Ofgem consultation into 'Clarifying the regulatory framework for electricity storage: Licensing'

A submission from Eaton
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Overview

This paper sets out Eaton's response to the Ofgem consultation, 'Clarifying the regulatory framework for electricity storage: Licensing'. We welcome the steps set out in this consultation and in the recently published response to the call for evidence on a Smart, Flexible Energy System. However, we would highlight concerns around the decision to classify storage as a subset of generation, and believe that a more nuanced approach is needed. This is vital to ensure battery storage is able to realise its full potential as a source of very fast ramping flexibility - both at grid scale, but also crucially behind-the-meter, which the U.K. energy system will increasingly need in the future.

In partnership with the Renewable Energy Association, Eaton recently commissioned Bloomberg New Energy Finance (BNEF) to develop an economic study *'Flexibility gaps in future high-renewable energy systems in the UK, Germany and Nordics' (published on November 14, 2017)*.The study found that economic tipping points mean renewables will account for half of the UK's electricity generation by the mid-2020s. This rapid growth, driven predominantly by increased variable renewable generation (wind and solar) will lead to much greater volatility in the UK's power system, challenging inflexible 'baseload' generators and creating an urgent need for new sources of flexibility, in particular battery storage.

The need for this flexibility will be driven by a significant increase in extreme system volatility events as the share of variable renewables rises. What is most striking from the BNEF study is how fast this change will occur – by 2030, the highest ramp-up is around 20GW/hour and the highest ramp-down is 24GW/hour (compared to 10GW and 11GW respectively in 2017). This corresponds to around 40% of the current U.K.'s gas, coal, and nuclear plants turning on or off in just one hour.

The BNEF study also shows numerous periods with 100% renewables, that is with little inertia on the grid. In such situations, large quantities of self-reacting storage (measuring the frequency and reacting in a few milliseconds to compensate for surging or sagging frequency) will be essential to provide synthetic inertia and therefore maintain the stability of the grid.

The BNEF modelling shows that new storage capacity with a duration of four hours or more would reduce the need for back up capacity by 20 per cent, for example, and increase the efficiency of the remaining back up capacity by a similar amount. These increased ramping requirements could be an opportunity for newer technologies such as battery storage which can alter their states (either generation or consumption) without major cost implications and also far faster than traditional sources of flexibility such as gas.

However, according to BNEF's modelling, storage attached to behind-the-meter variable renewable generation assets remains uncompetitive even by 2040, unless potential additional

revenue streams can be unlocked. This is where changes in the regulatory framework proposed in this consultation can play a significant role, and we provide some specific recommendations in this regard to Ofgem's questions below.

Eaton recognises that classifications and regulatory categorisation are less important that final outputs and policies; regardless of the approach, the creation of a firm definition will stimulate the development of a vibrant and open UK energy storage market.

Question 1: Do you agree that the form and content of the license as proposed in this consultation will achieve the purpose and deliver what we committed to in the Smart Systems and Flexibility Plan?

Eaton recognises the expediency in classifying storage as a subset of generation. This will resolve some of the most pressing issues that are currently holding back the development of a vibrant domestic market for energy storage in the UK, such as double charging on assets and a lack of legal certainty.

We strongly support the development of the industry and wish to constructively add to debate. However, the classification of storage as a subset of generation is highly problematic because storage factually does not generate power; it provides a multitude of what will be increasingly vital flexibility services – both at grid level and behind-the-meter, close to where renewable generation assets such as solar will increasingly be located, as demonstrated by the data in the BNEF study referenced earlier.

The classification of storage as a subset of generation may be fit for resolving the regulatory issues of today. However, the urgent need to unlock the full range of flexibility services that storage can provide means that this classification is already not fit for purpose and needs to be resolved urgently given the speed of the shift to a high variable renewable energy system. It also focuses on grid-connected storage, but overlooks the reality that behind-the-meter storage will increasingly be by far the most important contributor of system flexibility in the future – a fact also borne out by the BNEF study referenced earlier. If this definition goes ahead as planned, Eaton would urge Ofgem to keep it under constant review and remain alert to new regulatory barriers which may emerge as an unintended consequence.

This will be especially necessary to unlock the potential services and associated revenue streams that would make storage economically viable for behind-the-meter applications, both for residential and commercial users. The proposed reform misses out on a range of consumption-oriented applications of energy storage. This limits the case for storage by curtailing the legally recognised value of the asset.

