SP ENERGY NETWORKS

Network Planning & Regulation

Your ref

Our Ref

Date

27/11/2017

Contact / Extension

Gerry Boyd
0141 614 1789

Andrew White
Ofgem
9 Millbank
London
SW1P 3GE

Dear Andrew,

SP Energy Networks Response to Ofgem Consultation on "Enabling the competitive deployment of storage in a flexible energy system: changes to the electricity distribution licence"

This response is from SP Energy Networks (SPEN). SPEN is the networks business of Scottish Power and holds three electricity network licences. We own and operate the electricity distribution networks in the central belt and south of Scotland (SP Distribution), which serves two million customers, and Merseyside and North Wales (SP Manweb), which serves one and a half million customers. We also own and maintain the electricity transmission network in the central belt and south of Scotland (SP Transmission).

We fully support the Government's commitment to a smarter, more flexible energy system which can bring significant benefits for both consumers and the general economy. We are therefore happy for Ofgem to publish our comments on the Ofgem website to share our views on Electricity Storage with the wider stakeholder community.

We understand the importance of being able to balance network security, affordability and environmental impact – the energy trilemma. The move away from large, centralised generation and control towards a more localised energy system with distributed energy resources (DER) such as wind, solar and storage, combined with the decarbonisation of transport and heating through the use of low carbon technologies such as electric vehicles and heat pumps requires significant changes to the way we think about our energy use. For instance, the growth in renewables will need a shift in thinking away from having solely demand-led generation towards the need to also have some generation-led demand. The growth of the "prosumer" and recognition of self-consumption are examples of this shift already taking place.

We believe that distribution network operators have a central role to play and are leading the initiative towards the DNO transition to become a Distribution System Operator (DSO). The role of system balancing can no longer be considered to be solely a centralised function. System balancing needs to be incentivised to take place within all levels of the distribution network to ensure that the task of balancing the system at a national level is achieved at lowest overall cost.

SP House, 320 St Vincent Street, Glasgow. G2 5AD

Telephone: 0141 614 0008

www.spenergynetworks.co.uk

Future balancing will potentially involve storage in a number of ways including:-

- behind the meter – prosumers matching their generation and demand in real-time both directly and through the use of storage
- co-located with generation – generators, especially renewables, will need to store their output to better match times of demand
- dedicated network connection – to better manage the peaks and troughs in electricity generation and supply, thereby making better use of existing assets and reducing the need to expand the network.

Electricity Storage connected to the distribution networks is one method of supporting local and national balancing requirements, but should be considered alongside other smart solutions and conventional reinforcement, with the lowest overall cost solution being deployed.

Improving the balance of generation and demand at the local level has the potential to significantly reduce the cost of balancing the system at a national level. Electricity Storage connected within distribution networks is one of the ways of achieving this. We believe that including the three sub-classes of storage described above in the licence definition will enable fine tuning of regulatory incentives in the future, as the relative importance of storage in the day-to-day operation of the system increases.

Please do not hesitate to contact me should you have any queries in relation to our response.

Yours sincerely

Gerry Boyd
Distribution Commercial Innovation Manager
SP Energy Networks

APPENDIX 1: Responses to relevant Ofgem Consultation Questions

Question 2.1: Do you agree that the proposed new condition will ensure legal unbundling of DNOs from the operation of storage that benefits from an exemption to hold a generation licence?

We agree with the classification of storage as a sub-class of Generation in the short term as this provides formal recognition of storage and can be implemented relatively quickly, without the need for changes in primary legislation. However, we believe there are sufficient differences between generation and storage for Ofgem to consider options for the longer term which may ultimately require changes to primary legislation. For example, Generation is primarily about the mass production of electricity units, whereas Electricity Storage is more about added value Electricity System Services – as typified by the emergence of the concept of flexibility. We believe one such option for the longer term could be a new, separate "Flexibility" asset class, with Electricity Storage being a subclass of Flexibility, along with other subclasses such as Demand-Side Response.

The DNO will need to have some form of direct control over storage system operation, as it does currently with embedded generators that are operated via constraint management schemes using active network management. This is because of the necessarily complex technical performance requirements of storage systems compared with typical conventional embedded generation. For example, the performance requirements to provide National Grid's "Enhanced Frequency Response" is very different from a typical license-exempt embedded generator, who is typically not required to give any consideration as to where their exported energy goes. Furthermore, a storage system that only has to perform a single application can be complex enough, but the complexity will increase as storage system operators strive to combine revenue streams from multiple applications. This complexity alone is a major barrier to market entry.

