

**MINUTES OF THE SECOND MEETING OF THE
ENSG SMART GRIDS WORKING GROUP
Held at BIS Conference Centre, Victoria Street, London, SW1H 0ET
14:00 – 17:00 Thursday 20th August 2009**

Present:**Co-Chairs**

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|-------|---------------------------------|
| DECC | Giles Scott |
| Ofgem | Gareth Evans (Chair on the day) |

Members

| | |
|-----------------------------|-----------------------|
| Eon Central Networks | Jeff Douglas |
| National Grid | Michael Edgar |
| EDF Energy Networks | Dave Openshaw |
| RWE Npower | Chris Harris |
| SEDG | Goran Strbac |
| Centrica Energy | Fiona Navesey |
| CE Electric | Dave Miller |
| Scottish Power | Diyar Kadar |
| Scottish & Southern Energy | Stewart Reid |
| Energy Research Partnership | Charlotte Ramsay |
| ETI | Richard Knight |
| Western Power Distribution | Phil West |
| REA | Tim Russell |
| REA | Gaynor Hartnell |
| SGS | Graham Ault |
| Intellect | Ben Anderson-Tuffnell |
| Electricity North West | Mike Kay |
| The Carbon Trust | Martin Johnston |
| Scottish Executive | Mike McElhinney |
| Energy Networks Association | Andy Phelps |

Also in attendance

| | |
|--------------------|-----------------------------------|
| Accenture | Robert Hopkin |
| Accenture | Simon Giles |
| Accenture | Rick Hanks |
| Accenture | Chris Maynard |
| Accenture | Jeff Taft (by video link) |
| Accenture | Bartosz Wojszczyk (by phone link) |
| DECC | John Christie |
| AEAT (Secretariat) | Chris Naish |

Apologies

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|-----------------------------|-----------------|
| Energy Networks Association | Alan Claxton |
| CE Electric | Alan Creighton |
| Smarter Grid Solutions | Bob Currie |
| Smarter Grid Solutions | Alan Gooding |
| DECC | Lorraine Hamid |
| Scottish Executive | Colin Imrie |
| Intellect | Nick Kalisperas |
| The Carbon Trust | Garry Staunton |
| DfT | Sachin Suchak |
| Western Power Distribution | Nigel Turvey |

1 Welcome and Introduction

- 1.1 The Chairman welcomed the participants and asked if everyone would introduce themselves as there were a number of new members and faces since the last meeting.
- 1.2 Apologies for absence and alternates attending were noted.
- 1.3 The Chairman asked the members whether they had any items they wished to add to the agenda. None were raised.
- 1.4 The Chairman mentioned the Low Carbon Networks Fund that forms part of Ofgem's initial proposals for the 5th Distribution Price Control Review, currently being consulted on. Assuming that this fund does form part of the final settlement with the DNOs it will encourage and provide funding for Smart Grid developments, subject to them meeting certain criteria.

2 Minutes of last Meeting and Actions

- 2.1 The Chairman asked the group if they had any comments on the minutes.
- 2.2 No substantive changes were noted. The point was made that the minutes possibly did not convey the key high-level reasons for taking forward Smart Grids. This was noted and the Chairs and secretariat agreed they would address this in the web pages they will shortly add to the ENSG website which will include the group's TOR, membership and the approved meeting minutes.
- 2.3 The question was asked as to whether the Smart Grid working group vision and road map was for Great Britain or the UK?
- 2.4 The minutes were formally approved and would now be placed on the ENSG website.
- 2.5 The actions from the last meeting were agreed as completed apart from actions 7 and 9. Action 9, the definition of Smart Grids, was an agenda item for the meeting. The Chairman noted that Action 7 was an ongoing action – 'Members to identify relevant Smart Grid initiatives and projects they are aware of and send web links, summary documents etc to the Secretariat, with copies to the joint Chairs'. He thanked those members who had sent information and encouraged members to continue to identify relevant initiatives so that they could be brought to the attention of the group.

3 Accenture – Introduction to Team and Smart Grid Experience

- 3.1 The Chairman invited the consultants appointed by DECC to provide technical support to the group and lead the development of the Vision and Route Map, Accenture, to introduce their team and make the presentations listed on the agenda.

World Economic Forum Report Summary

- 3.2 Accenture summarised the key points from the report they had produced in partnership with the World Economic Forum – 'Accelerating Smart Grid investments' that had been circulated to the group ahead of the meeting.
- 3.3 The report examines the barriers to rapid adoption of Smart Grids worldwide and is in 4 parts:

- Definition of the Smart Grid
- Barriers to adoption
- Solutions
- Stakeholder groups and the identification of the key actions they need to take to facilitate and drive the adoption process.

