

National Infrastructure Commission
1 Horse Guards Road
London
SW1A 2HQ

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National Infrastructure Commission call for evidence: Electricity interconnection and storage

UK Power Reserve is an independent power generator with an extensive smart generation portfolio across England and Wales. Our primary business is to support the security of energy supply in the UK through our reserve supply services to National Grid. We are also committed to supporting the government's objective of decarbonisation through the flexible supply services we offer; unlocking the capacity for a flexible renewable energy infrastructure in the UK. To date, UK Power Reserve is the most successful and largest developer of new build gas-fired distributed generation in the Capacity Market, and continues to play a key role in shaping the future of the UK energy industry. UK Power Reserve welcomes this consultation and sets out our views to assist the National Infrastructure Commission in identifying the UK's long term energy infrastructure requirements.

1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

Significant recent progress has been made to better position the UK electricity market to meet this objective, notably through the implementation of Cash Out Reform (P305) in November 2015 and the Capacity Market Auction in December 2014/2015. In combination these reforms will have implemented positive long-term changes toward ensuring security of supply, and incentivising efficient market behaviour in balancing electricity supply and demand.

The system operator role has shown to work very well to date and can boast one of the best operational records internationally. However, in order to achieve optimal performance at the minimum cost to consumers, we believe further attention is needed on the actions and costs incurred by the system operator.

Actions from the system operator

We have recently seen a significant increase in the complexity and number of commercial balancing services from what was already a complicated area of the market. Below is a table of the variety of commercial balancing services on offer from National Grid in 2014 and now in 2016 (NB: this does not include mandatory ancillary services such as Frequency Response and Reactive Power).

2014	2016
Reserve <ul style="list-style-type: none"> - Short Term Operating Reserve (STOR) - Fast Reserve - BM Start Up Frequency Response <ul style="list-style-type: none"> - Firm Frequency Response (FFR) - Frequency Control by Demand Management (FCDM) 	Reserve <ul style="list-style-type: none"> - Short Term Operating Reserve (STOR) - STOR Runway - STOR + - Enhanced optional STOR - Fast Reserve - BM Start Up - Demand Side Balancing Reserve - Supplemental Balancing Reserve Frequency Response <ul style="list-style-type: none"> - Firm Frequency Response (FFR) - FFR bridging contracts - Frequency Control by Demand Management (FCDM) - Enhanced Frequency Response

As shown in the table above, the number of commercial balancing services on offer has doubled. Whilst we are seeing the positive development of innovation in balancing services, it is consumers who ultimately bear the costs of these services. Although National Grid have a licenced obligation to balance electricity supply and demand at all times, and at the minimum cost to consumers; there is evidence to suggest that the system operator has not effectively procured balancing services at the most optimal cost. To highlight some examples;

Strategic Reserve procured via SBR/DSBR versus STOR

The introduction of SBR was procured at a total cost of £122.4m, for 3,577MWs (de-rated) equating to £34.21/kW for availability over the 2016/17 winter periodⁱ. In relation to a comparable existing product such as STOR, which has been procured at a firm cost of £12m for 1800MWs (de-rated) equating to £6.67/kW in 15/16 over a comparable winter period; this represents a five-fold increase in price paid for the same capacity over the same period.

We feel this highlights the need for additional scrutiny from the regulator and greater transparency from the system operator, which in this case we believe has resulted in additional costs to the consumer. In addition, this is further supported by the fact that consumers are exposed to 100% of pass-through costs under SBR, whereas STOR costs feed through the National Grid and Ofgem negotiated incentive scheme. Whilst the system operator has justified that SBR has been procured as a secondary reserve product to ensure security of supply, as opposed to a primary balancing service as STORⁱⁱ; both services contribute to the same objective of balancing supply and demand. We feel this also demonstrates how the current commercial arrangements designed by the system operator are becoming increasingly complex, and has created unintended market distortions due to the multiple ways of buying market volumes. Such distortions can already be seen in the shift of market volumes previously providing available capacity under STOR, then being attracted into higher value SBR contracts. This can ultimately result in a reduction of immediate supply in primary balancing services such as STOR, increasing the risk to utilise secondary reserve SBR capacity at a significantly higher cost.

Market behaviour in balancing services

We are increasingly seeing contracts awarded to capacity that have subsequently become unavailable to the system operator after being awarded a contract creating the 'Phantom MW'. The result of such market behaviour is the displacement of market capacity that would have otherwise been available to fulfil contracts. This also creates an unintended distortion where tenders can appear over-subscribed and more competitive than they actually are, which can in turn negatively impact bid prices in future tender rounds. Examples of this can be seen in the STOR market where there is significant evidence of volumes becoming unavailable once procured. Examples of over 800MW of STOR contracted volumes have become consistently unavailable, however their bid volume and price positions have been published in market dataⁱⁱⁱ. In addition, up to 400MW of unavailable volumes have been committed contracts (reported in red as NBM_C_UNAVAIL), which should have otherwise contributed to an 1800MW target of committed STOR capacity for the system operator. This represents a 23% distortion of target procured volume to ensure daily capacity reserves are ready and available to the system operator to respond to daily supply shortages.

