

**Electricity distribution license holders**  
**Electricity transmission license holders**  
**Users of electricity distribution networks**  
**All parties engaged in the development of smart grids**

Date: 21 June 2013

Dear Colleague,

## The Smart Grids Forum – Second Annual Report

As we firm up plans for the Smart Grid Forum's (SGF) third year, we wanted to take the opportunity to look back on what it has delivered in the past year. A lot has been achieved, thanks to continued collaboration and contribution from across the industry. This Annual Report offers a few highlights of the progress made by the SGF in its second year, from developing a ground breaking analytical model to creating consensus around opportunities for regulatory change. It also sets out the direction of travel for the year ahead.

### Summary

- **Ground-breaking smart grid evaluation model, Transform, completed to support the RIIO ED1 process**
- **Co-operation between Government, Ofgem and industry continues to deliver real benefits**
- **Regulatory and commercial impacts of smart grids being addressed by all stakeholders**
- **New work planned to refresh the GB Smart Grid Vision and Routemap and to demonstrate the technical viability of a smart distribution network in 2030**

### Background to the Smart Grids Forum

There is a broad consensus that the transition to a low carbon energy system will have significant impacts on our electricity distribution networks but also brings opportunities. The electrification of heat and transport and the integration of intermittent generation will bring many new challenges, particularly for the Distribution Network Operators (DNOs) as they work to increase capacity and accommodate new technologies. But with these challenges come opportunities to do things differently and to support the economy. For example, by adopting more intelligent monitoring and control into distribution networks and engaging the demand side (i.e. elements of a smart grid), industry can meet these challenges at lower cost than more conventional solutions and in doing so support new jobs in the 'smart grid' sector and create export opportunities.

Government and Ofgem are supporting innovation across the network companies so they are able to play a full role in achieving our low carbon targets at value for money to customers. In particular, innovation is a central element of Ofgem's RIIO<sup>1</sup> philosophy. In addition to incentives in the price control settlements, Ofgem is encouraging innovation in the DNOs through the Innovation Funding Incentive and the Low Carbon Networks Fund (LCN Fund). DECC's Low Carbon Investment Fund provided early funding for innovative projects and its rollout of smart meters across Great Britain by 2020 will provide a critical platform for the development of a smart grid by providing better

<sup>1</sup> <http://www.ofgem.gov.uk/Networks/rpix20/ConsultDocs/Documents1/RIIO%20handbook.pdf>

information and improving communication between consumers, electricity suppliers and network companies.

The SGF is another important vehicle through which Ofgem and DECC are supporting industry on smart grid issues. Established in April 2011, the SGF brings together expertise from across the network, supplier, generator, customer and manufacturer communities to provide strategic input to help shape Ofgem's and DECC's policy making and leadership in this area. The SGF is also helping network companies address future network challenges, to ensure that whole system benefits are considered in this work, that commercial and regulatory aspects are addressed in a timely way, and to provide drive and direction for the development of smart grids.

More details about the SGF can be found on our [webpages](#) including a full list of [members](#).

### The Smart Grid Forum – the second year

It was recognised from the outset of Year 2 that the key theme for the year ahead would be preparation for the next electricity distribution price control ("RIIO ED1"). As such, this was the central focus of the second year work programme. Real progress has been made by all the work streams and this is briefly reported here (All meeting notes are available on our [web pages](#)).

#### *Work Stream 1 – Assumptions and scenarios*

The purpose of this work stream has been to develop and maintain shared assumptions and scenarios of the main drivers of the need for additional distribution network capacity. It involves setting out government analysis of the implications of its low carbon policies, consistent with meeting the government's [Carbon Plan](#).

Building on the outputs of Year 1, this work stream updated analysis of the expected uptake of electric vehicles, heat pumps and distributed generation. This work provided vital inputs to the Work Stream 3 Transform model (see Work Stream 3 below). Work Stream 1 also ensured that the expertise of SGF members was harnessed to inform the development of DECC's policy document, "The Future of Heating: meeting the challenge"<sup>2</sup>.

#### *Work Stream 2 – Smart grid evaluation framework*

At the end of Year 1, this work stream successfully completed its work to develop an evaluation framework that can assess, at high level, alternative network development options. This work was adopted by Work Stream 3 and provided the foundation for the Transform model. Work Stream 2 has now been closed down.

#### *Work Stream 3 – Developing networks for low carbon*

The purpose of this work stream has been to create a ground breaking model ("Transform") of the costs and benefits of smart developments of the GB distribution system, incorporating the fundamental economic assessment approaches developed in Work Stream 2 and using the low carbon projections for GB from Work Stream 1. Building on Phase 1 of this work, which was completed in Year 1<sup>3</sup>, Phase 2 focused on developing the model<sup>4</sup>. It found that the impact of

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<sup>2</sup> <https://www.gov.uk/government/publications/the-future-of-heating-meeting-the-challenge>

<sup>3</sup> This undertook an initial evaluation of the networks' response to the challenges of a decarbonized energy system. It was published in November 2011 (available [here](#)).

