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

Date: 19 March 2012

Dear Colleague,

The Smart Grids Forum – First Year Report and Publication of the Smart Grid Evaluation Framework Final Report

This letter sets out the progress made by the Smart Grids Forum (SGF) in its first year. It also announces the publication of the smart grids evaluation framework that has been sponsored by Work Stream 2 of the SGF.

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. In particular, the electrification of heat and transport and the challenges of integrating intermittent generation will bring new challenges for the Distribution Network Operators (DNO). It is also widely expected that by introducing more intelligent monitoring and control into distribution networks and engaging the demand side (i.e. elements of a smart grid) the cost of meeting these challenges will be reduced, compared with more conventional solutions.

Ofgem is committed to encouraging 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. Innovation is a central element of the RIIO[1] 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.

In April last year, Ofgem and DECC established the Smart Grids Forum (SGF) to provide further leadership to the industry on smart grid issues. The SGF brings together key opinion formers, experts and stakeholders in the development of GB smart grids to provide strategic input to help shape Ofgem's and DECC's policy making and leadership in this area. The Forum should also help provide the network companies with a common focus in addressing future networks challenges, ensure that whole system benefits are considered in this work and provide drive and direction for the development of smart grids.

The members of the SGF represent the network, supplier, generator, customer and manufacturer communities. More details about the SGF can be found on Ofgem's website including a full list of members.

[1] http://www.ofgem.gov.uk/Networks/rpix20/ConsultDocs/Documents1/RIIO%20handbook.pdf

Today we are publishing the final report of the SGF's project to develop a smart grids evaluation framework. We are also taking this opportunity to provide an update on the progress made by the SGF in its first year.

The Smart Grids Forum – the first year

The SGF met for the first time in April last year. The members of the SGF were selected through an open invitation[2] which generated considerable interest. Some sixty applications were received and members were selected based firstly on the contribution they could make personally but also ensuring that all relevant stakeholder groups were represented.

Following the first meeting of the SGF (all meeting notes are available here) five work streams were established to pursue specific activities. Real progress has been made by all the work streams and this is briefly reported here.

Work Stream 1 – Assumptions and scenarios

This work stream was led by DECC. Its goal was to provide data, consistent with the 4th Carbon Budget (2023-2027) of the Governments Carbon Plan, on the likely penetration of specific low carbon technologies that will impact the distribution networks in GB. DECC has provided this data for electric vehicles, heat pumps and solar PV for three scenarios up to 2030. This data is presented in the Work Stream 2 report that is discussed later in this letter. This work has provided a vital link between Government policy and the planning processes being developed by the DNOs.

Work Stream 2 – Smart grid evaluation framework

Ofgem led this work to develop an evaluation framework that can assess, at high level, alternative network development options. It has been successfully completed and is reported on in full below.

Work Stream 3 – Developing Networks for Low Carbon

This work is being led by the DNOs. A substantial initial report, "Developing Networks for Low Carbon", was published[3] in October last year. The report provides an essentially qualitative evaluation of the scenarios for change developed by government and others, assesses their impact for power networks and proposes responses that utilise innovative techniques where they are seen to be advantageous. Following publication of this report, an ambitious further programme of work was initiated building on the combined outputs from work streams 1 and 2. This work is now being developed co-operatively by all the distribution network companies and others within the SGF. The intention is to increase the level of detail in the model developed by Work Stream 2, particularly in respect of the distribution network modelling and the scope of the smart grid solutions available. Results from this work are due to be published in May.

Work Stream 4 – Closing doors

The SGF established this work stream in recognition of the risk that short term policy decisions could close off longer term opportunities. The main focus for the work stream has been the interaction between the smart metering programme and the development of smart grids. It has acted as a catalyst for discussions between DECC, the DNOs, the Institution of Engineering and Technology (IET) and SGF members. In particular, it has helped the debate about smart meter functionality in the context of network operation and the required performance of the communications infrastructure.

Work Stream 5 – Ways of working

This work stream is considering how the SGF can best pursue its objectives and communicate effectively with stakeholders. The Energy Networks Association (ENA) and

[2] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=3&refer=Networks/SGF

[3] http://www.ofgem.gov.uk/Networks/SGF/Documents1/Smart%20Grid%20Forum%20Workstream%203%20Report%20071011%20MASTER.pdf

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Smart Grids GB are jointly developing a programme of activities to make the work of the SGF and its key stakeholders as visible to interested stakeholders as possible. In particular, the ENA is committed to helping the DNOs to share the considerable learning that is being generated by the Low Carbon Networks Fund[4] projects. We will announce more developments about this work in May via the SGF website.

Smart Grids Evaluation Framework

Background

Despite the high expectations for smart grid solutions, there has been a lack of quantitative evidence to support their deployment, particularly in the near-term. A priority for the SGF is to address this issue; in particular as an input to the next electricity distribution price control review – RIIO ED1. The SGF's Work Stream 2, led by Ofgem, took up the challenge to develop an evaluation framework to assess smart grid opportunities relative to more conventional network development techniques.

