

REA Briefing on Government Call for Evidence on a 'Smart, Flexible Energy System', winter 2017

The Renewable Energy Association (REA) represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, investors, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are nearly 700 corporate members of the REA, making it the largest renewable energy trade association in the UK, including nearly 100 energy storage members, also making it the largest trade body for the energy storage industry.

Introduction: Why transition & The size of the prize

In November this year BEIS and Ofgem published their [Call for Evidence on a Smart, Flexible Energy System](#). This aims to set the legislative and regulatory framework for energy storage and a flexible energy system, by identifying the current barriers and blockages. We believe there are huge benefits from moving to a more decentralised, more flexible energy system. The National Infrastructure Commission's 'Smart Power' report indicated consumer savings of £8bn a year by 2035 from 4GW of flexible capacity including energy storage. Not only this, but the need to decarbonise our energy supplies to meet legally binding targets and the economic realities of how the market is moving. Our energy system was designed for large, centralised power plants moving electricity to cities using huge power lines. Such significant infrastructure could no longer be required as we move to a more flexible, distributed, clean and equally secure system.

This autumn the REA published its updated report, *Energy Storage in the UK, A Market Overview*, which provides a comprehensive introduction to the sector and the only database of energy storage projects in the UK market, identifying around 3.23 GW of current capacity. Based on this and further assumptions, we believe the UK could see 12 GWh of energy storage capacity installed by 2020 (based on installations co-located at renewables sites, connected to EV charging points, behind the meter at small scale, and larger, grid connected projects).

This represents the opportunity available but it is only with effective policy in place that it can be delivered.

Specific policy proposals & responses

The REA's members would like to see the following outcomes from the consultation:

- **Network charging methodology reform is vital**, and this should be via a full review of the grid charging mechanisms (a 'Significant Code Review'). Unpicking one single part of the code inevitably leads to skewing the whole charging system, leading to unintended consequences and over-rewarding. **The current threat to remove 'Embedded Benefits' represents a fundamental risk to the delivery of new, flexible energy capacity** such as storage and decentralised generation. BEIS and Ofgem are supporting the larger, centralised power plants in effect (by reducing the incentive to 'embed' locally on the localised electricity grid), when a move to new methodologies could unlock multiple advantages for the system and save billions

(identified by the National Infrastructure Commission as up to £8 billion a year by 2030 for example¹).

- To avoid double charging and legislative barriers designed for a different time, a **definition for energy storage is essential** (the preferred way of implementing this to be determined), and this should be implemented in a timely manner following some detailed discussions in the area already. In the longer term we believe this should be put into primary legislation.
- Government should consider enabling more innovative new energy system supply options such as local balancing through market platforms and local supply models which could cut costs of operating the system and accommodate more low carbon capacity. Linked to this is the move from Distribution Network Operators (DNOs) to Distribution System Operators (DSO) models, meaning potentially more efficient localised energy management. This could be enabled by a binding licence condition on the DNOs, and the enabling role of **the System Operator (SO), which must communicate better with the DNOs/DSOs and ensure new flexible capacity is tracked and quantified** to avoid being blindsided by new deployment. New deployment databases are required to track where the capacity is being installed.
- Due to their status as regulated monopolies, deploying assets to achieve regulated returns on capital without commercial competition for most of their functions, industry has competitiveness concerns regarding DNOs owning storage projects. DNOs are also currently subject to EU regulation preventing them putting power onto the electricity networks (the 'unbundling' of supply and grid ownership) meaning there is ambiguity over whether they can legally own energy storage assets. **DNO/DSOs should not be permitted to own storage assets unless a commercial provider has been sought but cannot provide the service in that particular location.** This is in line with the approach suggested in the EU 'Winter Package' of energy reforms (section 39). In practice this would mean the majority of storage projects delivered by the commercial sector using their expertise in developing commercial projects and bypassing the 'unbundling' operational restrictions on the DNOs.
- How 'system value pricing' can be ensured for market players in the short to medium term is at the heart of the likely future changes needed to deliver a smart, flexible energy system and approaches such as **'Pay for Performance'** in the East Coast US electricity market could provide this. This rewards assets that can respond quicker with higher payments as recognition that speed of response is an important element of providing capacity as much as the MW supplied. Without such price signals energy storage and flexible capacity is not able to deploy at scale as their services are not sufficiently monetised. Such a measure could be introduced in the Capacity Market for example.
- 'Stacking' revenue streams is vital to making energy storage projects viable. We and others have identified some barriers to existing schemes (eg the Enhanced

¹ National Infrastructure Commission, 2016, 'Smart Power', "...the saving [from flexible supplies] could be as much as £8 billion a year by 2030", p1, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/505218/IC_Energy_Report_web.pdf

Frequency Response (EFR) and Firm Frequency Response (FFR) mechanisms), proposing changes to the Capacity Market rules.

We propose that BEIS work with industry to cross check all contracts for services storage projects are eligible to apply for (this is in the region of 15+ contracts and therefore requires a concerted programme), to identify where any barriers to combining revenue streams exist and recommend ways of removing these.

- So-called ‘**Ancillary services**’ **must be reformed** – they are currently provided on an ad-hoc basis and some are not remunerated at all – these should be unified, streamlined (for example frequency response markets) and adequately rewarded (for example in the case of inertia). There is some industry led work underway on this at present which should be supported.

- **Reform of the Capacity Market is necessary**, the current flagship policy for ‘keeping the lights on’ could be better at supporting new, innovative flexible capacity. Encouragingly, the last auction saw two new-build storage contracts being awarded contracts for the first time. Reforms should put an emissions limit on new capacity, a ‘pay for performance’ type of approach and should consider specified supply duration thresholds, or changes to de-rating factors, for storage.

