

Electricity Capacity Assessment: Measuring and Modelling the Risk of Supply Shortfalls

Prepared by Swanbarton Limited for the Electricity Storage Network (UK)

Swanbarton Limited
The Old Cakehouse
Dairy Farm
Pinkney
Malmesbury
Wiltshire
SN16 0NX

Tel: 01666 840948

Introduction

Thank you for the opportunity to respond to this consultation. The Energy Storage Network is an alliance of industrial, commercial and academic organisations interested in the development use and application of electricity storage. We therefore have a keen interest in the topics raised in this consultation.

Response to Consultation Questions

Below are our responses to the specific questions raised in the consultation document.

Question 1: Do you agree that the de-rated capacity margin is a good indicator of future capacity adequacy?

This would be a valid indicator, provided that its calculation was applied in a consistent manner over time, and that its calculation took account of all forms of capacity on the system, including storage.

Question 2: Are there any measures of risk other than LOLE and EEU that we should report and what are their comparative advantages?

The impact of internal transmission and distribution capacity constraints in the GB system should be included. In addition, any impact of external capacity, such as interconnectors, should be carefully moderated, as these may not necessarily be available at times of most system stress.

We also comment that capacity may be considered to be two directional. It is possible (and probable) that in the future, substantial flexible capacity, acting in both positive and negative directions will be required to balance short term operational needs. This is a key area where storage may play a part.

Question 3: Are there any additional key input assumptions that we should consider in the modelling?

The role of electrical energy storage has not been given prominence in the consultation document. While representing only a small percentage of capacity at present, substantial growth in centralised and distributed storage is now occurring in other countries and this would be a useful source of capacity for the GB system.

Question 4: Do you agree that the use of stochastics (probability distributions) to model short-term variation of key input variables is the best available method? Do you agree with the use of scenarios and stress tests for capturing long term uncertainty in key input variables?

Our understanding is that it is important to provide a model with a realistic time interval in order to calculate the short term variations with enough granularity to check for short term as well as long term balance of supply and demand. At periods of high stress, such as high demand. Low demand, high renewable generation, a wide range of scenarios need to be considered.

Question 5: Do you agree with the proposed approach to modelling wind availability?

We consider that the first option is preferable, even given advances in wind turbine technology. As more data for GB generation from wind becomes available the model should be updated. The impact of wind generation, in both a positive and negative sense is likely to be critical for consideration and planning of the network, and for rewarding the capacity providers, including providers of electricity storage, and so we consider that an accurate model should be used.

Question 6: Do you agree with the proposed use of NGET's existing data and assumptions, regarding, in particular, commissioning and decommissioning dates and embedded generation?

Yes

Question 7: Do you believe that Ofgem should require industry stakeholders to submit up-to-date data with regard to commissioning and decommissioning dates and embedded generation? Which industry process will ensure the confidentiality of information provided?

Yes. There is a need to use as much up-to-date data as is available.

Question 8: What are your views on how best to model LCPD opt-out plants' restricted running regimes?

This is outside our consideration

Question 9: Which of the two approaches for modelling electricity interconnection flows will provide the most realistic flows? If you favour the scenario based approach, what are your views on reasonable scenarios to run?

We have a concern that the role of interconnectors within energy markets is not a precise and predictable science. Market participants will trade energy based on prices on both sides of the interconnectors and it is not possible to realistically model the GB system, without also modelling in detail the systems on the other sides of the interconnectors and considering the relative costs, constraints and market behaviour. A two stage approach may be required, to start modelling using NETS SYS assumptions with the aim of developing a specific model for the interconnection flows, which would then be used in the future to provide input into the assessment of capacity required.

Question 10: Under what conditions would users respond by curtailing their demand and how would you go about modelling this? Is it worth Ofgem requesting data from DNOs on self-interruption and interruptible contracts?

Ofgem will need as much up-to-date accurate data as can be sourced. Anecdotal experience from other countries where demand side response has been trialled has shown a range of consumer behaviours, from active participation responding to even small tariff changes, to largely indifferent behaviour.

Question 11: Is historical data of scheduled outages a good indicator of future patterns of scheduled maintenance timings?

Historical data may be an easy option initially. However as the generation mix changes towards more variable and must-run generation then outages for maintenance will also change on basis of the requirements for the various generation types.

Question 12: Will treating half-hour periods independently have significant effects on our estimates of the de-rated capacity margin and risk of supply shortfalls and how should the model take into account half-hourly cross-correlations?

Our experience of analysing the use of electricity storage suggests that short time intervals are required if an accurate assessment is to be obtained. The TSO balances the system continuously and therefore any modelling should use short time periods that reflects this, while recognising the need for computational efficiency.

Question 13: Are there any boundaries other than Cheviot that may significantly affect the risk of supply shortfalls?

This is outside our consideration.