<sup>4</sup> EA Technology Ltd was the main contractor for this work, but included sophisticated contributions from Element Energy and GN Noble Denton.

decarbonisation on GB electricity distribution networks is likely to be very significant, especially beyond 2020. Analysis confirms that smart solutions are more cost effective than traditional solutions, with the optimum response being a blend of smart and traditional network solutions. Furthermore, customers should benefit from new services delivered on the back of smarter networks. The methodology and findings were published in August 2012 in the report titled “Assessing the Impact of Low Carbon Technologies on Great Britain’s Power Distribution Network” (available on our [web page](#)). A public dissemination event on the findings of the modelling, attracting about 60 delegates, was held in November 2012.

Phase 3 of the work has recently been completed and focused on refining Transform and splitting the model into 14 licence areas for GB so that it can be used to inform DNOs’ RIIO ED1 business plan submissions. The outputs of this work are now published on the [SGF website](#). The broad conclusion remains that a mix of smart and traditional solutions is still the optimum long term development, offering significant savings in the order of 25-30 per cent of total investment costs to 2050. The model shows that while the bulk of network investment needed to accommodate low carbon technologies arises in RIIO ED2, there are substantial challenges for the DNOs to address in RIIO ED1. For example, the majority of the new technologies that will be deployed in RIIO ED2 will make their first appearance on networks in RIIO ED1, requiring close attention to innovation, capacity building and risk management. Phase 3 also recognises that Transform is a useful resource for the wider industry to decide on appropriate smart strategies and further work is planned to maintain the model (see below).

#### *Work Stream 4 – Closing doors*

This work stream has the role of highlighting the potential impact that near-term policy development and decisions could have on our longer term goals. In Year 2 it engaged with SGF Work Stream 3 (Phase 2 Report) for potential 'closing door' issues, and flagged up issues with regard to enabling activities needed in RIIO ED1 in order to realise the targets of the Fourth Carbon Budget. It also assessed the SGF Work Stream 6 report on commercial and regulatory barriers for 'closing door' issues. This workstream also reviewed government's key publications relating to electricity generation (in particular, the Draft Energy Bill setting out Electricity Market Reform proposals and the Gas Strategy). During the year the membership of this workstream was strengthened to include supply chain representation covering large and small interested parties.

#### *Work Stream 5 – Ways of working*

The most significant investment in smart grid solutions in GB is through Ofgem’s LCN Fund. This provides funding of up to £500m between 2010 and 2015. LCN Fund projects will be a significant source of information and learning. The DNOs are required, as a condition of receiving LCN funding, to proactively disseminate the knowledge gained.

Throughout the last year, the Energy Networks Association (ENA) has been working on the development of a website to link all LCN Fund projects as well as those funded by Ofgem’s Innovation Funding Incentive. This work is now complete and will be formally launched on 25 June this year. It will provide a valuable new resource that will allow improved access to knowledge gained from DNOs’ innovation activities. In addition, Smart Grids GB (SGGB) has also been investing in the development of its website to provide better information sharing both for its members and the public domain. The new website was launched on 17 January 2013. However, the plan to link these and other resources together under a common web portal has not yet been realised. This will be a priority over the next year (see below).

### *Work Stream 6 – Overcoming commercial and regulatory barriers*

This work stream brought together stakeholders to investigate any potential commercial and regulatory challenges to implementing smart grid solutions (including demand side response). The work stream published its first report in August 2012 and this was used by Ofgem to inform the RIIO-ED1 policy development. The first report concluded that there are few barriers to the deployment of smart grid solutions in RIIO-ED1. Many of those identified could be addressed by industry through existing governance arrangements for engineering recommendations and charging methodologies. The report also highlighted that there may be a lack of commercial mechanisms to enable parties to maximise the use of smart grid solutions.

### **Smart Grid Forum – Year 3 Programme**

Following a process open to all SGF members to identify key priorities for the year ahead, the SGF agreed to the following work programme:

- Development of a **Smart Grid Vision and Routemap**<sup>5</sup> which will refresh the shared objectives for a GB smart grid and provide a framework to track progress in overcoming the challenges to smart grid deployment;
- An assessment of the options for the development of smart grids, particularly in terms of **how customers will engage with smart grids**, and as a result of this, the necessary roles of industry parties and the relationships between them;
- Investigation to confirm **how a future smart distribution network will operate safely and securely** in order to provide evidence and build confidence that the risk of whole system failure will not increase, that power flow and voltage can be properly controlled and that customers will get the services they require in a cost efficient and safe way.

In addition, the SGF will continue to:

- Update and maintain shared assumptions and scenarios of the rollout of low carbon technologies in support the Government's energy goals;
- Provide governance for the Transform model, including any necessary ongoing maintenance and incorporation of any new data from Workstream 1;
- Identify 'closing door' issues;
- Link the various smart grid web resources (including the new ENA LCN Fund website) together under a common web portal; and
- Work in co-operation with other industry groups such as ENSG, SGGB, and the Institution of Engineering and Technology.<sup>6</sup>

We welcome your feedback and look forward to working with you over the coming year.

Yours faithfully,

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Distribution



ofgem  
Making a positive difference  
for energy consumers

**Sandy Sheard**

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Department  
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<sup>5</sup> Building on the Electricity Networks Strategy Group Smart Grid Vision, published in 2009

<sup>6</sup> Electricity Networks Strategy Group; Smart Grids GB.