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Ofgem
9 Millbank
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Ref 159/08

Dear Rachel,

Smarter Grid Solutions Ltd ("SGS") welcomes the opportunity to respond to the Ofgem consultation on the setting of appropriate price controls for the electricity distribution network operators for the period 2010 – 2015.

As a provider of SmartGrid solutions we recognise that we are not best placed to comment on all of the questions posed within the policy document. Instead in the discussion we have presented below we have focused on providing observations relevant as a supplier to the DNO community.

SGS delivers new network solutions that help generators connect to the grid and network operators meet connection obligations quicker and cheaper. More information on our products, services and consultancy can be found on our website at www.smartergridsolutions.com.

We agree that DPCR4 successfully initiated a move towards a new culture within the Distribution Network Operator ("DNO") community to look at new solutions via mechanisms such as the Innovation Funding Incentive ("IFI"), Registered Power Zone ("RPZ") and Distributed Generation ("DG") incentives. Our Active Network Management ("ANM") technology has in part been developed through IFI and RPZ projects, which have proved a valuable method for "proof of concept" projects. We also agree that although these incentives have initiated a shift they are not sufficient to embed this new culture and have innovation and flexibility at the heart of each decision making process.

From our own experience, we recognise a number of barriers facing both ourselves and other SmartGrid suppliers when looking to have new solutions adopted as business as usual deployments. This response aims to highlight some of these barriers and provide some suggestions as to how DPCR5 could be framed to encourage the deployment of new technologies, such as SmartGrids. We will use our own experience of ANM technology to highlight the challenges of a move towards a

more innovative and flexible operating model for the DNOs although we also recognise that other technologies may have differing concerns.

As you describe in your paper at 2.19, ANM can be described as "intelligent technology and control to better use the capacity of the network". Expanding upon this definition, ANM provides a means of control on the distribution network to operate the assets to their real time capacity as opposed to a capacity based on worst case scenario planning standards. ANM does not remove the requirement for protection but provides distributed monitoring and control to manage areas of the distribution network within network technical constraints. ANM can also be complementary to or provide a means of integrating other SmartGrid technologies such as demand side management, distribution automation, dynamic line ratings or energy storage. ANM can provide both a cheaper and quicker method of connecting renewable and distributed generation.

The benefits of ANM systems apply to both DNOs and also renewable developers:

DNO

- Maximise use of existing or planned network capacity
- Increased deployment of distributed generation
- Avoided or deferred network reinforcement
- Additional monitoring provides an indicator of network headroom

Renewable Developers

- Cheaper grid connection
- Increased development size (MW)
- Increased energy production (MWh)
- Reduced project timescales for generator connection compared to those requiring network reinforcement

Although there are a number of benefits to DNOs in deploying ANM these are offset against other business drivers, incentive mechanisms and commercial risks (these factors are discussed in greater depth below). The financial benefits to renewable developers are greater and more direct.

A key feature of ANM is the use of non-firm or flexible connection arrangements with participating generators, where for example, real power production may be curtailed as a result of network constraints such as those stemming from thermal ratings or voltage limits. Although ANM may provide a large theoretical increase in network capability the actual network capacity that an ANM system may release economically will depend on the amount of curtailment that a generator may face (MWh lost). As the generator is paid for MWh (energy and ROCs) they require a satisfactory forecasting of performance levels associated with connecting to an ANM scheme. Further, where multiple generators are exporting electricity via an ANM scheme they need to understand how they will be treated in relation to one another; the setting of appropriate principles of access is therefore critical. This has a number of implications for DNOs, to provide support for and consider:

- Investigations of the likely level of "economically viable" capacity that ANM will enable
- Curtailment estimates for developers
- Comparisons of costs and timescales of alternative ANM and reinforcement solutions
- Commercial arrangements in Connection Agreements to reflect the non-firm nature of the connection, the principles of access employed, and the need for review and audit procedures to ensure ongoing ANM operation reflects the commercial terms.