Market Transparency and awareness

Another example where we believe greater transparency is needed is in the bilateral contracting of capacity, of which the market is not made publicly available. Several bilateral balancing service contracts in the Bridging FFR product and STOR+ product were awarded by the system operator in 2015, of which there is little information available pertaining to the cost or volume of these contracts. These contracts have been awarded up to 24 months in duration covering the period 2016 – 2018. As information on cost or volume has still to be published, such volumes will have a direct impact upon other tenders for Firm Frequency Response (FFR) market and the system operator's volume requirements over the period. This again could have potential adverse effects on the market signal and competing participants bid behaviour at the ultimate cost to the consumer due to inconsistent levels of transparency.

Electricity Balancing System

Soon to be implemented is the new Electricity Balancing System (EBS) due to go live later in 2016. This new system should optimise replace National Grid current despatch decision processes with a new system taking into consideration all commercial and technical parameters available to National Grid closer to real time to ensure that the optimal commercial decisions are being taken whilst managing supply and demand. We would like to see the new EBS interface become demand/supply side friendly to enable supply side Balancing Mechanism (NBM) Units (BMUs) to access the post gate closure balancing market more readily to encourage more participation and competition. A BM for Non Balancing Mechanism (NBM) demand side capacity.

Independent System Operators

Whilst the current market arrangements with a national system operator have shown to have worked well for the UK electricity market it has been a sole buyer driven market which has shown signs of many distortions; and we believe there is a case for a system of localised operators to be explored.

The natural monopolistic position of the system operator has inherent issues pertaining to market competition and efficiency, often requiring intervention from the regulator to correct market failures. We believe a model of Independent System Operators at the regional level, in combination with a national system operator, could be able to manage the electricity infrastructure through greater visibility and direct control over the local Distribution Network, as well as the ability to create a more competitive market through multiple buyers of balancing and reserve services.

Steps for the longer term

We believe these services should be simplified where possible and procured using competitive processes on the basis of cost to ensure the efficient market operation for all technologies, including both generation and demand side response. The creation of new services has introduced more complexity and issues relating to transparency that arise from the monopolistic position of the system operator, who is able to take these actions with little cost to their organisation and at full pass-through cost to the consumer.

In the longer term to ensure best value for the consumer we would like to see;

- Greater scrutiny from the regulator, specifically in how National Grid procures balancing services including follow up on phantom MWs entering into balancing services.
- Greater transparency on National Grid's methodology in procuring balancing services
- Sign off for all bilateral contracts by the regulator accompanied by evidence that the best price for procured contracts has been negotiated
- Simplification of commercial balancing services frameworks to create a seller's market to ensure the end consumer is getting value for money
- Benchmarking of assessment for comparative balancing services (eg. SBR v STOR)

2. What are the barriers to the deployment of energy storage capacity?

Energy Storage faces the same barriers to entry as do all thermal generation technologies that do not receive long term subsidies, which translate into a higher level of risk. Battery storage in particular is currently at a relatively high cost in comparison to other technologies, combined with a shorter comparable asset lifecycle. The recent launch of the Enhanced Frequency Response has attracted interest in this area, and the tender process offering 4 year contracts from 2017 from National Grid should provide an opportunity that removes many barriers to entry for energy storage technologies, specifically battery storage. The introduction of the capacity mechanism should also complement other opportunities in the UK market that should further encourage investment in energy storage technologies, as long as they offer value for money and can compete with other technologies such as OCGT's, demand/load curtailment, standby/backup generation and interconnectors.

3. What level of electricity interconnection is likely to be in the best interests of consumers?

Using National Demand as the sole measure we would see 10% - 12% of National Peak Demand (approx. 5GW – 6GW) would offer a balanced position to UK consumer whilst providing valued capacity to the UK and European power markets and flexibility to the National Grid to manage supply, demand and capacity margins.

4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

Related to our response to point 1 above we see the best value in the longer term is ensuring that procurement practises being executed now pertain to best practise and are not isolated in their assessment of value when procuring for balancing services. We believe we should also start to examine the case for Independent or Regional System Operators, by looking at international examples such as the US, towards delivering a more efficient market. We believe a more robust market for balancing services can only be delivered if there are multiple buyers and sellers for services rather than a single buyer in the current market arrangements.

ⁱ **National Grid SBR Market Information Winter 2016/17 p.4: Available at:**

<http://www2.nationalgrid.com/UK/Services/Balancing-services/System-security/Contingency-balancing-reserve/SBR-Tender-Documentation/>

ⁱⁱ **Demand Side Balancing Reserve and Supplemental Balancing Reserve – Supplemental Note #1. Available at:** <http://www2.nationalgrid.com/UK/Services/Balancing-services/System-security/Contingency-balancing-reserve/Archive/>

ⁱⁱⁱ **Monthly Balancing Services Summary – September 2015: Figure 2.3.3. Available at:**

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/>