

h. Consumer appliance load switching (for example for "off peak" or "Time Of Use" controlled appliances);

i. Optional automatic cut-off to prevent excessive demand;

j. Mapping of smart meter data to the LV network (i.e. 'network connectivity' to enable upstream modelling of power flows);

k. Power quality data (i.e. voltage waveform distortions) – of increasing relevance with increasing levels of DG, heat pumps and EV charging systems;

l. Time-stamped interruption / restoration information enabling accurate assessment and reporting of Quality of Supply performance (and 'rogue circuit' identification) – and, potentially, automation of Guaranteed Standards Scheme payments;

m. Detection of serious under-voltage and dangerous over-voltage conditions (the former typically associated with unbalanced or overloaded networks, AVC malfunctions, and open circuit faults; the latter typically associated with 'lost' neutrals or Automatic Voltage Control malfunctions) – including an optional automatic disconnection function to prevent damage to appliances;

n. Power outage detection (either through alarm signals or via meter polling) – of particular value in managing system emergencies with characteristic 'masked' downstream faults.

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 would like to make the following remarks:

3.4.1 As discussed above, tailored access products and network access tariffs for intermittent generation might follow from changes in the way transmission systems are designed and built. Until this is properly understood a move away from the existing capacity based access products and charging would be inappropriate.

3.5.2 Regarding losses, we do not believe that they will confer a significant carbon impact once electricity production becomes effectively decarbonised. Moreover, we believe that the claimed reduction of losses is unrealistic, or at least needs to be put in context. Smart metering could undoubtedly have a positive effect on reducing commercial losses. However, the case is the opposite for technical losses. Smart Grids will result in higher electricity demand. They will enable higher levels of network utilisation and higher load factors (for example, by smoothing daily demand troughs) as the current reliance on fossil fuels for heating and transport dissipates and innovative new technologies become more prevalent. Hence technical losses will be higher than if we simply reinforced the networks (not only variable losses, but also fixed losses, as older high loss transformers would not be retained in service and not replaced with modern low loss designs). The Smart Grids objective will be to optimise losses as part of maximising the overall economic (including cost of carbon footprint) performance of the network.

Moreover, the list under 3.4 could also legitimately include:

Planning for higher levels of DG at all voltage levels (in the case of GB, including EHV connected Crown Estate Round 1 and 2 offshore wind farms of up to 350MW capacity) through HV/MV connected onshore wind farms, waste incineration, landfill gas, biogas, sewage gas, biomass, energy crop and CHP plants, down to MV/LV connected community energy schemes and micro-generation.

Planning for demand growth by establishing load management policies which will include:

- Limiting demand take at times of high network loading - initially through time-control of EV charging or real-time controls to encourage behaviour which will allow even higher utilisation of existing infrastructure by unlocking capacity and controlling daily demand cycles);
- Encouraging optimum charging profiles for electrical technologies by promoting intelligent systems (which for example take account of residual charge and anticipated duty);
- Encouraging the adoption of heat storage in conjunction with electrical heating solutions (for example through lower connection charges reflecting avoided upstream reinforcement) which will permit time of day or real time controls of heating load;
- Monitoring of smart meter information to highlight emerging network loading or voltage issues.

Deploying new active network management technologies which will permit deeper penetrations of DG while avoiding the need for extensive network reinforcement, for example the selective application of:

- Enhanced Automatic Voltage Control (AVC);
- Dynamic line ratings (recognising in particular the synergy between wind farm output and the effect of air cooling on overhead line conductor ratings);
- Active generator constraint systems to provide economically viable connections (recognising the relatively low likelihood of conflict arising from intermittent wind generation maximum export occurring during times of minimum demand);
- Inter-tripping to control fault currents to levels consistent with existing plant and equipment ratings in order to mitigate the impact of higher fault levels due to induction machines (motors and generators);
- Superconducting devices – including fault current limiters to permit higher levels of penetration of DG – particularly in urban areas where fault levels may already be approaching switchgear short-time ratings, and especially synchronous generators which will impact on circuit breaker fault-breaking as well as fault-making duty;
- Lower impedance distribution transformers with on-load tapchangers and higher speed LV protection (and/or) in-line voltage regulators to counter the voltage rise effects of DG on LV distributors;
- Power / reactive flow control through use of Static VAR Compensators (SVCs) and phase-shifting transformers to control and optimise power flows on HV interconnected networks;
- Series compensation of long AC transmission systems to reduce reactive flows and increase real power capacity;
- Use of Voltage Source Converter (VSC) technology-based DC systems to supplement existing AC transmission systems and, through multi-point applications, the economic connection of offshore wind farms to the transmission system;

- Storage / power electronic conversion technologies - including battery, super capacitor, Superconducting Magnetic Energy Storage (SMES), Flywheel Energy Storage (FES), Compressed Air Energy Storage (CAES);
- Advanced / adaptive protection systems to accommodate higher levels of DG, maximising fault ride-through capability to maintain adequate system angular stability while ensuring reliable in-zone fault clearance;
- Self-healing networks (real-time network optimisation) using autonomous control systems which will respond, independently from the central SCADA system, to step changes in power flows, unplanned outages and active condition monitoring alarms - and redirect power flows as necessary to retain system integrity.