Although an ANM solution can be a significantly less expensive option to reinforcement a number of OPEX costs arise, for example:

- Auditing of system performance to maximize network capacity

- Auditing of system to ensure control action and principle of access compliance
- Additional communications equipment and maintenance is required
- Operation and support costs for ANM system evolution to accommodate further generators, network changes or demand changes
- Testing of fail-safe mechanisms (in much the same way as protection and load shedding systems are tested at present)
- Measurement system calibration and corroboration

Analogies can also be drawn between ANM systems and other technologies employed by DNOs, such as Energy Management Systems ("EMS"); however, a number of key differences also exist:

- Where EMS is a platform used to support all generator and load customers, the distributed intelligence of an ANM system is only used by a sub-set of the customer base
- Where EMS is used for all generator and load customers from "Go Live", the users of an ANM system only use the system when they are connected and controlled via the ANM system (causing the ANM system provider to incur liabilities).
- Where an EMS has a high initial CAPEX (liabilities for how the system operates are borne immediately by the DNO for all customers) an ANM solution is much more incremental in its deployment as new generation developments emerge or as the network changes. Therefore, to ensure appropriately attributed costs for these ANM related activities it is more appropriate for these support costs to be incurred "only as necessary" and incrementally throughout the ANM system lifetime – an OPEX charge.

ANM solutions therefore represent a "fit and manage" deployment as opposed to a conventional CAPEX focused "fit and forget" philosophy associated with network reinforcement. CAPEX and OPEX financial exposures are covered via different mechanisms (as highlighted in 2.55), with associated differing levels of commercial risk. This identifies one of the potential barriers to wider ANM deployment with many of the same principles also true for SmartGrid technologies in general.

Other risks from ANM deployment experienced and anticipated by DNOs include:

- **Risk of increase in operational costs**
  - Costs associated with maintaining, supporting and evolving the ANM system
  - Internal costs associated with reviewing multiple ANM options and incorporating them in long term network development planning
  - Consideration of ANM options as an integral part of connection requests will require additional resource
  - The proliferation of different emerging technologies will result in a requirement to increase the knowledge base of, and interaction of, planning and operation departments
  - The proliferation of additional data hubs and sources increases the data handling and security requirements
- **Risk to load customers**
  - Operational, safety and reliability performance as a result of using "unproven technology"
  - Impact on network performance
  - Erosion of authority over network operation
  - Impact of working assets closer to operational limits
- **Risk of bad investment decision in rapidly changing market**
  - Potential for stranded assets where a technology is deployed but may be superseded within a short timescale (this is particularly important in a non-standard

market where first mover advantage cannot be directly used to leapfrog competition)
- Potential non-compliance with emerging new standards
- Lack of tools and understanding incorporated in planning
- The proliferation of different emerging technologies may result in incompatibility issues

In addition to these complex risks and commercial issues, our experience is that the DNO will also make ANM investment decisions based on the mechanisms available to recover costs, the incentive mechanisms that can be utilised to support the investment case, the plans that exist for legacy asset replacement, and the impact these risks might have if they are actually realised.

The complexity of the decision making process coupled with the commercially and technically risk averse nature of the DNO community (appropriately so for a monopoly provider of a vital infrastructure asset) means that in many cases SmartGrid technologies are seen as a point of last resort once conventional approaches have been exhausted.

However, these conventional approaches may not be the most economically efficient solutions for their customers when the other valid concerns are addressed.

In a conventional non-monopolistic market, where the acceptance of higher levels of risk is more prevalent, the adoption of new technology is used as a means of identifying strategic competitive advantage where a business case can be presented and justified. In a regulated natural monopoly, with the various risks and complexities as outlined above, it is significantly more difficult to build a straightforward business case for ANM solutions despite the recognised benefits.

We would therefore encourage Ofgem to consider the need to recognise additional technical and commercial risks associated with deploying SmartGrid technologies in setting cost recovery, charging and incentive mechanisms.

SGS offer the following suggestions for Ofgem to consider as means of addressing some of these barriers to the wider adoption of SmartGrid technologies such as ANM:

1. Mechanisms should be incorporated within the settlement to allow innovative or flexible funding, commercial or charging models to be applied in support of SmartGrid deployments.

2. An incentive should be introduced to encourage network capacity to be made available more quickly using technologies such as ANM to both demand and generation customers.