Whilst dependent on the relative scale of an embedded storage system and the actual function being carried out, it is nonetheless anticipated that the operation of storage systems connected to distribution networks will require a close operational relationship between the DNO (or future DSO) and the storage system owner. It may be possible in the short term for network operators to provide relatively wide operational envelopes for the initial wave of storage systems, giving the storage owner the freedom to explore various market opportunities. However in the long term it will be the effective management of network constraints (and how storage can be used to minimise those network constraints) that will govern the economic viability of storage.

The speculative nature of storage applications to date has also resulted in network capacity being sterilised through contracted storage projects, which do not have firm plans to progress until such time as they can secure sufficient revenue streams through the ancillary services market (e.g. FFR tender from UK SO). This is counter to Ofgem/BEIS views on how storage can help to balance the network and free up network capacity, but is a behaviour that will need to be closely monitored and discouraged moving forward.

It should also be noted that in the absence of DNO/DSO co-ordination, storage can actually have a negative impact on the network rather than the positive impact that the technologies could ultimately provide. It has been our experience that developers will seek the maximum leeway within their connection applications in order to maximise their potential revenue streams. This means that DNOs are required to design connection solutions that can cater for all possible outcomes of storage system use. Greater certainty is required by DNOs on how developers plan to use their storage systems in order to minimise costs for those developers and any UoS impacts associated with storage connections. This will impact wider customer costs in instances where there is a network fault level impact: part of the costs will be borne by the developer, with the remaining costs being socialised through UoS charges. The percentage borne by developers is typically low as they only pay a proportion of the new system capacity based on their contribution to fault level.

Question 2.2: Do you agree that the same principles of unbundling should apply to IDNOs? Do you have any views on the application of the specific new condition proposed here applying to IDNOs?

Yes, the same principles that are applied to DNOs should be applied to IDNOs.

Question 2.3: Do you agree that DNOs should be able to directly own and operate small-scale storage for the purposes of providing uninterruptible power supplies (UPS) at substations? Do you agree that DNOs should be able to directly own and operate small-scale storage for the time-limited purposes of emergency restoration and maintenance? Do you think DNOs should be able to directly own and operate storage for any other specific applications?

It is a long-standing practice for DNOs to use batteries and/or small standby generators within certain substations to back up the electrical supply to DNO-owned equipment within those substations, and it is important to distinguish this function and exclude it from the functionality that this proposal is looking to exclude from the DNO licence. Substation back-up supplies are a critical element of our network resilience both under normal operational conditions and during significant events, such as black start, and must be excluded from these licence change proposals.

Whilst it is not current practice within SPEN to use batteries for emergency restoration and maintenance (we currently use mobile generators for this purpose), it is likely that the use of hybrid mobile generator/battery units will become an option in the near future.

In both cases (UPS and emergency restoration and maintenance) we agree that DNOs should be permitted to own storage. In addition to post-fault restoration and pre-outage maintenance situations, generators may also be deployed in certain pre-fault situations (e.g. in anticipation of a fault, where the impact of the fault would otherwise be high), so the application of storage in pre-fault conditions should also be included within the exception.

Question 2.4: Do you have any views on the treatment of existing islanded system generation currently owned by DNOs? Do you have any views on the treatment of future use of DNO owned and operated generation of storage in similar island situations?

In order to be consistent, the new licence conditions should apply equally to islanded and mainland storage sites. We do not believe that any of the existing island systems should be treated as a special case within the new licence condition, but rather should be subject to time-limited licence derogations, with a view to achieving full compliance within a reasonable timeframe.

We also note that Ofgem describes the existing storage systems operating on islanded networks as “long-standing arrangements that have worked well for consumers” and we wonder whether there may be a case that such arrangements could also work well for mainland customers, i.e. whether DNO operation of storage in analogous situations might be good for customers and could be allowed to co-exist with commercial storage operation. To achieve this would clearly require appropriate regulatory controls to be put in place.

Within our response to the Ofgem/BEIS Call for Evidence on Flexibility we outlined that DNOs should be able to own storage in instances where there was a demonstrable benefit for our customers but insufficient market interest to deploy generation. We still believe this should be an option but recognise that such schemes would require ongoing derogation and review to identify if/when market participants could fulfil the requirements.

Question 3.1: What are your views on the three high-level criteria proposed as the basis for assessing applications for consent? Do think there are other criteria which should also be included?

