



**Response by GE to Ofgem's Consultation:  
Regulating Energy Networks for the Future: RPI-X@20  
April 2010**

## **Introduction**

GE is a leading supplier of power generation and energy delivery technologies and welcomes the opportunity to contribute to this consultation exercise. We provide a broad array of solutions for traditionally fuelled plants as well as those driven by renewable resources.

In the UK GE Energy's installed technology meets 18% of UK energy needs. We are also a smart grid solutions provider to the electrical distribution industry supplying Distribution Management Systems (DMS) to 13 out of the 14 Distribution Network Operators (DNOs).

Deploying smart grid technology will be essential if the UK is to meet its energy targets. The UK's electricity networks will require significant levels of investment and innovation in coming years to adapt to growing demand. Missing the opportunity to digitalise the networks at the same time would be a lost opportunity.

Europe is an important centre of innovation, research and development for GE with our Global Research Centre located in Munich, Germany. Meanwhile in the UK we recently opened a Smart Grid Demonstration Centre in order to demonstrate how the smart grid will be crucial in meeting the UK's energy challenges.

## **Summary**

Overall GE welcomes Ofgem's approach to a complex but critical aspect of the regulatory regime, and for placing the theme of sustainability at its heart. We support the need for a reassessment of the regulatory framework at this time given the shift in the policy framework, however we recognize it is important to build on the successes of the regulatory framework that has served the industry in the past.

In this context we believe Ofgem is right to argue that the focus must be to move from achieving efficiency gains towards facilitating delivery of environmental targets. This will entail significant network renewal over timescales that are much longer than the periodic regulatory control period and the role of the network operator is set to change as local markets develop.

This paper summarises some of the key headline points, particularly relating to some of the themes developed in response to chapter 4, which addresses *incentives required for long term delivery*. Our main points are as follows:

- We are at an inflection point in the evolution of the electricity industry, which will require new ways of doing things. However, the ability of today's grids to adapt to new forms of generation and demand is based on an outdated industry model.
- Smart grids will involve greater degrees of automation, communication technologies and information flows. This technology is available today and can be integrated cost-effectively, quickly and reliably to maximise the potential of the UK's existing infrastructure.
- Use of smart grids to manage future energy demand will require strong integration and co-ordination between various actors. It will be important to foster a climate of innovation in which the pace of change can be significantly enhanced by new relationships and better customer engagement.



### **Meeting challenges of future network regulation**

It is widely understood that to develop smart grids will require changing the financing model of electricity distribution. The ability of today's grids to adapt to new forms of generation and demand is based on a process of standardisation that occurred under an outdated industry model where practice mainly focused on reducing costs.

GE recognizes that Network Operators have to address a wider set of demands which balances their ability to earn the revenues needed to maintain and improve network reliability, achieving environmental issues to support Government low carbon initiatives and the need for service and reliability investments to the networks.

Incentives from regulators to Network Operators will have to move from rewarding efficiency improvements to sustainability. However the regulatory framework and business models need to recognise the unique nature and characteristics of the fragmented supply chain present in the UK.

Regulation will be needed to promote deployment of smart technologies by incentivising the full energy supply chain to implement and benefit from CO2 reductions. The regulator can create the right network incentives to attract investors by moving towards an approach that internalises (i.e. attaches costs to) social and environmental impacts rather than purely customer minutes lost (CMLs). These will invariably include:

- Ongoing use of electricity losses incentives
- Greater provision of information to generators of low carbon and energy saving developments
- Promotion of demand-side management or distributed generation as a means of addressing capacity constraints
- Innovation for trials of low carbon technologies and sharing of results
- Reporting on sustainability and carbon footprint

Currently there is considerable uncertainty about how networks, and the wider energy sector, should develop in the long-term in order to facilitate the meeting of government environmental targets. However this should not prevent the Regulator from providing a clear sense of direction on what regulatory framework is required to drive deployment of sustainable technologies in the shorter term.

### **Technologies to manage future variability and intermittency**

GE views the deployment of smart grid technologies as an incremental process of applying information and communications technologies to the electricity system, enabling more dynamic 'real-time' flows of information on the network and more interaction between suppliers and consumers.

Smart grid brings with it a greater degree of complexity involving automation, communication technologies and information flows. However these technologies are available today and GE capability enables them to be integrated cost-effectively, quickly and reliably to enhance the existing infrastructure.

Smart grid technologies will enable the optimisation and use of higher percentages of renewable power and prepare the grid to integrate widespread distributed generation. Around 70% of UK electricity is currently generated from gas and coal; by 2020 renewable generation sources are anticipated to expand to around 20% while gas will continue to play a prominent role in our generation. In the longer term shifting transport and heat onto the electricity system could mean up to a doubling in electricity demand by 2050.



To date, demand for electricity has varied in a fairly regular and predictable way over the year and over the time of day. The move to low carbon generation technologies and new low carbon consumer appliances (e.g. heat pumps, electric vehicles etc) is anticipated to introduce a set of new challenges in both generation and demand. As a result we anticipate a need for more proactive integration between retail and network operations and the need for end-to-end solutions.

### **Taking an integrated approach**

Use of smart grids to manage future energy demand will require strong integration and co-ordination between generators, network companies and energy suppliers as well as with the wider supply chain, ICT providers and Government agencies tasked with co-coordinating roll-out.

As centres of energy demand, investment and innovation, cities are prime candidates for smart grid investment. The majority of greenhouse gas emissions are attributable to consumption and energy use in large towns and cities. In the UK, around 80 per cent of the population already lives in urban areas.

GE urges a commitment to support city-scale deployments of smart grid to validate benefits. In the Middle East GE is supporting the GE-Masdar 'Smart' Appliances Program, which is the world's first carbon neutral zero waste city. The programme covers 40,000 inhabitants and \$24bn investment over 8 years. From 2010 it will be the first to measure and transmit real-time power consumption data to manage peak energy load, monitor energy consumption behaviour, through the facilitation of two-way communication and customised appliance responses.

In the US, GE is also participating in a 'Smart City' project in Miami. Smart meters have been installed into over 1 million households combined with a major deployment of concentrated and distributed solar power and 12 hi-tech digital substations.

### **Encouraging innovation**

In December 2009, the Department for Energy and Climate Change (DECC) published a report entitled, *Smarter Grids: The Opportunity*, which highlighted the importance to the national economy of exploiting the benefits of technology leadership.

The new shape of innovation requires a multi-disciplinary approach and arises from the intersection of new relationships, fields and spheres of activity. To maintain Britain's competitiveness in the energy supply sector while at the same time create a climate for innovation, GE recommends a parallel process to existing schemes for smart grid funding that de-couples applications from traditional routes that are exclusively tied to DNOs.

At the same time it is important to stress that traditional relationships continue to work well, however this approach will reinforce risk-taking and longer-term investment by the third parties. By creating the opportunity for third parties to develop applications in their own right Ofgem will recognise the importance that fostering a climate of innovation will play in meeting the UK's energy challenges.



### **Encouraging and enabling consumer engagement**

Consumer engagement lies at the heart of the roll out of smart technologies. It should become part of wider efforts to encourage customers to think more about reducing carbon and saving energy.

Energy reducing technology and the ability to display information to consumers also represents a major new source of innovation and is a key enabler of greater competition. It allows suppliers to compete on their offerings or better understand how they can support particular areas of the supply segment such as vulnerable customers.

As a part of this, both DECC and Ofgem should consider support for an information and awareness raising campaign. This could play an important role in promoting smarter grid technologies by linking the messaging on smart grid to the overall benefits to the UK economy of green R&D and jobs.

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