At the outset of the Work Stream 2 project, it was decided that it should be split into three stages. In the first phase, we would establish the drivers for smart grid development, explore the distribution of investors and beneficiaries and propose a structure for a cost benefit analysis (CBA) model that could deliver a high level assessment of competing investment strategies; in particular smart grid solutions and the business-as-usual counter-factual. In the second stage, the CBA model would be built and validated. Finally, in the third stage, the data produced by Work Stream 1 and Work Stream 3 would be used in the model to draw initial conclusions about the benefits of different investment strategies.

Work Stream 2 has worked closely with Work Stream 1, led by DECC, to provide data relating to the expansion of low carbon technologies connecting to distribution networks. It has also engaged with Work Stream 3, led by the DNOs, to characterise the network and the smart and conventional solutions. Work Stream 2 also reviewed all the responses received as a result of the November consultation. These are reviewed in Annex C of the report and we have published all non-confidential responses with this report.

The evaluation framework has been developed by Frontier Economics working with EA Technology. Work Stream 2 has acted as a steering group for the work providing advice and guidance. The aims of this work were to help:

- achieve a better understanding and alignment across the industry on the nature of the costs and benefits from smart grids and the key factors that impact the business case;
- provide quantitative guidance that could help inform high level policy decisions (for e.g. whether the industry should start a programme of smart grid roll out now or invest only on a case by case basis); and
- provide a live tool which can be updated as better data becomes available/circumstances change etc.

Smart Grids Evaluation Framework – Work Stream 2 Final Report

Today we are publishing the final report of this project. The report builds on previous work[5] exploring the value drivers for smart grids and the smart grids evaluation framework consultation[6] that we carried out in November last year.

As far as we are aware, this framework is the first of its kind. It is an important step towards understanding the circumstances in which it is in GB consumer interests to invest in smart grids, rather than conventional network solutions.

The Smart Grid Evaluation Framework provides a methodology for assessing the likely value of smart grids under different scenarios and over different time frames. It highlights the key factors which drive the benefit case for smart grids. The report describes the evaluation methodology and provides initial results produced by the model. The primary

[4] http://www.ofgem.gov.uk/Networks/ElecDist/lcnf/Pages/lcnf.aspx
[5] "How to deliver smarter grids in GB"
[6] Smart grids evaluation framework - consultation - November 2011

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aim of this project was to develop a practical evaluation framework which can help improve understanding of the likely value of smart grids, and which can be updated as new information arises. The report does not provide a definitive view on the benefits of smart grids and its results should be considered as initial findings only.

As noted above, this work is now being developed by the distribution network companies and others within the SGF under Work Stream 3. Ofgem's high level goal is to engage with stakeholders, through the SGF, to develop a common methodology for assessing smart grid opportunities. We have recently launched our review of the price control arrangements for the period from 2015 to 2023 (RIIO-ED1). We aim to have a methodology which can be applied by the distribution network operators in assessing smart grid investment cases as part of their RIIO-ED1 business plans.

Key Deliverables

The key deliverables are the evaluation methodology itself, as described in the report, and the modelling tool based on it. The report describes in detail the methodology, including the ability to model the option value of specified network development strategies.

It sets out three future scenarios which have been developed with inputs from Work Stream 1 consistent with the Government's Carbon Plan[7]. These scenarios are combined with three network development strategies: a top down smart strategy; and incremental strategy; and a conventional strategy. The report presents a thorough review of the results produced by the model and explains the differences shown as the input assumptions are changed.

The initial findings suggest that, in the period up to 2050, smart grid solutions are likely to provide benefit to GB customers over conventional investment strategies, even in scenarios with a lower take-up of low carbon technologies. However, the framework indicates that the case for widespread rollout of smart rather than conventional methodologies in the period up to the mid-2020s may be marginal. This requires further detailed investigation.

It is stressed that there is inevitable uncertainty attached to the input assumptions made; for example, the rate of deployment of low carbon technologies and the price and performance of the smart network solutions. That said, the low carbon technology ranges described represent boundaries of expectation based on current analysis and within a framework to deliver the 4th Carbon Budget. It is interesting to note that the comparison between the smart strategies and the conventional strategy for the period to 2050 shows material benefits for the former against all scenarios.

However, the analysis carried out so far, as noted previously, provides less clarity on the issue of when widespread smart grid deployment should commence. This is a key question for RIIO-ED1 and we anticipate that the further work by Work Stream 3 will be useful in addressing this issue.

Next steps

This report concludes the first stage of the SGF's work to develop a common view on the methodology for assessing smart grid opportunities which can be applied by the distribution network operators in developing their RIIO-ED1 business plans. While this is not a consultation, if you do have observations about this work we would be pleased to hear from you.

We plan to make the model available to other parties that would like to explore the issues it is addressing. It is already being taken forward by the DNOs under Work Stream 3 and if other parties would like access to it they should contact Gareth Evans at Ofgem.

[7] http://www.decc.gov.uk/en/content/cms/tackling/carbon_plan/carbon_plan.aspx

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We have decided with DECC that the work of the SGF should continue. We are currently developing a work programme with DECC for its second year. This will be discussed at the 5th meeting of the SGF at the end of April and will then be published. We will continue to engage with the wider community of stakeholders and if there are any issues that parties consider the SGF should address in the light of this report they should contact Gareth Evans.

Finally, in the medium term, we expect to see learning from the Low Carbon Network Fund projects being fed into this evaluation framework to further improve our understanding of this complex subject.

Yours faithfully

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