

## **Consultation on principles to be considered when recovering the costs of providing 'flexible connections'**

### **Consultation response to Ofgem by Smarter Grid Solutions Ltd.**

26<sup>th</sup> February 2018

Smarter Grid Solutions is a DER (Distributed Energy Resources) Management System (DERMS) software vendor. Our software is widely used in the UK to deliver Active Network Management (ANM) systems. Our products and services are targeted at smart, efficient integration of distributed generation (DG) and distributed energy resources (DER) into power systems to create value for multiple stakeholders in each power system timeframe from investment planning to real time control.

Flexible, digital approaches to integrating customers to the grid can save connecting DER customers significant capital costs and also reduce connection delays. We also provide independent consultancy on a broader range of topics in the power sector in the UK and internationally.

Smarter Grid Solutions has spent fifteen years researching, developing, deploying and proving our approach to managing flexible, smart grids. We have delivered a number of flagship ANM projects in the UK and overseas and worked with UK DNOs to publish key learning. We are recognised as leaders in this domain and have worked with, and learned from electricity distribution companies, national regulatory authorities, university research teams, generation developers, SCADA/DMS suppliers, grid edge device manufacturers, national labs and many others.

The application of flexible connections covers a wide range of scenarios (detailed below). In the majority of cases these costs are less than a capital solution for the full capacity. The only scenario where a flexible connection can cost more is where a timing issue needs to be resolved; here a flexible connection can be used to bridge the gap until a full capacity connection becomes available (e.g. both flexible and full capacity connection capital is being utilised). We know from our DER developing customers that their reasoning for doing this revolves around accessing earlier revenue streams, thereby increasing overall returns. Without this interim flexible solution in place, the scheme would not make investment grade. Crucially, the feasibility of any given offer is what is critical; not necessarily whether it is flexible or not. We believe therefore that flexible connections should be considered as a Minimum Scheme.

We also believe that customers should be provided with the choice between an upfront capital option (where the DNO takes on the risk of efficient procurement of the O&M services) or an option to cover the cost of O&M charges annually as they are incurred (where the connecting customer has more risk, but is still subject to challenge by Ofgem on the efficiency of the procurement). We believe this is an essential step to allow electricity distribution companies to offer flexible or managed connections.

Just as each capital focused connection offer is bespoke to the customer, flexible or managed connections and their operating costs should also reflect the complexity of the monitoring control technology required to operate the connection. **If the current charging methodology does not cater for this then it is acceptable to pass on third party costs to customers, so long as they are transparent to the customer and remain subject to an efficiency test (and do not expose customers to uncapped costs or costs that cannot be challenged). There should therefore be a clear definition and breakdown of the annual costs and reason for incurring them.**

We believe that the existing, CAPEX restricted methodology *promotes* network upgrade solutions. This is a consequence of the increased exposure of the network company to operating cost increases over the lifetime of the connection. The current charging methodology therefore encourages network companies to primarily consider the least cost capital solution to customer connections, rather than the least cost solution. The proposed approach appears to reflect the nature of managed connections and provides the ability to share the cost of the connection across the lifetime of the DER customer.

As residual network capacity developed for demand customers diminishes, ANM has become in many areas of the UK the only viable connection option. ANM, including operating costs as a lifetime cost, should be defined as the Minimum Scheme (e.g. the technically acceptable least cost solution) where it is cheaper than a capital option or prevents a delay to the customer connection. If not, **then all customers should be offered a least cost capital offer and a least cost alternative offer** to allow them to choose how best to connect their project and fund the cost of the connection.

Another limitation of the charging methodology is that **ANM systems are triggered regionally by individual connecting customers causing a ‘piecemeal’ roll-out of the solution.** To reduce capital and operating costs, improve efficiency and provide a faster response to customers some elements of ANM should be considered as core DNO infrastructure. ANM systems support a range of use cases and benefits and are seen as a key enabler for DSO. Central ANM infrastructure (central ANM software, control centre computing hardware, communications to network measurements points, etc.) should be considered a DNO asset, with the sole use assets being limited to those that don’t support multiple other uses (e.g. communications link to the DER, the DER control panel, commissioning works, etc.). This would:


- reduce capital and operating costs;
- improve efficiency; and
- provide a faster response to customers

While the DNOs made a significant step forward with the ENA published ANM Good Practice Guide, there remains a lack of understanding that not all ANM / flexible connections are the same. Different ANM options have been offered by different DNOs from timed connections, intertrips, full ANM to post-fault limits or full ANM to pre-fault limits. There is a lack of consistency in the offering to customers and less visibility of what the implications of each approach is. DNOs should be responsible for making clear the limitations of the ANM offer they are receiving and why they have offered the ANM type they have, and the impact on network access / export potential as a result of that selection.