3.4 During the presentation and discussion the following key points were made:

- A one-size fits all solution is not practical or desirable – hence the introduction of Archetypes – examples Mumbai, China, London. All are very different in *inter alia* their inherited infrastructure and regulatory and market structures. In each case the systems have to be examined down to their circuit levels to develop (evolving) solutions.
- The regulatory construct and alignment needs to change – most are presently designed and structured to drive cost reduction, reliability and adherence to standards and codes. The higher levels of innovation and flexibility inherent to Smart Grid development and implementation will require a revised set of regulatory constructs and incentives.
- The benefits of Smart Grids are delivered throughout the network value chain. This is easier to recognise in a completely integrated energy system where generation, transmission, distribution and supply are owned and operated by one party. In a fully segmented market such as exists in the UK and, to a lesser extent, in Europe and parts of the USA, making the case for Smart Grid investment is more difficult as only parts of the value chain are accessible and relevant to each party.
- Some of the benefits e.g. those associated with mitigating climate change are less easy to monetise in the value chain relying on carbon pricing and support mechanisms such as feed in tariffs and obligations and have inherent policy and price risks that are possible barriers.
- The technologies of the Smart Grid are often (but not always) immature and have their own technology risk.
- The fracture of the supply chain is a key barrier in itself: the value chain in the GB market is highly segmented and this will need to be addressed in the group's Vision and Road Map.
- Access to, and cost of, capital will be a possible issue as the network companies change to possibly carrying more risk.
- The communication platform for the Smart Grid is a key issue – requires co-ordination between Ofgem and Ofcom?

3.5 In summary, the network operators confirmed that, related to the issues raised above, at the present time it would be very difficult to make an economic case for many Smart Grid investments.

3.6 DECC closed out the presentation and discussion by requesting the group to bring forward as many issues as they could. While they could not all be incorporated in the Vision paper they would be particularly important in ensuring that the subsequent Road Map addressed the correct priorities and issues in a timely manner.

Overview of Smart grid: Xcel Energy Bolder Colorado Trials

- 3.7 Jeff Taft of Accenture joined the meeting via a video link to provide a summary of the work Accenture have been doing with Xcel Energy, a fully vertically integrated utility that operates the electricity generation and supply network in Bolder, Colorado.
- 3.8 Xcel have taken forward this trial because they want to position themselves as a green utility and selected Bolder as a small city that is not particularly well connected to the wider US transmission system and also contains a higher than average proportion of environmentally aware consumers within its population.
- 3.9 In summary Jeff made the following points on the Xcel Bolder trial.
- Xcel is a fully integrated utility and is the only utility that supplies Boulder. Xcel does engage in energy trading and buys some power on the open markets, including wind power.
 - The existing distribution system had 4 main substations, limited EMS and substation SCADA systems and, as mentioned above, is not strongly interlinked to the wider Xcel/ US transmission systems.
 - Xcel is trying multiple approaches to some aspects of the smart grid installation at Boulder and has built a communication system that is intended to avoid any possible bottlenecks. Xcel recognizes that perhaps not all elements of the Boulder system will be used in a system-wide rollout, but what has been built at Boulder is intended to stay as production equipment and solutions.
 - The original plans included 24 value propositions initially; they now includes more than 60.
 - The Smart Grid is now built and is entering the trial operation, evaluation and data collection phase. This will run until the end of 2009 and on into 2010 to test the benefits and collect information to build future business cases.
 - There are two separate Smart Meter systems – a residential one covering 25,000 homes and an industrial and commercial one. The smart meter systems are teamed with a range of product bundles ranging from smart meters plus a energy web portal at the basic end through to smart meters plus whole house controls, variable tariffs and indicators of when renewable energy output is higher or lower on the grid to allow consumers to schedule their flexible usage to match more environmentally benign generation. The residential smart meters are widely deployed. Some of them are also used as part of the Demand Response element of SmartGridCity. The C&I meters are not used in the Demand Response project elements, since at SmartGridCity, Demand Response is focused on residential use.
 - The sub-stations have been automated and are connected via an optical fibre ring. Distribution automation is also via fibre ring. A fibre ring also links up the residences - actually this is a hybrid of fibre and BPL. The residential meters have BPL cards in them. Fibre rings were selected to avoid any constraint from this element of the overall Smart Grid system – it is not an indication that this will always be the communication medium of choice.

