



Response to the Electricity Market Reform Consultation

Highview Power Storage

Summary

Highview Power Storage supports the Government's long-term objectives of security of supply, sustainability and decarbonising electricity generation in the UK.

While we recognize the role of interconnectors, demand side management, and indeed reserve fast response gas generation in delivering security of supply, we believe that energy storage is a key enabling technology that can help deliver all the objectives. Given the scale and complexity of the problem, no one technology will deliver the fix; we need a mix. Critically energy storage can help smooth out the increasing fluctuations in demand and supply that the grid will have to cope with as we change our generation mix, bring on localized generation, bring on Electric Vehicles and introduce demand side management, but without adding CO₂ or other emissions.

However, currently the market has insufficient incentive to encourage players to invest in or deploy energy storage and the current portfolio of untargeted qualifying generator incentive payments also removes part of the commercial opportunity for energy storage from within the market.

In summary we would recommend

- Feed in Tariffs become multiplicative on a temporal / demand basis rather than simply additive to the generation capacity with no regard to system demand. We believe that making FIT aligned to demand / supply would be a key change to help drive the delivery of the objectives of both energy security and decarbonisation. It would also likely give an improved 'ROI' on the subsidy or incentive payments.



- A capacity payment for energy storage so as to incentivise its deployment as an alternative to relying on high emission but inexpensive fossil fuelled plant to provide security of supply and manage the intermittency of wind and certain other renewable generation sources.
- Reclassification of energy storage (i.e. not grouped into generation asset class) so as to enable TNOs and DNOs to more easily own energy storage assets rather than be forced to buy their services.
- Consideration of how energy storage can be integrated with renewable generation assets for optimum capital and operating efficiency without negating their incentives.

We recognize that the arguments for the deployment of energy storage are not necessarily critical today. There is not so much wind or other intermittent renewables on the system such that their intermittency has a material, and unmanageable impact; gas and diesel fast response generation plant along with throttling large scale thermal plant provides cost-effective balancing and ancillary services. However, this review is about strategically planning for the future and if, as a nation, we plan to deploy high levels of both intermittent and must-run plant, energy storage will prove to be an economic way to maximise utilisation of our generation assets while ensuring energy security and decarbonisation.

Critical however, as many of the energy storage technologies are not yet fully developed (just as wind generation was 20 years ago), is to deliver the support and incentives in favour of storage commensurate to the growing portfolio of renewable and low carbon generation assets (e.g. wind, solar, EfW plant) so that it can be deployed in a timely fashion in advance of the urgent need. Without such strategic planning and investment, we shall be faced with the realisation and panic that low carbon security of supply solutions are not ready to be deployed once the requirement exists; necessarily seeing us fall back on existing or fast deployment fossil fuel plant.



8. What impact do you think the different models of FITs will have on the availability of finance for low-carbon electricity generation investments from both new investors and the existing investor base?

The amount of financial and regulatory support for renewable generation demonstrates an approach towards investment in the energy sector that is not technology neutral. Unconstrained continuous support for renewables moves away any interest for investing in other new low carbon technologies or for matching supply and demand. We believe that the EMR should provide sufficient financial support for all enabling technologies particularly storage, which are seen as significant contributors to the integration of large scale renewable generation into the system.

11. Should the FIT be paid on availability or output?

Feed-in tariffs with contracts for difference are designed to ensure continued investment and a stable return for investors in renewable generation as well as selected low carbon generation. Since a significant proportion of the large scale zero emission renewable generation is intermittent and hence not dispatchable, we believe that the FIT should only be paid on the generated energy. A further payment on availability rewards a capacity that does not offer firm power.

We would recommend consideration of one stage further, whereby FIT is stepped according to time of supply so that there is a real incentive to invest in a complete system to make intermittent energy dispatchable and specifically to enable it to meet peak demand. This will also incentivise must run plant to develop shape to its supply curve.

We believe that making FIT multiplicative on a temporal and demand basis rather than simply additive with no regard to system demand would be a key change to drive the delivery of the objectives of both energy security and decarbonisation.



22. Do you agree with Government's preference for the design of a capacity mechanism?

- **a central body holding the responsibility;**
- **volume based, not price based; and**
- **a targeted mechanism, rather than market-wide.**

A centrally administered, volume based targeted capacity mechanism is a suitable option to ensure availability of sufficient reserve capacity to balance supply and demand. However, a competitive tender structure in which all reserve providers can participate on an equal basis results in the lowest cost providers as the price setters and hence incentivises further investments in technologies such as OCGTs or continued operation of existing, old, high emission plants such as diesel gensets. The emission performance standard and the cost of carbon slow down the rate of investment in this area but if the carbon price is not high enough the capacity payment would in fact be a good mechanism to promote building fossil fuel peaking plants.

