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By email only to: flexibility@ofgem.gov.uk

18 September 2020

Dear Steve,

Call for evidence: Visibility of distributed generation connected to the GB distribution networks

Thank you for the opportunity to respond to this call for evidence. This response is on behalf of UK Power Networks' three distribution licence holding companies: Eastern Power Networks plc, London Power Networks plc, and South Eastern Power Networks plc. We are the UK's largest electricity Distribution Network Operator (DNO), dedicated to delivering a safe, secure and sustainable electricity supply to 8.3 million homes and businesses.

We are supportive of there being greater visibility requirements for connections at lower voltages on the distribution network which will help enable system resilience and DSO functions. However we are also mindful that in removing barriers for new connectees to the network (which we also support) we must not inadvertently remove the need for these parties to give DNOs the requisite visibility and information pertaining to their connection. Furthermore, greater socialisation of available information from both Suppliers and other system and network operators would further enhance visibility for resulting in collaboration between the relevant actors and consequential system benefits. We fully recognise the benefits of open data in the energy transition to parties across the industry and beyond. Our responses are written with this in mind.

We have responded to your specific questions in the appendix of this letter.

I hope that you will find this information helpful. If I can assist further, please do not hesitate to contact me.

Yours sincerely,

James Hope
Head of Regulation and Regulatory Finance
UK Power Networks

Copy: Flo Silver, Manager, Systems & Networks, Ofgem
Paul Measday, Regulatory Returns & Compliance Manager, UK Power Networks
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Appendix

- **DCUSA modification DCP350 will provide data on a number of characteristics for DG greater than 1MW. Are there additional characteristics for DG, such as real-time MW/MVAr output, load factors and protection settings, which would aid in the prevention of, live management, and recovery from loss of supply events?**

DCP350 provides static data sets, which are useful for planning but not for providing visibility of DG performance in real-time. The current initiatives being progressed via Open Networks and subsequent code modifications will improve whole system coordination and avoid inefficiencies in approaches to network planning.

From a whole system perspective, a greater level of visibility and coordination of transmission services within distribution networks is required in both planning and close to real time timescales. Ideally these datasets should be provided and updated on a regular basis to ensure that networks continue to be managed efficiently and operational conflicts can be avoided. The recent communication from NGESO on 'Improving visibility of balancing service providers to DNOs' is a welcome step forward in attaining this and one which UK Power Networks fully supports.

For newer DG schemes connected to our EHV networks real-time visibility is generally good, as these employ broad spectrum measurement devices which are connected directly into are SCADA system. This becomes more challenging though for older sites with limited analogues and for smaller sites embedded in our HV/LV networks that are not directly connected via our SCADA system. Real-time visibility is essential for understanding how resources are performing and for aiding recovery from loss of mains events. EU code requirements, as captured in EREC G99, include a number of capabilities which we can begin to leverage (such as power quality and fault recording) and others which could if utilised in the future further enhance control and visibility. This does not, however, resolve the challenge with the significant volumes of generation already connected to the networks pre EREC G99. Improved monitoring of these existing sites and mapping into SCADA systems would create opportunities for a greater degree of live management and the ability to visualise DG that has become disconnected from the network.

In addition to real-time visibility, it should also be incumbent on DG to ensure that detailed information on their protection schemes is kept up to date and made available to DNOs as and when there are any changes or new data becomes available, thereby ensuring ongoing compliance with the user's obligations as detailed in the Distribution Code. Likewise this should also include the results of any periodic testing conducted on site, and of any other changes on site that would not ordinarily trigger the need for a modification application. If this information is provided periodically this will also be an opportunity for DG to ensure that contact and site ownership details are kept up to date with their respective DNO, an ongoing challenge as sites change ownership.

Where DNOs or NGESO are procuring services or renewing services contracts, say annually with DG, then as a minimum the generator should re-submit data on their plant and typical operating profiles to ensure that DNOs have the latest data. We should also be able to leverage real-time data from these service providers as a contract pre-requisite, where possible this should be a connection via DNO SCADA systems but equally leveraging data via web APIs is also a viable and tangible solution. This improved visibility will ensure efficient and economic utilisation of networks and help keep costs down for customers.

For those that are less likely to be involved in services, there could be an onus put upon the supplier who is paying them for the export, to ensure that all information has been updated with the DNO. This could be a pre-requisite before they can receive any export payments. This will far more effective than code changes alone.

It would also be useful to have a consistent standard for the data so that it meets with the requirements of users such as DSOs/DNOs. This will ensure that the information provided is consistent, in the right format and of the requisite granularity to enable the maximum potential benefits of this enhanced visibility to be derived.

In terms of specific characteristics on which data is required, these are noted below alongside the value they will bring.

