

14th May 2015

Maxine Frerk  
Ofgem  
9 Millbank  
London  
SW1P 3GE

**Ref. Quicker and more efficient distribution connections**

Dear Maxine,

Smarter Grid Solutions Ltd (SGS) welcomes the opportunity to respond to Ofgem's open letter on quicker and more efficient distribution connections.

As you will probably be aware, SGS provides a range of Active Network Management (ANM) products, tools and services to help electricity network operators design and deliver 'non-wires' alternatives for the connection of Distributed Generation (DG). We have worked with many DNOs to implement ANM solutions that have avoided or deferred capital intensive network upgrades while providing more cost effective and faster grid connections for new customers. ANM has improved network utilisation, extended network visibility and ultimately reduced customer bills.

At SGS we have a wealth of practical experience from our work on a number of ANM projects in the UK, North America and Europe, which we believe can provide insights to Ofgem's consultation. These include the active management of DG in rural and urban networks, the implementation of trials of domestic demand side management and large-scale electrical storage. Examples of SGS projects relevant to this consultation include the Orkney Registered Power Zone, Northern Isles New Energy Solutions, Low Carbon London, Flexible Plug and Play Low Carbon Networks, Lincolnshire Low Carbon Hub and Accelerating Renewable Connections; all of which use our ANM technology as the enabler.

This response offers our views on the questions raised within the consultation, which address an important but inevitably complex challenge. We have not provided specific answers to the questions set out in the consultation letter but have presented some general comments and discussion on the issues raised. We have also provided some commentary as to why connections may be slower and more expensive than necessary at this time and how ANM, as a general technology, can help remove this barrier for DG customers.

We have sought to present our contributions objectively and trust they will be helpful in shaping an important piece of work for the sector.

Best regards,

A handwritten signature in cursive script, appearing to read "Gerard Jochims".

*Pp.* **Alan Gooding**

**Commercial Director and Co-Founder**

## Key principles to consider for quicker and more efficient connections

Before we consider each of the four options presented in the letter we thought it worth highlighting the guiding principles that we feel should be adopted in the evaluation of any options. In general, we support the following:

**Least Cost:** Connection options offered to customers should always be the 'Least Cost Technically Acceptable' (LCTA). This is particularly important as innovative solutions developed as a result of LCNF and similar mechanisms must feed through to Business as Usual or there is a risk of DNOs continuing to do what has always been done. Any 'in advance' investment, whether for a conventional or innovative solution, should adopt the Least Cost option to customers.

**Compatible Timeframe:** Rather than simply being 'faster' we believe that the connection options offered to customers should simply be compatible with the timeframe required by the customer. If that means connecting within weeks or months then the options offered should be tailored to achieve this.

**Right Model:** In addition to least cost we think it also important that the method of paying for the investment needs to be right. For example, smaller developers or community schemes may find it easier to pay once they are generating revenue, rather than by means of a conventional CAPEX approach.

**No Detriment:** Benefitting new connections should not make other customers, including demand customers, worse off. There is evidence from across Europe of where socialising grid investment costs across demand customers has accelerated the penetration of DG, in particular renewables, but been at the expense of demand customers. For example, in Germany all network reinforcement beyond the point of connection is socialised; this reduces the cost of connection to the DG developer but pushes the costs onto demand customers. It is also worth noting that this approach fails to encourage development where capacity already exists as there is no incentive on the DG developer.

**No Discrimination:** Those who gain the most benefit should bear the most risk. We recognise that certain developers (e.g. communities or small developers) may find the current rules difficult to operate within, but we believe that all developers, regardless of size or ownership, should be treated consistently.

These guiding principles reflect many of the existing practices that Ofgem already adopts. We believe that they set good precedent and should continue to guide the decision making process through this consultation process. In summary, the new perspectives we describe here are to seek better facilitation for small players and to continue to look for ways of encouraging 'BAU' adoption of effective innovation in the network companies.

## Our view on the options set out in the letter

The following section describes our general response to each of the options set out in the letter.

### **Option 1: DNO funds anticipatory works (costs totally socialised).**



We see this option as difficult to justify as it carries significant risk to the overall cost of demand customer bills. This model would work best when a policy or directive creates a mandate for the investment to take place. Generally, however we believe that the costs (and risks) should be targeted on those that benefit most. We have seen other countries where reinforcement costs for DG are socialised across demand customers, and this has resulted in significant increases in customer bills. If controlled, and each investment is well evidenced, then this model could be most efficient, but we suspect that providing sufficient evidence will be difficult to achieve in practice.

