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Dear Sirs,

Consultation on models for a Capacity Mechanism in Electricity supply URN 11D/823

Thank you for inviting responses from interested parties on this complex issue. I hope that BOC's concise response, structured around general observations and principles rather than specific questions, is of use in your assessment.

Context: The UK's environmental targets will accelerate both the amount of intermittent renewable power supplied into the grid, and the closures to the oil-fired power plants which historically helped the power companies to meet their responsibility to match supply and demand. This consultation seeks to find a path out of this conundrum at a time when the global economy is moribund and capital is constrained.

In reaching its conclusions, BOC has drawn on its experience as a significant STOR provider, from the "new" Gas interruption regime, and from comparisons with other international mechanisms in which the wider Linde group of companies participates. Key to these points is that BOC's primary purpose is the manufacture and sale of industrial gases and related products, not the generation and sale of electricity. A stable grid delivering power at an affordable price is clearly critical to achieving BOC's objectives, but as our processes are low-temperature ones, the case for in-house CHP is weak, so look at this question from the position of offering demand-side services.

Summary Observations: The tiny percentage of Interruptible gas consumers prepared to bid into the new Gas interruption regime may be seen as a parallel for the proposed requirement for electricity reserve margin to be defined four years before delivery. Such a model might work for some generation plant investments if guaranteed to remain contracted for their whole life, but it fails to account for the volatility of the market prices, uncertainty of customer demand, of unplanned outages (like that of the Moyle interconnector about to affect Ireland) plus for a demand-reduction contributor, the day-by-day production reality of how full one's storage is. A truly flexible demand management system will need a Day-Ahead or Within-Day auction to discover the required reserve at the right price, using systems as accessible to a large generator as to a relatively smaller demand-reduction provider, and at the same marginal prices.

By the same token, the concept of a Value-of-lost-load is highly questionable as it will differ across industry sectors, driven by how quickly plants can restart, and will depend on stock levels held; again it is worth making reference to the Gas Significant Code Review which is addressing the same issues. From a global perspective it should be noted that interruption damages manufacturing plant so is a disincentive to invest in any geography regularly affected by blackouts.

Finally, the conclusion may need to consider the location of the delivered reserve; it may be more valuable to have flexible capacity close the areas that are short, than several hundred miles away in areas that are long. This would reduce investment costs in Transmission networks, one of the biggest elements in the £200Bn to be found in the coming decade for the GB grid.

Responses:

Q1 How would the fixed dispatch price work in practice given the points above? On "Transparency & Independent oversight", the setting up of a regulated, independent body free of political conflicts and commercial influence responsible for reserve setting would tend to stifle the requirements for "Contract Flexibility" and for "Innovation". On "Contract Flexibility" the mitigation statement is inadequate. Whoever the 'Reserve Procurement Function' is needs to have the flexibility to come up with bespoke agreements which suit Demand-Side Reduction, and particular elements within DSR in order to maximise the contribution; it is not simply about the length and structure of the agreements.

Q2 A fixed 4 year lead time is suitable for broad estimation of the gap between Generation and Supply, but cannot be accurate enough for detailed planning as there are too many uncertainties in the interim.

Q3 DSR can be enhanced by longer term contracts (for example to under-write removing plant bottlenecks or increasing storage), but flexibility is needed for short-run high-price events as well.

Q4 Strategic Reserve should meet all the above, plus lead time to start ramping.

Q5 To maximise DSR the reserve needs to understand the restrictions, horizons and capabilities of providers and have the freedom to cater for these in developing bespoke contracts.

Q6 Neither is right; a system which had a mixture of economic and last-resort despatch would offer the most protection.

Q7 It is inevitable that short-term pressures will impact on availability and on price. To try to split them is to ignore the economics of production.

Q8 Of course. The choice of Auditor depends on separation from the Central Procurement Body.

Q9 If despatch is economic, then is Strategic Reserve not an extension of STOR? If there is interaction with STOR surely this means that one or the other schemes has been priced incorrectly, which if sustained would lead to decline in that market area.

Q10 Too complex; trying to look a rigid 4 years ahead will limit short-term opportunities whilst stifling long-term ones, and will always miss the next major trend.

Q11 Taken overall, a Strategic Reserve Targeted mechanism seems a less workable solution than a Capacity Market or a Reliability one.

Q12 By the TSO, National Grid.

Q13 The model outlined in 3.20 is sensible for planned provision. There is no danger of market foreclosure on DSR. Provision is still needed for On-the-Day responses as well.

Q14 Option B and yes, D as well.

Q15 Yes and No respectively, assuming normal ethical/solvency qualifications.

Q16i Surely this is for the Generator to decide based upon its business processes and tools?

Q16ii The criterion is simple; "can you switch on (off for DSR) in your allotted time?" it does not require a complex methodology and could be done on the day.

Q16iii At the system marginal price.

Q17/18 Some element of reference pricing can be calculated from Cost-of-Capital and Fuels pricing, and could be used for lower levels in the call-off hierarchy (similar to the Irish Pool). However, in extremis, the maximum capacity will be made available using a short-term pricing model, and for the bidders into this mechanism a flexible system is needed which rewards generation and demand-side contribution equally, but does not encourage gaming between STOR and the short-term traded markets.

Q19 No comment offered.

Q20 The level of vertical integration has advantages in balancing and responsibility (and for the Suppliers themselves, self-hedging) but at the expense of transparency and liquidity. If Balancing costs are attributed to the Supplier directly, rather than smeared across Consumers, then the risk of gaming would be reduced.

Q21 No comment offered.

Q22 By understanding that DSR technologies are different to generation; and that short- or long-term mean very different things in different markets.

Q23 No. However as a side note, the introduction of Aggregators into the STOR process has blurred the boundaries between the TSO and the Consumers, this short-term and still immature expedient cannot be to the TSO's long-term advantage, though time will tell.

Q24 The trigger in a truly functioning market is price, but that is dependent on fuels as well as on other factors, and needs to be responsive in the short term.

Q25 A market mechanism using a mix of long-term agreements for peaking units, on a set of option prices, but with a backup of on-the-day short-term measures.

In conclusion, the solution must be a market-wide one, responsive to changing circumstances, and which is as open to demand-side reduction as it is to large incremental generation. To achieve that equality, it may be necessary to net off Transmission losses to value the response where it is needed, not where it is produced. It should also be recognised that every demand-reduction offer is dependent on the circumstances of that company's production, reliability and stock levels just as much as it is a response to the energy market's conditions; these factors vary dramatically between sectors, and may change from day to day. A spot element (which may have a small capacity charge, but a larger variable element) is therefore essential within the design of this system, just as option triggers are lower down the "stack".

Finally, please be clear that Demand Reduction is almost always the greenest, lowest carbon solution to the problem of peak management, as it removes the requirement for the highest emission generators called off last. It also lowers overall demand, hence the intersection on the price/demand curve, and hence the delivered price for the other users who remain on. These attributes more than justify the additional effort required to develop a sector-by-sector approach and maximise the value from it.

With kind regards,

Yours faithfully