- The Bolder Smart Grid also has examples of energy storage, electric vehicle charging and virtual power plants.
 - Issues identified to date and that need considering in moving to a larger scale implementation include data handling, selecting technology solutions, managing the scale up of data handling, collection and analysis; security – e.g. control of loads using remote servers possibly based overseas has been ruled out.
 - The virtual power plants use a bespoke control system that takes into account the full Bolder generation portfolio and also can aggregate the various generation technologies and demand side loads such as (e.g.) wind turbines, storage batteries and pool pump systems.
 - The consumer involvement in the trial has been on a voluntary basis with multi layer incentives offered for participation at the varying degrees. The basic incentive offers rebates against energy charges, the implementation brings inherent energy savings and the consumers who have signed up for demand response can opt out of this for a limited number of occasions. The majority of the population have opted in for smart meters while 20% are signed up for demand response. One of the key parts of the trial is to gain data on customer demand side response. Xcel believe this will vary across the US in moving between groups with differing levels of environmental awareness etc.
- 3.10 The Chairman thanked Jeff on behalf of the group for his excellent summary of the Xcel Energy Smart Grid City trial.

Overview Smart Grids: – China

- 3.11 Bartosz Wojszczyk of Accenture briefly described work Accenture was involved in China via a teleconference link. He outlined that China had a \$700 billion investment plan for Smart Grids that was focussing on delivering a reliable and strong transmission grid that could deliver renewable energy from Northern China to the demand centres in the central east and south east of the country. The systems also involved distributed generation, demand response and evaluation of energy storage technologies.
- 3.12 It was noted that the main investments were in transmission systems and were therefore of less relevance to the group than the Xcel trials. There were however some distribution level activities such as investments by Shanghai Power in a significant AMI (Advanced Metering Infrastructure) programme.
- 3.13 A question was raised as to whether there was any public domain publications on these developments in China. BW agreed to investigate this and report back to the group although he commented that much of the work involved proprietary systems and hence limited detailed information would be available.

Action 1: Accenture (BW) – forward any relevant published information to the secretariat.

- 3.14 On behalf of the group, the Chairman thanked Bartosz for his presentation.

4 Smart Grid Vision and Road Map

- 4.1 The Chairman invited Accenture to outline their proposals for delivering the Vision and Road Map.
- 4.2 Accenture presented a series of slides (copies are attached with these minutes) of the key issues, inputs and timelines for delivery of the Vision, with a cost benefit analysis (CBA) and the Road Map.
- 4.3 Accenture made the point that the CBA was crucial and that input from the group on the values to be used in it would be very valuable. Putting values on the societal benefits would be an important component of this.
- 4.4 The following points came out during the presentation and discussion.
- Smart Grids have a potentially valuable role in controlling energy price spikes – dealing with volatility, minimising spinning reserve etc.
 - The view was expressed that the implementation of a significant proportion of smart grid would result in fewer power stations being required –especially low load factor plant – this is likely to represent the largest saving in the CBA for smart grids, although less wires etc should also deliver incremental benefits.
 - There would be a need to define clearly benefits in the CBA which were attributable to the smart grid and separate those from the benefits from the present policy for the roll out of smart meters.
 - It was agreed that smart meters could be implemented without smart grid and vice versa but clearly smart meters enabled elements of the smart grid especially at the customer and microgeneration network interface.
 - The point was made that the discount rates for new investments that were used in network operator assessments (6.9%) were significantly different from the government infrastructure discount rate of 3.5%.
 - There were potential ‘small price ticket’ smart grid elements that could result in benefits flowing through sooner rather than later – a hypothetical example was given of every home having a storage heater that could be controlled through the smart grid interface. Voltage sensing devices with cheap switching solutions on relevant demand side loads was another example. ‘Smart is Simple’ was a proposed mantra for early developments.
 - The three timeframes of the CBA are 2020, 2030 and 2050.
- 4.5 Summarising and concluding the discussion, Accenture made the point that the timescales for delivery of the Vision meant it had to focus on the ‘big signals’ and it could not examine a wide range of possible scenarios – it had to identify the main factors that would influence the benefits, but recognise the other issues that could be looked at again in the Road Map.
- 4.6 Accenture requested that the group contribute their input to the Vision as soon as possible. To facilitate this, Accenture will be circulating a weekly updated version of the vision each Friday from now until the end of September. In addition they would produce a draft list of factors to be included in the vision CBA for comment and input from the group.