We believe that the proposed criteria set the bar high for DNO ownership/operation of storage, making the option of DNO ownership an exceptional arrangement. However, as evidenced by the UKPN “Smarter Network Storage” project, a close working relationship between the DNO/DSO and the storage provider may be required in order to maximize the operational performance and minimize the operational risks of the storage facility.

Question 3.3: Do you have any views on the process that should apply to the assessment of applications?

The suggested process is consistent with the objectives as stated by Ofgem and so we have no comments on these.

SP House, 320 St Vincent Street, Glasgow. G2 5AD

Telephone: 0141 614 0008

www.spenergynetworks.co.uk

Question 4.1: Do you have any views on reporting requirements for DNOs that own/operate storage assets?

The suggested reporting requirements are consistent with those that already exist for related areas and so we have no comments on these.

Question 4.2: Are there any particular types of data that, if published, could facilitate entry of competitive parties? Is there any other information or data that you think DNOs hold about the deployment of storage on their networks that they could usefully make public?

For traditional new connections, available network capacity is initially communicated to prospective connectees in the form of high level heat maps, which give an idea of the level of local network capacity. New connectees are generally looking for areas of the network that have available capacity and are free from constraints, meaning that reinforcement costs would not be incurred. But if storage is to be able to add value to distribution networks, and unlock the untapped potential, it has to be able to facilitate the connection of load and generation as an alternative to conventional reinforcement – in typically what we describe as Dual Constrained Networks – networks that are considered "full" from both a generation and demand perspective. This is a totally different proposition to the traditional connection process, requiring much liaison and co-ordination by the DNO/DSO between prospective and existing demand and generation customers as well as prospective storage system developers. This co-ordination activity has significant resource implications on all parties.

Developers have requested 'storage' heat maps outlining network areas best suited for the application of storage facilities. This would be a positive step forward and we are investigating the possibility of doing so, however it should be noted that providing an up to date partly automated heat map for storage is significantly more complex than outlining available network capacity. The advantage to this approach is that this information would be publicly available and mitigate the risk of DNOs providing potential commercial advantage to parties on a bi-lateral basis, e.g. inquiries into 'where is it best to locate storage to provide a service to the DNO'.

A first-pass assessment can be carried out by DNOs to identify likely areas which have the potential to benefit from storage (i.e. load centres containing significant generation) – we have identified two such areas in each of our two distribution license areas. Additionally, stakeholders can also suggest locations, based on their own assessments of our network heat maps. Following on from this, stakeholder events have a role to play in bringing interested parties together. This information, including stakeholder feedback, can then be used to develop formal expressions of interest and invitations to tender, which would involve the exchange of more detailed project-specific data and information.

SP House, 320 St Vincent Street, Glasgow. G2 5AD

Telephone: 0141 614 0008

www.spenergynetworks.co.uk

Additional Comments:

It is important to recognise that in order to:-

a) increase the proportion of energy delivered to customers from embedded renewable generation;
b) accommodate the uptake of electric heating and transport, and,
c) avoid major infrastructure expansion,

Dual Constrained Networks will necessarily become more prevalent. In the longer term it is these types of network, with significant constraints, that will provide the appropriate pricing and locational signal that will test the economic viability for storage, as an alternative to conventional reinforcement.

Realising the full potential of electrical storage connected to distribution networks will require a quantum shift in thinking for all parties involved – DNOs, the NETSO, generators and demand customers. Electricity storage clearly also represents a major challenge for the Regulator. In the old paradigm, generators sought the lowest cost connection (i.e. utilising existing capacity on the network) and did not need to consider where their generated electricity would go once it passed through the export meter. This approach is not sustainable if the proportion of energy supplied to customers from renewable forms of embedded generation is to increase.

Whilst the current focus for electricity storage is on the high added value ancillary service markets such as EFR and FFR, the true value of storage will only be realised when it is able to offer an alternative to conventional reinforcement in situations where networks are dual constrained (i.e. constrained from both a generation and a demand perspective). This is a challenging goal, something that has not yet been demonstrated, even in the innovative UKPN Smarter Network Storage project. The changes to the generation and DNO licenses proposed in the two related Ofgem consultations do not address these needs.

In order to nurture a future where storage is located to provide maximum benefit to the UK SO, local DNOs and ultimately to end consumers, a clear and transparent market for services must be in place. Whilst this is true for transmission services, no such market, products or services are defined for the distribution network.

SP House, 320 St Vincent Street, Glasgow. G2 5AD

Telephone: 0141 614 0008

www.spenergynetworks.co.uk