Centrica plc
Regulatory Affairs
Millstream
Maidenhead Road
Windsor
SL4 5GD
www.centrica.com

Steve McMahon
Deputy Director, Electricity Distribution & Cross Sector Policy
Ofgem
10 South Colonnade
Canary Wharf
London
E14 4PU

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Sent by email to: flexibility@ofgem.gov.uk

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

Dear Steve,

We fully support a robust assessment of both distributed generation and the distribution networks to ensure that visibility can be improved at proportionate cost to generators and end-customers.

Centrica Business Solutions provides energy optimisation services for a wide range of businesses with more than 6,000 operational distributed energy assets and therefore we are well-placed to discuss these matters.

Ofgem's priority should be to ensure that Distribution Network Operators (DNOs) are appropriately monitoring their networks at all voltage levels. By monitoring the data in real-time and sharing the data with the Electricity System Operator (ESO), the ESO will have better visibility of the system, thereby ensuring security of supply at lowest cost to consumers.

Aside from the need to improve monitoring of the networks, Ofgem also consider further options to improve visibility of standalone generation connected to the distribution network. Ofgem could consider whether it would be appropriate and proportionate for distributed generation to provide a regular data feed to the Electricity System Operator (ESO), providing information on assets connected, such as its generation profile. Furthermore, Ofgem could consider lowering the threshold for mandatory submission of Final Physical Notifications.

Ofgem should consult further with industry on proposals. Centrica has technology and software solutions that could provide options for monitoring networks and distributed generation. We would be happy to participate in roundtables and bilateral discussions to consider the merits of proposed changes and how these could be enabled.

Yours sincerely,

Jack Presley Abbott
Head of Wholesale Energy Regulation
Centrica Regulatory Affairs & Policy, UK & Ireland

Appendix – responses to Call for evidence questions

We have considered all the questions posed by Ofgem and believe that three items need consideration by Ofgem:

Better monitoring by DNOs of their networks

We support the steps taken thus far through code modifications, the Energy Networks Association' Open Networks Project and directly by Ofgem to improve the visibility and transparency of assets connected on the networks.

We welcome the introduction of an asset register. This will provide the DNOs, the ESO and market participants with greater visibility of the types of assets connected to the network. This information should be available alongside current and future network constraints. This information will allow assets to be located optimally and provide flexibility services where needed. This register should include information around Loss of Mains protection.

However, even if this information is updated regularly, it only provides information of what is connected and its location. It does not provide information on its generation profile.

To aid the management of the system and ensure security of supply, DNOs must ensure that they have real-time monitoring of their networks. DNOs should know the available capacity on its network and on a real-time basis know how close to these limits each part of the network is operating at. DNOs should advise Ofgem on the information that they require to manage their network. With the proliferation of electric vehicles and heat pumps, it would be prudent to monitor the network down to the Low Voltage. These data should be presumed open. This will allow DNOs to optimally use their networks to connect more assets to the network, allow the use of flexibility services to optimise the network and therefore minimise network reinforcement.

From our Cornwall Local Energy Market programme, we identified key data that are not readily available, which we believe are needed to enable flexibility markets and allow platforms to deliver:

- **Available capacity on the network.** In order to make sure all contracts are grid-secure and contracts with the ESO do not jeopardise the local network, available capacity needs to be forecast and known throughout the distribution network. This is key for efficient flexibility procurement and is not provided by DNOs at this time.
- **Network Hierarchy.** DNOs have a default view of the network hierarchy (i.e. parent/child relationships between primary substations to Bulk Supply Point). However, abnormal running arrangements need to be identified otherwise congestions cannot be accurately resolved. DNOs need to have an accurate, up-to-date network hierarchy to enable flexibility markets to manage local issues.
- **Customer to network mapping.** Asset location needs to be accurately mapped on to the network. This needs to be streamlined as much as possible.
- **Sensitivity Factors.** To optimise the available resources, the power flow relationship between substations needs to be known. For the Cornwall LEM project we assumed a radial network, therefore a resource can either fully meet a congestion or not, (equating to a 1 or 0 sensitivity factor). Providing a sensitivity matrix would allow this to be known by the clearing algorithm.

Information should be fed in to the ESO in real-time, ensuring they have knowledge of potential flows at Grid Supply Point (GSP).

The ESO needs to have as much visibility of the real-time flows on its networks. We would expect the ESO to advise on the parameters it requires from DNOs for each GSP and the frequency at which it would need the data.

We believe that these data would better enable the DNOs to properly understand their networks, increasing market-based local flexibility procurement and allowing networks to be used more efficiently. This will allow a greater number of demand and generation assets to connect.

Centrica Business Solutions has been working with Distribution System Operators (DSOs) in continental Europe to leverage our existing power sensor technology to provide monitoring to DSOs. These sensors are established technologies that we regularly use with business energy customers to analyse energy use. This is something that we could explore further to provide monitoring to DNOs in GB.

Additionally, as more 'Internet of Things' (IoT) assets connect in the home, Centrica Business Solutions is leveraging the data from our IoT connected residential devices that could inform the DNOs of a real-time view of the grid state or for more advanced features such as phase-identification and topology reconstruction. This information of local voltage (and other parameters) could provide valuable information to the DNOs, as part of a contractual agreement.

Greater real-time visibility of specific assets connected to the distribution network

We believe that the focus from Ofgem should be on ensuring that DNOs monitor their networks at all voltage levels and ensuring that these data are shared in a timely manner with the ESO.

However, if Ofgem, the ESO and the DNOs believe that further visibility of specific distributed assets is required, this would need to be justified from a cost versus benefit viewpoint.

Ofgem could consider requiring distributed generation to provide a regular data feed to the ESO. This would allow the ESO to see the current generation profile of these assets. This could be further augmented with distributed generators providing regular forecasts on generation profiles.

Ofgem should consult further on how these data should be provided, but we strongly believe that it should not be overly prescriptive. For example, Centrica currently has monitoring software and hardware capability that we would look to use to provide these data. It would be inefficient for Centrica to be required to install different monitoring equipment for this purpose.

Using common industrialised (including 'Industrialised Internet of Things') protocols and interfaces that are commonly installed on generation assets control systems should be considered in any proposals. There are learnings to take from the ESO, for example in their work to bring forward 'Wider Access' to the Balancing Mechanism. Such solutions could be leveraged, but would need appropriately adapting (e.g. sample rate, clear operational metering guidance) to enable widespread, standardised deployment. We have previously worked with the ESO on such solutions and would be willing to collaborate to assist in the process of developing solutions to enable real-time monitoring.

We believe that the focus should be on standalone distributed generation. Introducing such a requirement to behind-the-meter assets would be much more onerous at this time.

Lowering the threshold for Physical Notifications

At present, the ESO has visibility of larger generation assets through Final Physical Notifications. This applies to power stations above 50 MW in England and Wales and the thresholds are lower in Scotland. Such assets may also participate in the Balancing Mechanism.

Ofgem should consider the impact of lowering the threshold requiring assets to provide Final Physical Notifications, from the current 50 MW in England & Wales to a lower level. Scotland, England and Wales should have aligned definitions. We note that this is being considered in Grid Code modification GC0117. Ofgem should explore the impact if a threshold reduction is applied to new assets only or also existing assets.