Contracting for demand-side services - to alleviate network constraints, in particular dispatch of responsive demand and standby generation including through:

- System 'nodal' distribution use-of-system price signals (i.e. prices set to reflect constraints and marginal reinforcement costs at specific network nodes – such as at a distribution substation);
- Direct control of demand, curtailment / constraining-on of generation, and dispatch of embedded storage;
- Bilateral demand management contracts (supported by appropriate communications systems as appropriate to the speed of response required).

Acting as Technical Aggregator - taking actions as necessary to maintain network efficiency and security, and manage network constraints, including:

- Optimising network configuration to minimise electrical losses (but please see our comments regarding optimising technical losses under 1.2 above);
- Maintaining plant and equipment loadings within thermal ratings, including appropriate application of continuous, emergency and dynamic ratings as appropriate (noting that as load factors improve, cyclic ratings might need to be reviewed);
- Maintaining network design security standards
- Direct control of demand (i.e. through radio tele-switching or similar) as necessary (where Suppliers' tariff price signals may be insufficient or possibly in conflict with local network constraints).

Playing a leading role in enabling electric vehicles - facilitating trials and (potentially) financially 'pump-priming' a national electric vehicle charging infrastructure – whilst recognising that differing national systems may mean that different solutions will present the optimum outputs.

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.

Over the next few years there will be a need to front-load trials and deployments of Smarts Grids solutions involving prototype (but not necessarily yet fully commercialised) technologies - while continuing to research and develop new technologies. This will result in incremental costs over and above investments using conventional technologies to address more immediate network reinforcement and asset replacement drivers.
However, while the costs of deploying Smart Grids have yet to be fully understood, studies have already shown that in the longer term Smart Grids solutions could have the ability to very significantly reduce the potential costs of supporting the expected growth in low carbon heat and transport alternatives, in particular heat pumps and electric vehicles.

10. Would you add to or change the regulatory challenges set out in Section 3.6? Section 4 – Priorities for Regulation

Please see our answers under Section 4 below.

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)?

In the longer term output measures will be appropriate. However, in the shorter term the net impact of innovative (unproven) technological and commercial initiatives will be uncertain. A complete focus on output measures with inadequate recognition of the risks associated with innovation might lead to risk-aversion. The consequence could be to delay innovation (please see also answer to question 13).

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?

Important additional benefits include:

a. Improved grid stability by leveraging the benefits of flexible demand to provide short-term operating reserve and frequency response in order to cater for short term demand and especially generation forecast errors and unexpected losses of generation. Performance indicators would be reduced requirements for spinning reserve provided by fossil fuelled plant and hence reduced costs (including carbon costs) of system residual balancing;
   These benefits should have an impact on market price volatility through closer real-time matching of demand against intermittent renewable generation. Nevertheless, price volatility is the complex outcome of several factors, and we do not believe that we will be able to determine what contribution Smart Grids will have on an overall market price volatility indicator;
b. Accommodation of significant growth in electricity demand as a result of policies to decarbonise (i.e. by electrification of) heat and transport while avoiding major investment in distribution and transmission systems. Smart grids will control the charging cycles of electric heating (and cooling) and transport systems whilst, leveraging the benefits of embedded storage (batteries and hot water storage respectively) to minimise the impact on daily peak electricity demands and hence the need for reinforcement. Performance indicators would include distribution network utilisation factors and load factors to control daily demand cycles;
c. Intelligent voltage control to accommodate higher levels of Distributed Energy Resources, and electric heating (and cooling) and transport systems, exploiting the acceptable voltage bandwidth of LV networks (based on appliance compatibility limits) to minimise network reinforcement. As with the above, the benefit would be avoided distribution network investment; performance indicators would include utilisation of voltage bandwidth and avoidance of voltage transgressions;
d. Smart distribution grids will be able to make an important contribution to residual balancing of the transmission system (especially with a largely islanded transmissions system such as GB). For example DSOs could provide balancing support as an ancillary service, controlling import (or export) levels at the

transmission-distribution interface. As with b above, a performance indicator would be avoidance of spinning reserve provided by fossil fuelled plant and hence reduced costs of system residual balancing;

e. As has been discussed earlier in our responses, changes to existing access products and capacity based charging in GB should not be contemplated prior to the development of new design standards and network build. Access acts as a route to market and provision of access to all generators on a non-discriminatory basis along with stable and transparent charges is crucial to investor certainty. Until Smart Grids are a reality there should be no implementation of tailored access and charging, including Time of Use tariffs, to generators.

f. Involvement of all stakeholders will be needed to shape the future of Smart Grids. From end users to governmental agencies, generators to energy services companies, there is a large spectrum of stakeholders. They will be all required to set up the vision of the electrical system. The way how the representation is organised, the coordination is structured and the cooperation encouraged could be assessed.

