



Ofgem consultation into 'Enabling the competitive deployment of storage in a flexible energy system: Changes to the electricity distribution license'.

**A submission from Eaton
November 2017**

Overview

Eaton specialises in a range of power management technologies, including energy storage, at grid and behind-the-meter level. As such, rather than responding to each question in this consultation, we feel it would be more appropriate to submit a more brief summary of our positions on DNO licensing.

General comments

Eaton welcomes efforts to make the electricity market more open and competitive. There are a number of regulatory and legislative mechanisms which currently obfuscate natural market forces, and Eaton supports attempts to remove them. Eaton favours a regulatory regime which exploits the full range of potential uses for energy storage, in an open and competitive way. Such an approach will ultimately encourage innovation and benefit consumers and business.

There is an important distinction regarding the DNOs' use of storage, which should be factored into potential reforms. If DNOs simply use storage to protect the grid and ensure resilience, particularly through the deployment of storage to mitigate peaks in demand, there is no reason that this usage should be curtailed.

The use of storage becomes problematic when DNOs compete with other actors in competitive situations, for example through bidding for flexibility contracts. This would, as the consultation suggests, be an abuse of a market monopoly and hold back the development of a vibrant domestic energy storage marketplace.

Eaton would warn against any regulatory reforms which could limit the range of functions for which storage can be used. 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. It is also essential to recognise that storage cannot be run independently from the Grid, especially when resilience and flexibility are the objectives of regulation.

If the licensing regime is to be unbundled, the likely consequence would be that DNOs continue to own storage assets, but subcontract operation of these assets to a separate company. This would be the most economical way to use storage, that would comply with new regulation. If an exemption is to be granted where there is no viable market alternative, it will have to be effective in ensuring that DNOs focus on their primary function of operating distribution networks.

Alongside the unbundling of the license, Eaton would support more open and transparent publication of data, on issues including potential functions which a market mechanism could replace, and the value of the assets to be replaced. This would support the entry of a multitude of players into the market, thus driving up standards, reducing costs and encouraging the development of a domestic storage ecosystem and industry in the UK

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.

Finally, Eaton is aware of a number of voices beginning to call for charges on self-consumption of energy storage, in response to difficulties financing grid upgrades. Eaton strongly argues against any such actions. As demonstrated in the recently published BNEF economic study, the UK energy system will need as much flexibility as possible in years and decades to come to cope with ever growing levels of variable renewable generation. The future demand for volatility is certain and well-established, deriving from the built-up of renewables already contracted or confirmed, and therefore the need to rapidly build-up flexibility is proven.

On the other hand, the same study demonstrated that the proportion of total energy generated on-site will remain marginal in the UK due to its relative lack of insolation, resulting in a very marginal proportion of self-consumption in the overall electricity market. "Taxing" self-consumption would strongly disincentivise adoption of flexibility assets thoroughly needed in the near future, to correct a problem that is likely to prove almost non-existent for decades in the UK. A more positive alternative to grid financing could be a cost of connection to the grid priced by

size (akin to a broadband connection fee priced by speed) guaranteeing steady revenue streams for the grid, coupled with lower / non-existent residual charges that would encourage energy prosumers while asking a consumer with large flexibility capacity (e.g. a household with 2 EVs, PV and storage) to pay for a larger, more expensive grid connection if they want to maximize profits to be generated from providing flexibility and stability services to the grid.

Contact

If you would like more information about any of the points made in this submission, please contact Jonathan Dinkeldein on JonathanDinkeldein@eaton.com or by telephone on 01753 068 792.