- **What value will these additional characteristics provide to improving the planning, security and real time operation of the GB transmission and distribution systems?**

In general, the greater the level of network/DG visibility you have the more accurately you are able to forecast, operate and optimise capacity within the networks. Some of the other key value drivers include:

- Real-time visibility of DG coupled with fault reporting/alarms will enable a better understanding of what has operated and aid expedient restoration of supplies;
- An understanding of the availability and dispatch of ancillary services will allow service/operational conflicts to be mitigated and improve the overall optimisation of resources. Ultimately this will reduce costs where dispatch may otherwise have been mitigated by a conflicting action; and
- Ensuring SRS (Site Responsibility Schedules) are kept up to date. Our experience is that these soon become outdated once a site has been commissioned and then subsequently novated. This means that finding those actually responsible for operating/making decisions relating to the site can be an onerous if not futile exercise. This increases the time taken in both investigating and resolving operational issues.

- **What value will the above characteristics provide to improving DSO function delivery by the DNOs or other stakeholders? DSO functions may include network management, flexibility procurement, and service conflict avoidance.**

The data provisioned via DCP350/SWRR is useful in planning the network and potentially understanding where synergies in service requirements can be leveraged and networks can be better utilised.

A greater level of whole system coordination can improve network capacity assessments. We have seen the evidence of this from the UK Power Networks/NGESO South Coast RDP, where enhanced data sharing and modelling unlocked additional network capacity in the area. However, for this to have the most benefit improved visibility of NGESO actions is also required, both ahead of day and intra-day.

Real-time data/SCADA visibility and control brings value through closer to real-time actions being able to be taken, thereby optimising constraint management and potentially reducing the costs of otherwise conservative actions.

Enhanced visibility and control, alongside a greater degree of whole system coordination and data exchange will provide the means by which service and operational conflicts can be avoided and/or

managed. This ensures that actions taken on the network or by flexibility providers are well informed, and thereby are both cost efficient and effective.

- **At what temporal resolution (instantaneous, seconds, minutes etc.) would real time data on DG be valuable to improve the resilience of the GB electricity system in the prevention of, live management, and recovery from loss of supply events?**

Data should be available on a temporal basis that allows any changes in outputs and/or inputs to be captured on a second by second basis if required, but would be limited to capturing only threshold changes to avoid challenges with data storage. Apart from resolution, it will be valuable to have a requirement for DG systems to have time synchronisation to a time reference (for example using an SNTP (Simple Network Time Protocol) synchronised to a GPS signal) to ensure both DNO and DG data have same time reference for post-event analysis.

- **What investment would be required for monitoring, collecting, storing and disseminating real time operational data associated with DG? Which party should be responsible for these investments? How does this vary, based on the size of visible DG at 1MW or 50kW?**

The level of investment will vary depending on the volume of DG that needs to be addressed In terms of areas that would require investment: physical monitoring devices; on site SCADA work and integration/updates to live Distribution Management Systems; IT/IS infrastructure (e.g. server capacity). Other options that should be considered and further investigated include the use of web-link services to provide real-time/close to real time measurements, and then data analytics to map trends and/or extrapolate operating behaviours. A combination of both physical and virtual monitoring is likely to be the most efficient approach. We anticipate that web-link interfaces are likely to be the default method to interface with aggregators of DG assets and smaller DG.

We believe that there is also considerable value in exploring how changes can be made to certain areas in the Balancing & Settlement Code (BSC) to allow for metering data to be provided to DSOs in real-time. This could contribute towards the development of an economical solution depending on what data is available, what resolution it is provided in and how then it can then be leveraged in real-time.

There is a value in investing in establishing an internet protocol based communication interface with DG at substation levels to move away from hard-wired links that have limitations on data exchange and scalability. The ethernet based interface will however require investment for both network operators and DG operators in developing design, test and maintenance skills and business capabilities including cyber security risk management. This may be something that in the short term will work well for the larger sites, and will then over time as costs reduce and technology evolves become more viable at lower voltages.

Regardless of whichever party is responsible for managing this data, the standard/format of the data must meet the requirements of the DNOs/DSOs, so that the data can be utilised to deliver benefits.

- **What are the credible technical, regulatory (industry codes, licences and governance) and legal barriers and costs associated with increasing the data collected, stored and shared regarding DG operations, and in obligating parties to do so?**

If we were to require additional data or monitoring from existing DER, this could incur additional costs for DG and may potentially require changes to engineering standards (i.e. G83, G59, G98, G99) that impose retrospective requirements on existing DG. Additional costs for DNOs to collect and store the data would also need to be assessed based on the additional requirements.

In ensuring the site information remains up to date, this could be actioned via changes to sections in the BSC so that any changes to 'Parties' details are also passed on to the DNO. This could prove to be the least cost approach for all parties. As above, there is also an opportunity to explore changes within the same code which would allow metered data to be shared in real-time with DSOs.

To facilitate flexible and scalable data exchange using an ethernet (TCP/IP) interface with DG, there are costs associated with implementing and maintaining protocol based communications and cyber security solutions.