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?

The performance indicators suggested in our response to question 12 above, and those included in Table 1 of section 4.1, should provide the basis of a future output measure regime. However, it is early days in the evolution of Smart Grids and if innovation is to be encouraged then it will be important to construct an interim output regime that rewards well managed research, development and deployment, and well-managed risk. Please see our response to question 14 below;

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?

A valid (and valuable) output of RD&DD, and trials of innovative technologies and commercial instruments, is learning; this includes learning from failure. During the RD&DD phases of the evolutionary path of innovative technologies and commercial instruments, it will be important to construct outputs that reward well managed projects. Projects should therefore clearly state their learning objectives - as well as costs and delivery timescales - to enable an objective ex-post review of the project. The extent to which the project had achieved its objective in terms of delivered learning - and the extent to which costs, milestones, and risks had been expertly controlled - should be the basis of assessing the quality of the output. The quality of the output would determine the extent to which DSOs could recover their project costs, including being rewarded to a level that exceeded their project costs for a successfully managed project.

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

Existing standards (including ICT standards) provide a valuable foundation for developing the necessary open ‘Smart Grids’ standards to ensure interoperability and integration (for example: ‘interoperability’ of smart meters, home area networks (HAN) and smart appliances; and ‘integration’ of smart meter data with network power flow data). Rather than developing new standards, the focus must be on identifying, and addressing, any barriers to interoperability and integration that existing standards might give rise to. This will be of particular importance in designing smart meter and communications systems – and ensuring Smart Grids compatibility.

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

It is important to understand that 'Smart Grids' have the potential to beneficially impact the whole of the physical electricity supply chain – from generation, transmission, distribution, metering, and including the home area network. In that context, albeit not a barrier, the liberalisation (or debundling) of the market, and the resultant multiplicity of market players, do lead to co-ordination challenges and, potentially, suboptimal incentivisation. For example, with high levels of intermittent generation, system balancing will become significantly more complex (and risky) both in terms of trading positions and residual balancing risk.
Market players will quite reasonably seek to maximise their positions and minimise their individual risks. However, this might not always minimise the overall system risk and hence costs to customers. For example, the unilateral actions of a Supplier, Distributed Generator, Virtual Power Plant Operator, or Aggregator, might give rise to either transmission or distribution constraints. Conversely, unilateral actions by a DSO (for example dispatching demand reduction or storage) to balance the distribution network could affect Suppliers' balancing positions. It will be important to review existing regulatory and commercial frameworks to minimise any adverse impacts of a fully liberalised market in terms of achieving a secure, affordable and low (and ultimately zero) carbon electricity system.

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

The risk of cross-subsidy needs to be assessed in the round; in particular if an element of cross-subsidy results from Smart Grids actions and a more complex market, this might be an acceptable consequence of achieving the wider societal benefits of a secure, affordable and low carbon electricity system. A controlled level of cross-subsidisation through socialisation of some costs (for example renewable generation and heat incentives) might be appropriate.

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

Over the period to 2020, the regulatory priorities for electricity (transmission and distribution) networks should include:

a. Providing the appropriate investment climate for new low carbon and renewable generation;

b. Ensuring the regulatory framework delivers investment in the transmission and distribution networks to allow for the timely connection of new low carbon and renewable generation;

c. Delivering an appropriate review of the security standards to deliver efficient transmission network investment;

d. Providing effective incentives for innovation, in terms both of direct incentives (as discussed under 14 above) and regulatory returns that properly reflect higher levels of risk; recognising the workforce renewal and skills challenge, in terms both of replacing an aging workforce and the need to assimilate new technical and commercial skills; ensuring that unbundled markets do not create barriers to Smart

Grids and the societal benefits they will deliver. For example, smart metering (including communications system) strategies must be fully compatible with the delivery of Smart Grids objectives, irrespective of the chosen ownership / roll-out model.

e. Ensuring that all regulation encourages innovation in relation to the technological and societal management of consumer’s behaviour in a way which encourages behaviour which will allow even higher utilisation of existing infrastructure by unlocking capacity and controlling daily demand cycles.

EDF Energy
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