In summary, we believe that:

- Further evidence and clarification must be provided by SSEN to present how the costs of flexible connections will be calculated, how they will be regulated and how customers will be charged. Evidence that customers support this move to annualised costs should also be provided.
- OPEX costs should be offered to the connecting customer as either a capitalised upfront offer or annualised as they are incurred. Both should remain subject to scrutiny and efficiency tests;
- ANM should be considered as a Minimum Scheme solution;
- Central ANM infrastructure should be funded by the DNO through the existing price control mechanism and not triggered by individual customers;
- Central ANM infrastructure supports a range of use cases and wider customer benefits therefore should be socialised and seen as a key enabler to DSO; and
- Customers should be made aware of the type of ANM connection being offered and the implications on customer risk or curtailment.

We welcome the opportunity to discuss any aspect of our response further.

A handwritten signature in black ink, appearing to read 'Mark Baxter', is positioned above the typed name and email address.

Mark Baxter – UK General Manager ([mbaxter@smartergridsolutions.com](mailto:mbaxter@smartergridsolutions.com))

Laura Kane – Senior Consultant ([lkane@smartergridsolutions.com](mailto:lkane@smartergridsolutions.com))

## RESPONSES TO SPECIFIC QUESTIONS

### 1. Do you agree with SSEN's approach to classify the costs relating to operating 'flexible connections' as 'Operation and Maintenance' (O&M)? Please explain your reasoning.

In general, we feel that there is a lack of evidence provided in the consultation documents that would allow us to make a clear and informed decision. Operating costs for the network are already captured within the existing DUoS framework and as such, are subject to regulatory efficiency tests. By moving the specific O&M costs for flexible connections outside of the existing category there is a risk that they will not be subjected to the same scrutiny and checks as existing O&M costs.

We appreciate that there are clear advantages to the connecting customer by approaching flexible connection costs in this way. It allows the customer to spread their connection cost over a 20 year period, rather than have the full cost required up-front, allowing them to fund it once they are generating revenue. Reducing the capital hurdle for connecting customers will promote network access. This would open up more opportunities for small developers who are currently struggling to obtain access to the network and build a suitable business model due to degradation of subsidies.

There are also clear advantages to the DNO as it reduces the perceived risk of increased O&M costs over the lifetime of the connection; a significant barrier to offering ANM more widely to customers. However, this does shift the risk on to the connecting customer. This risk could be mitigated by capping the cost.

We propose that OPEX costs should be offered to the connecting customer as either a capitalised upfront offer or annualised as they are incurred. Both should remain subject to scrutiny and efficiency tests.

**2. Do you agree with SSEN's proposed principle that a 'flexible connection' cannot be a 'Minimum Scheme'? Please explain your answer.**

No, we do not agree.

By classifying 'flexible connections' as non-minimum scheme, it effectively turns the definition of Minimum Scheme into Minimum Capital Scheme. Doing so fails to acknowledge the learning from various Ofgem-funded innovation projects that ANM can offer lower cost and more timely connections to customers. ANM enabled, flexible connections provide access to the network faster and at lower costs than most traditional arrangements in constrained network areas which, for the majority of Scotland and an increasing number of areas in England and Wales, is now the norm.

There are many real-world examples where a flexible connection offers a lower cost and better value for money than a 'minimum scheme'. Examples of this include, but are not limited to:

- The UKPN FPP scheme, which published multiple reports showing the cost differential between conventional and ANM enabled flexible connections. This ANM system, expanded to other areas of the EPN licence area has created over 100 MW of feasible connections for customers;
- On the Western Isles, SSEN facilitated the connection of 9 MW of generation using ANM to avoid an upgrade to the subsea cable which would have cost users of the system a socialised portion of the £30 million total upgrade price-tag. This cost was 'unfeasible' for these customers;
- The SSEN Orkney Isles ANM scheme, whose benefits have been well documented. The cost of the ANM scheme came in at a fraction of the cost of replacing the subsea cable and facilitated the connection of 26 MW of flexible connections; and
- The SPEN ARC project, which facilitated the provision of flexible connections to over 100 MW of generators in the Dunbar and Berwick network areas. In addition to this, those currently under a flexible connection are contributing to a share of the £6 million reinforcement costs showing how ANM can provide a key link to network investment. For generators connecting to the scheme, the ANM option introduced savings of between 20 – 60% (depending on generator capacity) and delivered the solution 6 years ahead of the planned reinforcement works.

It is also worth noting that Minimum Scheme in some cases is not a feasible scheme from the perspective of the customer – a better definition may therefore be 'Minimum Feasible Scheme' allowing all options, within the context of the customer, to be offered.