Action 2: Accenture (RH) to provide updated vision draft to secretariat by 14:00 each Friday from now to September 25th.

Action 3: Members to provide comments and input to vision draft asap after issue.

Action 4 : Accenture (RH) to provide draft list of factors for CBA to secretariat for onward transmission to group by 25th August.

Action 5: Members to provide comments and input on CBA document.

4.7 The network operators agreed they would provide the smart meter specification that they had developed within the ENA.

Action 6: DO to provide ENA smart meter specification to secretariat by 25th August.

4.8 Accenture offered to share information they had developed on a communications platform assessment they had carried out for the UK covering issues such as latency and bandwidth requirements.

Action 7: Accenture (SG) to send communication platform assessment to secretariat by 28th August.

5 Discussion of Outline Vision Document

5.1 The Chairmen introduced the discussion by stating that the vision needed to provide a strong policy context for Smart Grids going forward and a positive CBA. It must link to the 40% of electricity from low carbon sources by 2020. The vision must be driven by clear requirements and show that Smart grids can satisfy and deliver solutions that provide clear advantages; it must not be seen as a technical solution for its own sake.

5.2 The vision and CBA should use the ENSG Transmission 2020 report 'gone green' scenario as its generation mix base. It should not look to evaluate the consequences of a range of mix scenarios but assess the broad, significant benefits of pursuing a smart grid option across networks.

5.3 The Chairman asked whether the group had any comments on the summary description of the smart grid on page 18 of the draft vision. The following comments were made:

- Add 'cost effectively'
- Add 'make better use of'
- Add 'more from existing capital assets'

5.4 The following points were made during the discussion of the vision document.

- It would be beneficial to add in examples of low cost smart grid technologies to show that developments could be cost effective with short pay backs of the smart grid
- The vision should develop the business case first, ignoring ownership boundaries, and then map this onto the industry players
- The current vision doesn't mention heat related issues.
- Xcel Energy have produced video trailers that explained the smart grid in layman terms – using a 'day in the life' type approach – this could be a useful thing to do in the GB context.
- Data security will be a key issue.

- The treatment of losses was raised – losses may increase as network utilisation rises – but it should be recognised that optimal efficiency of a network could be delivered by a well implemented smart grid.
 - How would the cost of carbon be treated in the modelling associated with the vision and CBA?
- 5.5 The Chairman concluded the discussion of the draft vision and encouraged members to be pro-active in commenting on and adding to the vision drafts as they were updated each Friday.

6 Definitions of the Smart Grid to be used by Working Group

- 6.1 The Chairman thanked those who had responded to the action to review the definition that had been included in the group's TOR. These had been assembled and issued to the group ahead of the meeting.
- 6.2 The secretariat reported that there had been two groups of responses – a number of members had added qualifying statements to the original definition, others had stressed that brevity and conciseness would be advantageous.
- 6.3 It was agreed that a definition in two parts the first of which gave a concise high level definition and which was followed by further description that enlarged upon and clarified the high level definition would be a good compromise between brevity and covering all aspects.
- 6.4 It was agreed that the group would review the definition as circulated prior to the meeting to provide a final set of comments that the secretariat would incorporate and circulate a final version to the group.
- 6.5 Definition Fiona Navesey agreed to send a supplier side definition of Smart Grids.

Action 8: FN send definition to secretariat by 28th August.

7 Next Steps

- 7.1 The Chairman summarised the next steps:
- Accenture would re-issue the vision incorporating their work and the comments from the group each Friday from now until 25th September.
 - Accenture would draft out a list of issues, data requirements and other factors to be included in the CBA by Tuesday 25th August
 - Group members to provide comments and input to the weekly issues of the updated vision as soon as possible after issue.
 - Group members to provide comments and input to the draft CBA issues list by Tuesday 1st September.
 - Accenture to prepare a Powerpoint presentation on the vision and CBA for the ENSG meeting on 30th September and circulate to the group for comment and input.

Action 9: Accenture (RH) to circulate draft Powerpoint presentation for ENSG meeting on 30th September to group by August 28th.

8 Schedule of Meetings and Close

- 8.1 The Secretariat confirmed the next meeting would be held on 25th September from 10:00 to 12:30. The meeting will be held at the BIS Conference Centre.
- 8.2 Further meetings are to be arranged by the secretariat for October, November and (possibly) December. These meetings are to discuss the Road Map to deliver the Vision. The dates of these meetings will be sent out shortly.
- 8.3 The Chairmen thanked the members for their attendance and input and closed the meeting.

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