#### **Option 2: DNO funds anticipatory works (costs socialised – initial customer).**

This is similar to Option 1 but with the benefit that some of the investment will definitely be used and therefore provides more evidence of need. For DG customers, having timely access to information regarding real time available capacity (such as online or 'live' heat maps) would go a long way to reducing the risk of the investment not being taken up. We suggest that some basic checks and a coordinated approach with key stakeholders including councils would also help identify the likelihood of the investment being more widely used.

#### **Option 3: Connecting customer underwrites investment ahead of need.**

We view this option as unlikely or needing a specific set of conditions to exist. This model introduces complexity which may well be to the detriment of future development or have other unforeseen consequences. We believe, for example, that it will be much harder for anything other than a conventional asset based solution to be considered. Smart solutions developed and funded through programmes such as LCNF would almost certainly not be able to be adopted in this model, so increasing overall cost.

Option 3 also discusses the consortium approach, which we believe is simply a more formal means of stakeholder engagement where commitment rather than just sentiment is sought. The approach of robust stakeholder engagement and demonstration of commitment from developers if led and facilitated by the DNO makes sense for any of the options and applies to conventional or ANM investments.

#### **Option 4: Other ways of making it easier to connect.**

We believe there should be stronger financial incentives on DNOs to encourage NTBM for new connections. While RIIO-ED1 has created some new incentives to encourage the adoption of new approaches we don't think it goes far enough. For customer connections the majority of the cost is passed through to the new connecting customers and does not fall within the incentivisation powers of the RIIO-ED1 settlement. As a consequence, there is little financial incentive for DNOs to offer and adopt new or innovative solutions to connection customers.

Achieving a faster speed of connection or offering a connection in a timeframe compatible with the development may provide an incentive for DNOs to adopt innovative solutions, but this will depend on the context and the traditional reinforcement alternatives available.

We will explore this issue in a little more detail in the remainder of this document and what we think Ofgem could do to further encourage the adoption of innovative solutions in order to deliver quicker and cheaper connections.



## Why are traditional connections slow and costly?

Britain's electricity distribution networks were designed and developed to operate passively and deliver uni-directional power flows from the transmission network to homes and businesses. The design standards to deliver this model, such as P2/6, were created to ensure security of supply to the range of types and sizes of customers connected to the system. They assume a passive approach to system operation with little or no interaction with connecting customers or network devices and in most cases with at least one redundant path to deliver electricity to consumers in the event of a planned or unplanned outage. This approach has served the country well, delivering highly reliable, safe and secure energy supply.

The last two decades have seen an unprecedented upsurge in the development of DG, most of which is renewable. In the UK alone, over half a million connections totalling 5GW have connected to GB distribution networks and this continues to grow today. The easiest and cheapest sites to develop have more often than not been developed, as hosting capacity for DG is offered on a 'first come, first served' basis. Design standards such as P2/6 have been adapted to DG but are based solely on security of supply for customers and do not take account of maximising DG hosting capacity on the networks<sup>1</sup>. This results in DG connections being planned using worst-case (minimum demand / maximum generation) assumptions that rarely, if ever, occur. Consequently many DG projects are not progressing because of the cost and time associated with the required grid upgrades necessary to maintain a passive worst-case approach.

## An Alternative: Managed Connections

Active Network Management (ANM) emerged in Britain through the Embedded Generation Working Group (EGWG) and subsequently the Distributed Generation Coordination Group (DGCG). These groups discussed the emerging requirements of ANM and previous DNO experience in a small number of instances where 'basic ANM' (a term used by the groups) had been deployed to meet specific individual needs. The publication of ANM guidance documents emerged from these groups in the form of ETR 124 and ETR 126. These activities, and the introduction of various regulated funding mechanisms for R&D and trials on the distribution networks (e.g. IFI and RPZ), led to ANM work being undertaken across GB to attempt to reduce the barriers to accommodating greater DG penetration on existing distribution networks by means of managed connections. Managed connections (also known as alternative or flexible connections) refer to the provision of non-firm grid access to DG. In essence, this means curtailing DG output, to the minimum extent possible, in order to relieve thermal, voltage or fault level constraints that would normally have been solved with network reinforcement, therefore also preserving passive operation. In exchange for non-firm grid access, the DG developer receives significantly cheaper and quicker network connection and any reinforcement investments to be socialised across demand customers are minimised.

Managed connections are now widely proven through a number of projects including:

- SSEPD: Orkney RPZ and NINES
- UKPN: Flexible Plug and Play and Norwich
- WPD: Lincolnshire Low Carbon Hub and Corby
- SPEN: Accelerating Renewable Connections

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<sup>1</sup> We note the current work to review P2/6.



All of these projects have demonstrated the benefits of managed connections for DG customers but the same approach could be equally applicable to demand customers in the future.

There are three main benefits of managed connections

### **1. Faster time to connect**

Managed connections can often be delivered within a shorter time period as there is no need for the lengthy consenting and construction periods associated with wired connections. An ANM system can be operational within 3 months, which aligns well with the speed of DG development.