This is necessary due to the fact that exposure to considerable fines mean that existing ES projects struggle to gain financing for CM projects in a way that generation assets do not face (they can keep on generating given input fuel, whereas storage has a limited capacity based on discharge size). Provision of most services offered by storage means that it is optimal to build 6 hours or less of energy (MWh) output at full capacity for most types except flow batteries². The primary need for capacity is unlikely to be for more than 6 hours but if the period of system stress is initiated early in the day then storage may not be “available” under Capacity Market rules for the entire period as there is no ‘deadline’ stipulated on providing supplies into the mechanism. Whilst this can be managed by storage accepting a penalty this creates considerable unnecessary risk for storage and makes financing difficult to secure. **Therefore strong consideration should be given to stipulating time supply durations for energy storage and DSR projects, or changing the de-rating factors in the auction for storage projects**, so these projects know how long they would need to supply power for under a CM warning, and therefore how to size projects. Associated fines for non-delivery should be applied if projects do not meet the minimum required period of supply. Storage projects have no way of knowing how long they will need to supply power for without such information, meaning they risk oversizing their plants or not being able to receive finance because of the risk of non-delivery fines under the current arrangements, which could lead to inefficient over-sized storage projects at greater cost to the consumer and a loss of potential benefits to the system without this fast-responding capacity. Reforms should also:

- **Remove restrictions on ‘stacking’ revenues** for energy storage projects where appropriate - ie allowing these projects to receive income streams from multiple sources is necessary.

² For example charging for more than 6 hours and then discharging for 6 hours is unlikely to justify the additional investment. Also peak demand that causes the need for additional network assets is unlikely to extend beyond several hours per day so again the additional investment in more than 6 hours capacity cannot be justified.

- Storage projects could be further incentivised by allowing higher payments to value the premium flexibility service they provide (so-called ‘**Pay for Performance**’, as seen in the US PJM market) and additional services to the grid such as frequency response.
- **Smart tariffs should bring system benefits as long as the consumer impacts are fully considered.** Government should commit to the roll out of half hourly domestic and small commercial settlement by end-2017, which is a key enabler for smart tariffs for these groups- time of use tariffs will be a very powerful tool for unlocking flexibility capacity from these sectors and opening up the market, without any public subsidy. Smart tariffs should also assist in providing appropriate signals to reduce the stress on the system of anticipated widespread Electric Vehicle charging in the future.
- The delivery of energy storage provides a great opportunity for more renewables to be installed and therefore our energy system to de-carbonise, at lowest cost. With this in mind, **existing renewables support schemes should accommodate the co-location of renewables and energy storage** by allowing for separate metering and ensuring consistency in terminology and definitions across schemes. The REA has put forward proposals for how CfD strike prices could incorporate the system costs of different power generation forms and incentivise on-site storage (the ‘Market Stabilisation Mechanism CfD’- contact us for further details).
- At the large scale, there are several fundamental issues regarding **interactions between the various regional (currently ‘DNOs’, mooted to transition to ‘DSOs’) and national (TO to TSO) network operators**, which require careful consideration. The transition to DSOs will require robust pro-active regulation with the ‘stick’ and ‘carrot’ clearly visible to all potential DSOs. These could be in the shape of higher permitted earnings per unit (kWh) as opposed to earnings per regulatory asset base and on the compunction side a clear threat to DNOs that slow progress may result in them being forced to auction off distribution systems to new entrants or other DSOs that have already demonstrated that they can make the transition.
- So-called ‘**Behind the meter**’, **domestic energy storage** devices are gaining in popularity and help consumers maximise their on-site renewables consumption and lower bills – this sector needs consumer protection measures such as RECC (consumer best practice code)-accreditation for all installers and installation & operational standards and best practice (which the REA is working on at present). The findings of the ‘Every Home Counts’ low-carbon consumer protection review by the CEO of BRE should be implemented for the storage sector.
- The document also covers **Electric Vehicles (EVs), and their interaction with the wider energy system**. We believe the **interaction between EVs, energy storage and on-site renewables will be an exciting area of growth** (for example solar carports charging EVs, with onsite batteries and discharging to and from the grid will become more commonplace). Public education campaigns will help outline the best consumer measures and why consumers should participate in the market, alongside smart tariffs to provide price signals for charging (and in the future discharging) times. There is a great opportunity to turn EV storage into additional grid balancing and ancillary service benefits providing the software and technology is in place.

Finally, the call for evidence seeks views on future **innovation funding**. The REA believes storage and flexibility providers face the traditional ‘Valley of Death’ in UK

business development - innovation funding is supportive and industry acknowledges this and the success it has provided, but at the stage between widespread commercialisation of a technology and R&D funding, very little support is available and companies and projects can fail. More support is necessary at this vital stage for 'UK Plc' to gain the full investment and manufacturing benefits on offer.

The Green Investment Bank could for example consider taking such direct equity stakes as part of their investments. In addition, in overseas markets, local partner introductions, 'vetting' and logistical support would provide useful support for UK firms.

It is also important to invest in the systems and IT networks that go with the new flexible energy system business models and technologies. Vehicle to grid technology could be an area where the UK can steal a march on competitors and there could be scope for R&D funding for hydrogen applications- where the UK has some IP and industrial leaders. The same is the case for larger scale, 'high energy' storage such as compressed air and liquid air storage.

Next steps

The Government is now expected to consider the responses to the Call for Evidence and produce a plan for taking forward actions in the policy areas identified, in spring 2017. The REA strongly believe certain policy areas should be progressed as quickly as possible, and will work with BEIS and Ofgem to identify where this could be possible.

The REA would be happy to discuss the Call for Evidence and our response in further detail on request, please see the details below/in the accompanying email.

REA, January 2017

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