A potential solution to this issue might involve multiple classifications for storage technology, possibly including a generation license, but also a multi-purpose license, which could include non-generation uses. This might involve the storage operator making an annual declaration regarding the intended usage of its storage assets. This would recognise the range of services and associated benefits that storage can provide, rather than straightjacket it into one application, to the detriment of others.

We also have concerns about storage having exemption from the Final Consumption Levy where self consumption is not the primary use case. We believe this makes sense for front of meter applications, but could be detrimental to behind-the-meter commercial and industrial use cases where self consumption will almost certainly be a part of the business case. It will be vital to develop a definition that allows for all services to be fairly compensated and prevent commercial and industrial users being penalised.

Question 2: Do you have any views on whether we should include 'in a controllable manner' in the definition of electricity storage?

Yes, because this is the essential nature of energy storage. This sector is unique in its ability to store and redeploy energy on demand, which is what makes energy storage a potentially transformative technology. If the definition is being reconsidered, Eaton would like it to go further. The current definition, while welcome, does not effectively capture what energy storage is or does. The more regulatory certainty and recognition provided, the more the industry will benefit.

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It is, however, difficult to accurately capture a definition of storage without being too long or prescriptive. Eaton supports the development of a robust definition and welcomes Ofgem's attempts to do so.

Question 3: Do you think there are any risks or unintended consequences that could arise as a result of our proposal? If so, please provide an explanation.

Eaton recognises potential for unintended consequences of these reforms, of the type outlined in the answer to Question 1. The proposed definition has the potential to curtail the potential uses of energy storage and prescribe its uses through regulation, in a way which overlooks the many potential behind-the-meter applications of the technology and focuses solely on grid-connected uses which in future will only form a very small part of the potential flexibility services that battery storage will provide.

Grid-connected uses are currently the most well-developed applications for storage. These include storage facilities providing flexibility, in conjunction with other energy generation facilities. This is clearly the key application considered in the context of the proposed definition.

However, the proposed definition would limit the value of storage for grid-connected assets. It would mean that they can only operate as generation assets. For example, a DNO, to delay implementation of a substation upgrade, may invest in storage, to manage peaks in demand. The costs of this investment would be passed on to the consumer. However, if the DNO is able to use storage for a range of purposes other than generation and is able to sell to other stakeholders, these costs are mitigated. Eaton would thus urge Ofgem to consider the full potential range of uses of storage, and how regulation can help realise them.

Moreover, future innovations and cost reductions in battery technology will mean that storage is more accessible to domestic consumers, for behind-the-meter uses. The proposed license may disincentive development of a market that would enable the development of these applications, or make it uneconomical to do so.

As mentioned before, the BNEF study highlights the huge potential of the flexibility provided by behind-the-meter storage to be traded in ancillary services markets by aggregators. This would unlock additional revenue streams for residential and commercial owners of these storage assets that would make them far more bankable. However, the proposed definition as it currently stands would not support the development of such a market.

In summary, Eaton takes exception to storage being defined as only a special case of generation. It may be acceptable for large scale storage that is directly connected to the high voltage grid and thus likely co-located with other generation. However, if located in the distribution grids, potential use cases may be limited by this definition. For example, if storage is used to defer or avoid investment by handling a peak problem in the distribution grid, it should not strictly be classified as generation. For example, if local distribution infrastructure is unable to handle peak loads, it may require lengthy or costly upgrades. If storage was to be deployed in close proximity, this could solve this problem in a cost-effective way, storing power from low demand times and supply during the peaks. Such a use does not involve generation of electricity.

To address this conundrum, Ofgem could consider a different definition altogether for behind-the-meter storage. This would allow for self-consumption, and in aggregate or scale cases, such systems could be included to participate in all “market based” grid services. This behind-the-meter storage definition would only require specifying the level of power which is permitted in demand response, frequency regulation, and so on. Moreover, this would incentivise more storage to be deployed behind-the-meter, which combined with universal smart meter deployment, will incentivise behaviour and which supports the grid and will ultimately lower costs. This will provide a very strong value proposition without the need for incentives or confusion in the market.

Question 4: Do you have any comments on the list of technologies that should be included or excluded from the definition of storage as set out in Appendix A?

Eaton supports this list, as an indicative, rather than exhaustive, list of technologies. Moving forward, it will be essential to create on open, competitive regulatory environment, which would not benefit from prescribing particular technologies involved in licensing reform.

Contact

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