**3. Under the Common Connections Charging Methodology ('the CCCM'), the ongoing costs of operation and maintenance relating to additional assets requested by the connecting customer (over and above those associated with the Minimum Scheme) will be payable in full by that customer (not supported through the Use of System Tariff). Based on**

- **SSEN's interpretation of the 'Minimum Scheme'**
- **SSEN's proposed classification of flexible connections' costs as 'O&M', and**
- **the CCCM, under SSENs proposed methodology, the entirety of costs of 'flexible connections' will be borne by the connecting customer.**

**Do you agree with SSEN's proposed apportionment of costs of 'flexible connections' and stated rationale (that all of these costs are bespoke and specific to the connection, do not provide any value to wider use-of-system customers and should not be recovered from the wider customer base)? Please explain your reasoning....**

We believe that central ANM infrastructure costs should be considered as a DNO asset, supporting multiple benefits cases. At present ANM systems are triggered by one or more individual customers, per the charging methodology, and all costs (CAPEX and O&M) allocated to them. This results in piecemeal roll-out, increased overall costs and slower roll-out. To offer ANM consistently across the network we believe that this central infrastructure should be considered a DNO asset and O&M costs recovered as DUoS. Doing so will encourage more DSO functions and smart control solutions. It will also encourage wider customer benefits to be accrued, promote the principles of 'whole system' thinking and reduce overall cost.

We agree that the capital cost of the connection associated with the physical network infrastructure required are sole use and should be paid for by the connecting customer. For network asset costs, the benefit is primarily to the connecting developer/owner and they are subject to second comer rules if the asset becomes shared within a set period of time.

We agree that the costs for flexible connections are bespoke and specific to the connection in terms of the service level that is offered to the customer. That is reflected in the varying types of ANM connections offered across the DNOs. We suggest that a level of detail in relation to service provision should be provided in the flexible connection contract, and included in the calculation of the Annual O&M fee. Clarity on exactly what services the developer/owner will be paying for as part of the recurring flexible connection O&M cost is crucial.

**4. Are there relevant differences between types of flexible connections (e.g. timed, ANM, etc.) which should be considered in determining the approach to classifying and allocating associated costs? Please explain your answer**

Yes, each different type of flexible connection is different in terms of its cost, its ability to release network capacity, and its impact on the customer (in terms of curtailment).

There are a number of different flexible connections currently being offered across the DNO licence areas. Common options include:

- Intertrip (hard or soft) – if the network topology changes or an outage occurs, the generator is tripped from the network. Only closing of the circuit breaker will allow the site to continue exporting;
- Export limited – a fixed value is set which limits the export from the site under all conditions (e.g. even if capacity is available);
- Time Connection – the export from the connection is limited to a particular time period. This may include avoiding export during known periods of low demand; and
- Active Network Management – real-time monitoring and control of the customer against network constraints. This option provides set points to the customer should available capacity on the network be reduced. Within this option some ANM schemes are configured to post-fault limits rather than pre-fault limits. Furthermore, customer curtailment levels vary depending on the type of solution deployed.

In all cases, the connection is designed to protect the network when there is no longer capacity to host the connected generation. They all enable connection without the requirement to pay for extensive network reinforcements. There are varying degrees of complexity involved in each solution. Each solution also offers a different volume of hosting capacity to customers and has different impacts on customers.

Active Network Management schemes often require a central platform to monitor measurement points across the network and control a large number of generation as part of a centralised scheme. This coordinates the control of generation across the network. The requirement for a centralised component that can be targeted to flexible connections and other use cases across entire licence areas lends itself to being a socialised cost. Individual communications links and control panels should be considered sole use assets. This better aligns with other connection options, such as export limiters, where the local control component is more clearly a sole use asset.

5.

- a. **The following is primarily addressed to the Distributors. How do you currently classify and recover the costs of 'flexible connections'? What are the reasons for your approach? Does your approach differ depending on the type of scheme? How do you expect your current approach to evolve (if at all) over the medium term (next 3-7 years)?**
- b. **The following is primarily addressed to the connecting customers. We note that 'flexible connections' is not defined anywhere in the Charging Statement. SSEN is also proposing to remove paragraph 6.32 which details the 'operation, repair and maintenance' services they provide. What are your views on the clarity and internal consistency of the Statement?**
- c. **The following is primarily addressed to the connecting customers. What are your views on SSEN's proposal - that where there are annual third party costs incurred in operating the 'flexible connections', SSEN will pass these charges onto the customer on an annual basis?**

No comment.



**6. Do you believe the modifications made in SSEN's statement are reasonable and are in line with the Relevant Objectives? Please provide reasons for your response.**

Charging costs annually may increase risk to customers as there is a reduced visibility of these costs. Customers have no control over the DNO costs however introducing a price cap on these costs may reduce some of the risk posed to customers.

If the current charging methodology does not suitably cater for the costs associated with flexible connections then it is acceptable to pass on third party costs to customers, so long as they are transparent to the customer and remain subject to efficiency tests (and does not expose customers to uncapped costs or costs that cannot be challenged). There should therefore be a clear definition and breakdown of the annual costs and reason for incurring them.

We believe one of the key question that is not answered in the proposed modifications is how the capital and O&M costs of centralised infrastructure that supports ANM and other wider customer benefits is recovered. We believe this should be paid for out of current price control frameworks, as there is a strong case for this to be socialised thereby removing further barriers to the roll-out of flagship innovation projects that have proved immensely beneficial to customers. This becomes even more important as the DSO model develops and such management/flexibility becomes increasingly beneficial to the DNO (and all customers), as they now have the tools to create and participate in markets and services.