Grid scale energy storage can provide a flexible and responsive reserve and decrease the overall carbon footprint of the system. Both high power as well as energy requirements can be fulfilled by different storage technologies which are commercially available. It can also prove to be more beneficial than DSR and EVs, because of its size, technical characteristics and ability to be managed and controlled centrally by one operator.

The current proposed mechanism if based only on the capacity shortfall and tendering procurement process and in the absence of a support scheme for storage would not incentivise investment in this area.



23. What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?

The Electricity Market Reform consultation has set out the government's plans to restructure the electricity market in order to ensure both security of electricity supply and meet grid decarbonisation targets affordably and sustainably.

The extent of the challenges the system faces due to the closure of large fossil fuel generation and the intermittency caused by the growing share of renewable generation in the supply mix is huge. However the mechanisms proposed in the EMR may not have a sufficiently strong potential to maintain the coherence and the connection necessary between the three fundamental objectives of EMR.

Through the proposed package of support mechanisms (FIT, targeted capacity payment, EPS, and carbon price) government seeks to encourage investments in the new low carbon technologies, such as smart grid, demand response, energy storage and interconnection, as well as further investments in the zero emission renewable generation. However the level of support and the number of large scale demonstration projects underway to showcase CCS, EVs, and DSR with smart metering technologies proves more tendency towards these specific technologies for the purposes of decarbonisation and security of supply.

We believe that the role of energy storage as a grid scale enabling technology rather than a generation asset has not been fully appreciated and understood. By increasing the utilisation of system wide assets (generation, distribution, transmission) at lower costs, and providing security of supply at lower emissions, energy storage proves to be beneficial for the entire power system and deliver the portfolio of objectives. The broad benefits of storage to the system security and CO2 emission reductions are not realized in the package proposed in the EMR.

There are barriers to power market entry for energy storage developers that we believe should be addressed by the government in the preferred package; otherwise the industry could face a lack of long-term investment in this sector:



- Current market mechanisms that incentivise other low/zero carbon technologies but not storage (ROC and FIT for renewables)
- Current legislation that does not allow DNOs to take full advantage of energy storage
- Uncertainty over the potential applications and revenue streams available to storage owner/operator
- Uncertainty over the broad range of system benefits from different storage technologies and opportunity to deploy at different places on the network

We therefore believe that in order to incentivise investments in the energy storage sector, government should consider a storage specific capacity payment. Changes to the license agreements could also solve the issue of ownership and transform the basic concept of the technology from a trading device, with arbitrage as the sole revenue stream, to a network wide enabling system.

24. Which of the two models of targeted capacity mechanism would you prefer to see implemented:

- **Last-resort dispatch; or**
- **Economic dispatch?**

Highview favours taking into account a carbon content into whichever the dispatch mechanism is adopted.

At high penetration of intermittent generation the requirement for different types of reserve services increases. OCGT has been a reliable and low cost technology to provide reserve but high emission. The emergence of large scale commercial energy storage technologies (other than pumped hydro) offers a low carbon alternative to OCGT. We therefore believe that to support and encourage the contribution of the capacity offered by energy storage to the market, a low carbon dispatch should also be considered as well as last-resort or economic dispatch.

25. Do you think there should be a locational element to capacity pricing?

On the whole, Highview believes that there should be a locational element to the capacity payments to incentivise new capacity to be built in the areas where the demand is high and



there is not enough generation available. This also contributes to relieving congestion on the network.

Energy storage installed close to the point of demand generally enhances the utilisation of all assets. Adding a locational element to the capacity payment is a signal for investment in technologies which are not geographically constrained.

However, it will be important that the market structure does not disincentivise the co-located deployment of storage at the point of generation if this is the most efficient route to capture and manage renewable energy.

32. What changes do you think would be necessary to the institutional arrangements in the electricity sector to support these market reforms?

- As discussed in question 23, current Electricity Act restricts transmission and distribution network companies from trading electricity. Distribution connected energy storage can ideally contribute to load management and therefore defer infrastructure upgrades; however this does not allow TNOs or DNOs to take full advantage of energy storage.

We therefore recommend a review of the details of the licences held by the network companies and/or the underlying legislation to facilitate the full realization of energy storage market benefits by the DNOs and TNOs as owners and operators of storage.

- Consideration of how energy storage can be integrated with renewable generation assets without impacting on their incentives. Even if deployed alongside an energy from waste plant or wind generation farm to enhance the management of their output (i.e. better match supply to demand), energy storage necessarily draws excess/waste power from the grid to maximize overall system efficiency. Under current legislation, where this would be done 'inside the fence' for maximum capital and operating efficiency (as is the case for some energy storage technologies), it could impact on the generation assets incentives as bringing in brown electricity. Legislation needs to recognise the additive value of energy storage integrated with must run or intermittent plant, rather than create an economic barrier.

Ends.

