

# Energy storage post-Brexit: how will it fare?

Potential delays, power shortages and investment challenges arising from the UK's combination of nuclear policy, the capacity mechanism, the Renewables Obligation scheme and the Contract-for-Difference (CfD) clearly demonstrate a need for new technologies like storage. Collaboration will be key to unlocking its full potential.

**Lis Blunsdon and Edward Humphries**

Nearly a year on from the referendum, it is still difficult to assert with any confidence what direction the UK's energy sector will take post-Brexit.

One thing we do know is that when the UK leaves the European Union, it will also leave the European Atomic Energy Community. This will pave the way for complicated bilateral negotiations with other nuclear powers, and leave the UK's newly re-awakened nuclear generation industry in uncharted territory. At best, we can expect some delays in the deployment of new nuclear plants.

Another "known" is that the government's capacity mechanism is failing to produce high enough prices to ensure investment in new build gas fired plants. This leaves us with an ageing thermal fleet of generating assets with very few replacement options on the horizon.

We also know that as of 31 March this year, the Renewables Obligation scheme (which has supported the development of renewables projects in the UK for the last 20 or so years) will, bar a few very limited exceptions, close to new applicants.

Meanwhile, the mechanism that replaces the Renewables Obligation scheme – the Feed-in-Tariff Contract for Difference (CfD) – is far from as prolific as was originally hoped. The plan was for an annual allocation round; however, the first one took place in 2014, and we are only just now seeing the start of the second. If the rumours are to be believed, the second round may also be the last.

The government's energy policy over the last decade or so has focused on the "trilemma", namely how to balance security of energy supply, energy affordability and decarbonisation. In its recent green paper 'Building our Industrial Strategy: Green Paper, January 2017' (the Strategy Green Paper), the government stated:

"On Climate Change, the settled policy position is reflected in the government's commitment to meeting its legally-binding targets under the Climate Change Act. How we

will continue to meet our legal obligations will be set out, as required, in the forthcoming Emissions Reduction Plan. [...] This means that in the years ahead, two important areas of energy policy require a higher priority: the affordability of energy for households and businesses, and securing the industrial opportunities for the UK economy of energy innovation."

Is this an indication that de-carbonisation is taking a step into the shadows while affordability and innovation step into the limelight? There has been much furious Tweeting from the government to the effect that its commitment to carbon reduction remains strong and centre stage. However, renewables subsidies have been reduced significantly, and the sector is acclimatising to a brave new world without them. With a shift of priorities and a largely subsidy-free renewables sector, does a focus on innovation mean that there is now a new sense of direction in the energy sector?

One area where there has been significant interest is the development of energy storage – particularly batteries. Ironically, one of the driving forces behind the stellar development of energy storage in California (currently the storage sector's poster child) is the practical issue posed by the increasing deployment of intermittent renewables.

Intermittent generation can present problems to grid operators who are trying to balance the overall system at the least cost. Ideally, there should be back-up generation available at all times to cover sudden drops in wind and solar output. However, keeping large-scale thermal assets that were designed to run as base load ticking over on the off chance that the weather deviates from the forecast is neither economical, nor very helpful in limiting carbon emissions.

Energy storage can help to smooth out these fluctuations, and can also be used to provide very fast (sub-one second) frequency response services. National Grid's recent Enhanced Frequency Response (EFR) tender resulted in the award of eight contracts to provide 201 MW of this type of capacity, all of which is coming from batteries.

The Strategy Green Paper identifies ten pillars on which industrial strategy is to sit, one of which is "delivering affordable energy and clean growth". Moving the energy portfolio out of DECC and into the newly created Department for Business, Energy and Industrial Strategy (BEIS) is described as being part of this process. An Industrial Strategy Challenge Fund will also be established, in part to explore the development of smart, clean energy technologies such as storage and demand response.

At the same time, the government has appointed Sir Mark Walport, the recently appointed Chief Executive of UK Research and Innovation (UKRI), to conduct a review as to whether there should be a new research institution to act as a focal point for work on battery technology, energy storage and grid technology. His findings are due in 2017.

The Second Allocation Round for

CfDs has a new set of terms and conditions that refer to energy storage facilities (a definition that is not limited to batteries). The consultation that preceded this addition was couched in terms of allowing energy storage to take part in the CfD process.

The drafting that has actually been published switches the position around. It provides that generators may not include a storage facility in a CfD project unless the facility has a separate Balancing Mechanism Unit associated with it and it is only charged using electricity from the facility that is the subject of the CfD. This makes sense from a subsidy point of view, as it means that only renewable energy is being stored (the facility has to be a qualifying renewable generator to be eligible for a CfD in the first place). It does however restrict the deployment of energy storage that qualifies for a CfD to co-located facilities, and does not provide support for storage per se.

So, energy storage is definitely on the government's radar, but is that enough to enable it to fulfil its potential? It's certainly a start, but the constant refrain from the industry over the past few years has been that the government needs to deal with the regulatory aspects of storage projects in the UK if large-scale deployment is to become a reality. Storage doesn't need government subsidies in order to develop, but it does need a clear, straightforward regulatory framework and sufficient comfort that storage will be part of the government's energy strategy in the future.

Part of the problem is that in the UK there is no clear classification of what storage is. Historically, to the extent that it has been categorised at all, it has been seen as generation, but storage does not fit well into the definition of generation under the Electricity Act. While it has some features that are similar to generation it has many others that are not.

Storage can perform multiple physical and commercial functions and part of the problem is how to capture the benefit of this versatility. Commentators talk of "stacking" benefits – by which they mean being able to provide, for example, ancillary services, arbitrage power prices, network support and demand side reduction, all using the same kit (although not all at the same time!). There is no other technology currently in use on our electric system that has these characteristics and it seems logical that there should therefore be a separate licensed asset class to cover storage.

The contractual framework that allows for full commercial exploitation of storage assets is not yet fully defined. Contracts for the provision of services to National Grid can be an important revenue stream for generators, but there are currently restrictions in some of these contracts that means providing multiple services from a single asset can be difficult.

It was encouraging to see that storage projects were successful in the 2020/21 capacity auction, with 3.2 GW gaining 15-year capacity contracts. However, not all storage technologies meet the technical



**Humphries: storage will not reach its full potential as long as it lacks a classification of its own**

parameters under the current capacity mechanism (designed for generators, not storage) even though they could provide useful capacity at times of system stress.

The structure of the electricity market can also be a challenge. In recent years we have seen the unbundling of functions within the electricity industry, driven largely by competition concerns. This has meant that certain assets – most notably generating assets – cannot be held by distribution network operators (DNOs). For as long as storage lacks a classification of its own, it will not reach its full potential. Storage can be of great benefit to distribution network operators in balancing local fluctuations on the distribution system, often caused by intermittent generation, but cannot currently be owned by DNOs (subject to a *de minimis* threshold).

The potential delays, power shortages and investment challenges arising from this combination of nuclear policy, the capacity mechanism, the Renewables Obligation scheme and the CfD clearly demonstrate a need for new technologies like storage. Collaboration will be key to unlocking its full potential.

There have already been various government funded demonstration projects involving DNOs, universities and energy suppliers. The results of these test projects have been freely published and provide valuable, and sometimes surprising, insights into how best to collaborate and commercialise storage. Having the government behind further innovation as evidenced by the Strategy Green Paper, both in policy terms and in providing additional funding, can only be a good thing.

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