### **2. Cheaper connection costs**

By using the real time capacity of the grid, there is no need for expensive traditional asset upgrades.

### **3. Option value**

There is always going to be uncertainty as to the extent, speed and nature of future development that may use new grid investments that have been made in advance. These new investments are expected to have a lifespan of 40 years or more. Given future uncertainty there is value in being able to better use what is currently available in order to make a more informed decision on the right investments to make as more information becomes available. As well as postponing capital intensive investment decisions, managed connections provide enhanced network visibility that signal to the DNO as available capacity becomes used up and can assist justify investment in network reinforcement (whether through Option 1 or any other model).

## Accelerating the availability of managed connections

Managed connections have been demonstrated through a number of DNO projects to be the Least Cost Technically Acceptable solution to deliver quicker and cheaper connections to customers. SSEPD led the development of the technology and approach and, with UKPN and WPD, are leading the way in offering this type of connection to their customers.

There are a number of reasons why it takes time to adopt such an approach (e.g. training staff, developing business processes, etc.) but we do not believe that all DNOs are moving as fast as they could to offer this quicker and cheaper connection alternative to their customers. We consider that all DNOs could be moving faster and, with huge swathes of GB now at 'red' on heat maps, there is an imminent risk that some DNOs will be a blocker to achieving 2020 renewable targets. This inconsistency across DNOs suggests that there are hidden barriers and failures of incentivisation in today's arrangements.

We offer here some thoughts on why, and what intervention Ofgem can make on behalf of new connection customers:

**Why?** The regulatory framework is currently creating an unintended barrier to the development of ANM and managed connections because ANM is not considered as part of the Regulatory Asset Base (RAB). The majority of ANM schemes deployed to date have been to enable DG connections and all ANM costs have been passed through to the connecting

customer. As a consequence it is not added to the RAB. We believe that the fundamental reason for slow progress on the widescale adoption of managed connections is that DNOs believe there is insufficient return for them in comparison to constructing and operating a new asset over 40 years as part of their RAB. There is therefore limited incentive (beyond the licence obligation to deliver the Least Cost Technically Acceptable solution) to offer anything other than an asset based solution.

It is our understanding that some DNOs have been absorbing ANM costs into DUoS and others have been leveraging specific ongoing costs onto the generators, in the form of an 'ANM Fee'. This is one of the areas that we believe has not been extensively examined.

**What?** As guiding principles we believe that customers should be offered:

- The Least Cost Technically Acceptable option whether that is wires based on alternative technology
- An opportunity wherever possible to connect within the timeframe necessary for their development
- OPEX as well as CAPEX options
- Cost effective and timely solutions that do not require demand customers to directly underwrite the risk of investment
- NTBM solutions, such as managed connections, as soon as possible. To ensure that developers in one area do not benefit while others in another zone or licence territory do not we believe that these solutions should be made available to all customers regardless of size or background.

The majority of the incentives under RII0-ED1 require DNO's to report on broader measures of customer service, and for this reason, ANM and other NTBM are not visible under these reporting mechanisms. However, we welcome the recent inclusion of NTBMs under the ICE incentive. The clear request for DNO's to consider innovative solutions and new commercial arrangements for connections customers should provide the necessary support to ensure that NTBMs are adopted into Business as Usual. **We think that it is important for Ofgem to ensure that the DNO nominated KPI's to measure ICE performance include satisfactory metrics to monitor progress on the adoption of NTBM solutions.**

Incentives or reporting mechanisms around network utilisation will go a long way to improving visibility of which DNOs are making the most of the capacity that they have, and so create much better visibility to enable investment choices. **We suggest that DNOs introduce a process to show the customer what other options, including non-asset solutions, have been considered when preparing the Least Cost Technically Acceptable connection offer.** This would greatly increase visibility and choice to customers and accelerate the availability of NTBM solutions where they are cost effective. **We think that Ofgem could insist on the inclusion of an ICE KPI and that this would be a useful metric. This could be augmented by reporting on average connection times, average connection costs and what actions have been taken to try to provide customers with viable connection offers.**

It would be helpful if Ofgem could ensure that, if any of the options set out in the Open Letter are adopted, it is made clear how ANM and other innovative solutions have been considered as part of the decision. This is important to giving an appropriate profile to innovation, alongside traditional thinking.



## In conclusion

We think it important to highlight the fundamental reasons for why connections may be slow or expensive in the first place and to ensure visibility of alternative viable approaches. We have sought to offer impartial commentary to this important consultation; the issues we raise apply to many innovative solutions, not only to products from ourselves at Smarter Grid Solutions.

If a conversation would be helpful we would be pleased to meet with Ofgem.