3. ANM, as a particular SmartGrid technology, provides greatest and most direct benefit to the individual renewable developers being allowed to connect to the network and export electricity via the ANM system. Additionally the renewable generators connected via the system are the direct users of the system therefore Ofgem should consider the ongoing OPEX charges for operating a scheme to be recovered directly (as opposed to shared across all customers via GDUoS). Alternatively GDUoS could be amended to include an additional charge where a SmartGrid solution has provided a direct benefit (quicker or cheaper total connection cost) to the individual developer. As a further alternative GDUoS could be removed altogether and replaced with a mechanism to charge more accurately based on the actual costs appropriate to the individual customer.

4. ANM OPEX costs could be charged to the individual participating generators as a direct charge related to the shallow connection, removing the stranded asset risk from the DNO and hence wider consumers.

5. OPEX associated with the operation of a flexible SmartGrid deployment could be capitalised and added to the Regulated Asset Value.

6. All connection requests for renewable generation should require the DNO response to the developer to include how potentially less expensive approaches, such as SmartGrid technologies, have also been considered in determining the most cost efficient connection method.

7. DNOs should be allowed to recover additional costs (internal or outsourced) associated with the increasing workload required to consider multiple ANM solutions (or other technologies) as part of generator connection requests.

8. One potential incentive for DNOs to consider SmartGrid deployments could be where a SmartGrid deployment has deferred or reduced capital investment a proportion of the saving could be retained by the DNO. This would provide a means of introducing positive and healthy competition between DNOs to adopt new technologies and methods as a means of gaining competitive advantage (while continuing to balance other risks and incentives). The policy paper highlights that the agreed CAPEX spend has been an area where all DNOs have under spent during DPCR4 with the reasons unclear. Implementing such an incentive may therefore be difficult but would fit directly with rewarding improved forecasting and reporting.

9. Increasing the DG Incentive and/or the RPZ replacement incentive rates could have the effect of encouraging DNOs to take but manage the risks discussed above.

10. DNOs should be allowed to recover additional costs (internal or outsourced) associated with the increasing workload required to understand the technical and commercial implications of new SmartGrid systems and incorporate as a core requirement within strategic network planning.

11. The ability to charge for use of the network based on generated MWh, as opposed to MW connected, could be used to encourage DNOs to consider more positively ANM as a means of maximising the utilisation of network resources and balance out the commercial and technical risks associated with curtailed connections (and potentially future compensation payments).

12. The incentive mechanism replacing RPZs could be expanded to allow the integration of all SmartGrid technologies that provide benefits to renewable and distributed generation access and also other network performance metrics. For example, ANM hardware and software could also be extended to provide functionality for network automation loss reduction, amongst other things, thus bringing CI/CML and efficiency benefits from much the same infrastructure.

13. The incentive mechanism replacing RPZs could be expanded to allow more deployments of the same core SmartGrid technology to provide support to fledgling technologies that would not be made fully commercially viable based on a single RPZ trial. While additional learning (and hence RPZ eligibility under the existing criteria) could be claimed for second or third ANM system demonstrations where a technological, process or commercial innovation was being tested, DNOs appear to be nervous about this, fearing wasted effort in attempting to establish an RPZ on a more incremental innovation. Providing a clear set of rules and perhaps even a tapering of the incentives for subsequent demonstrations of innovation would support the maturing of beneficial innovations.

Although this response is designed to cover general SmartGrid technologies each SmartGrid technology area will undoubtedly have individual requirements. As a provider of ANM products, services and consultancy SGS has highlighted many of the barriers to the deployment of ANM solutions and suggested some means by which the regulatory framework could be changed to increase the adoption of SmartGrids and encourage further renewable generation in line with government targets.

In summary, we feel that the three overriding risks that are currently preventing DNOs from embracing SmartGrids and new technology in general are:

- **Risk of increase in operational costs**
- **Risk to load customers**
- **Risk of bad investment decision in rapidly changing market**

We hope that the barriers presented and suggestions highlighted above will provide relevant discussion against the questions posed within the DPCR5 policy consultation.

Best regards,

Alan Gooding

Managing Director