A framework for the evaluation of smart grids

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About SmartGrid GB

SmartGrid GB (SGGB) is a not-for-profit membership organisation for stakeholders involved in any aspect of the development or delivery of smart grid in Britain.

Launched by Charles Hendry MP, Minister of State for Energy and Climate Change in June 2011, SGGB has been established by industry to provide an open and independent forum in which a wide range of concerned organisations can come together and share ideas and information in order to help shape policy and make a British smart grid a reality.

SGGB's members come from a variety of different backgrounds including the utilities, IT, communications and professional services sectors. As of December 2011, SGGB's growing membership includes the following companies: Airwave; Arqiva; British Gas; BT; Cable & Wireless; EDF Energy; Elexon; GE; HP; IBM; Intellect; Oracle; Power Plus Communications; SAP; Scottish Power; Sensus; Siemens; Toshiba; UK Power Networks; Utiligroup; and Wipro. The Department of Energy and Climate Change (DECC) and Ofgem are observer members of SGGB.

Introduction

SGGB appreciates the opportunity to respond to this consultation and we would like to commend the work of DECC and Ofgem in establishing the Smart Grid Forum (SGF). Smart grid development represents a major opportunity for Britain. It will help address policy concerns such as how we ensure the delivery of sustainable, affordable and secure energy for generations to come; and it will also provide significant economic growth opportunities for the British economy – particularly important in this period of low growth and economic instability.

By establishing the SGF, DECC and Ofgem have demonstrated that they are committed to addressing the challenges facing smart grid development in Britain and that they see engagement with industry as playing a central role in helping them to define the next steps that need to be taken to make a British smart grid a reality.

SGGB and SGF have an excellent working relationship: SGGB's Chairman is a member of the SGF; DECC and Ofgem are observer members of SGGB; and the two groups share some mutual members. A good example of this working relationship in practice was a workshop in October 2011 which provided SGGB an early sight of Frontier Economics' evaluation framework and an opportunity to provide an early cross industry view on their draft.

As a result of SGGB's previous engagement with Frontier Economics on the evaluation framework, our comments on this specific consultation are relatively brief. Where possible, SGGB has sought to offer comment on every question in the document but where comment has not been necessary the question has simply been left out.

SGGB is looking forward to continuing its engagement with the SGF throughout 2012. Should Frontier Economics or the wider SGF have any questions on the answers included in this response, please contact Rob McNamara at robert.mcnamara@smartgridgb.org or on 0207 331 2017.

Response

Section 2: smart grid evaluation framework

Do you agree with our definition of smart grids?

Yes.

Have we captured the main complexities associated with assessing the costs and benefits of smart grids?

SGGB believes that two further complexities associated with assessing the costs and benefits of smart grids could be usefully highlighted. The first concerns the fact that GB is a unique marketplace where smart grid development is essentially consumer driven, as opposed to being driven by the networks. As a result, it is difficult to imagine how smart grid technologies will fare in the UK, even if they have been trialled with relative success in other geographies. SGGB would recommend giving this complexity more emphasis in the framework.

The second complexity concerns the wider enabling possibilities of smart grid. Whilst this is partially covered under the sub-heading 'smart grids as enabling technologies', the benefits that smart grid could bring to other parts of industry and society add further complexity to conducting a CBA and should be expanded upon in this section of the document. For example, smart grid could potentially deliver economic benefits to wider industry through cheaper energy costs. Similarly environmental benefits derived from smart grid development, and the opportunity for them to be spread across wider industry, should also be kept in mind when assessing costs and benefits.

Do you agree with our approach to dealing with these complexities, in the overall evaluation framework?

Yes. SGGB agrees with both the decision to take a two-stage decision tree approach as well as the decision to use 2023 as the decision point in the analysis.

SGGB would like to ask that Frontier Economics clearly identifies complexities that they feel are not dealt with sufficiently in the final framework so that industry can take a view on what further work should be undertaken in the future.

Section 3: value drivers and scenarios

Do the technologies set out in table 2 constitute a sensible list of value drivers?

Frontier Economics list the following technologies in their document:

- EVs;
- plug-in hybrids;
- vehicle to grid technology;
- heat pumps;
- heat pumps with storage;
- solar PV;
- small scale wind;
- DG - large scale on-shore wind;
- DG – small site wind;
- DG – biomass;
- large-scale low-carbon plant (nuclear, wind and CCS);
- distributed large-scale wind, biomass;
- technologies which add flexibility on the supply side (bulk storage, interconnection)

In addition to these technologies, SGGB would recommend including technologies such as: feeder and substation automation, power routing, DC interconnection at LV level and network attached storage.

Whilst technologies such as these are used on the networks and, in turn, are not a visible part of the grid, SGGB members believe that they will be fundamental to building a network that is able to cope with the kind of customer visible technologies already listed in the consultation document. Without these fundamental network technologies, the customer visible technologies listed in the consultation will either be much more expensive to implement or much more difficult to implement.

Do you agree with our assessment of the technical characteristics of each?

Yes.

Are there any other technologies that could have a significant impact on the value of smart grids?

Yes. SGGB would recommend including the additional technologies listed in the preceding question but one, namely: feeder and substation automation, power routing, DC interconnection at LV level and network attached storage.

Section 4: smart grid and conventional investment strategies

Do you agree with our proposed approach of including smart appliances in business as usual?

SGGB agrees with the approach of including smart appliances in BAU but would recommend that the fact that there is a risk inherent in doing so should be made more explicit in the evaluation framework.

Do our proposed smart grid strategies capture the main deployment options?

Yes.

Have we provided an accurate overview of the main services that smart grid technologies can provide?

Frontier Economics outline the main services of smart grid technologies as being: the provision of data on the distribution networks; assistance in optimising network power flows; the facilitation of DNO-led DSR; and the provision of embedded storage.

The only additional service that SGGB would add to this list would be 'supplier led DSR.' A more general suggestion from SGGB members was also to include the additional enabled services and benefits that smart grid will deliver across other industries and wider society.

Do you agree with our proposed assumptions on the characteristics of these technologies?

Yes.

Section 5: value chain analysis

Are there any other groups in society that we should consider in the value chain?

SGGB would simply suggest amending the current description of consumers to 'domestic and non-domestic consumers.'

Do you agree with our conclusions regarding the distribution of costs and benefit?

Yes, though SGGB would recommend listing one additional benefit of smart grid technologies for both DNOs and TNOs: the benefit of keeping networks 'alive' when, for example, experiencing demand strains or when a major fault is detected early through the usage of smart technology.

Section 6: proposed model specification

Are the voltage levels (from 132kv down to LV) being considered by the model appropriate, or should the model be limited to focus on any particular voltage levels?

SGGB believes that the current voltage levels being looked at by the model are appropriate, though in the future SGGB would expect other voltage levels to be looked at too.

Is our approach to estimating the clustering of low-carbon technologies appropriate? Or is any other evidence available in this area?

Yes, SGGB agrees that Frontier Economics' approach is appropriate. However, SGGB members believe that technology clustering is a big risk area for smart grid development and should be acknowledged as such. In particular, SGGB would recommend that Frontier Economics be particularly mindful of the expected prevalence of clustering in specific areas across Britain.