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## **Electricity Capacity Assessment: Measuring and modelling the risk of supply shortfalls**

Socrates,

### **Introduction**

SmartestEnergy welcomes the opportunity to respond to Ofgem's consultation on Electricity Capacity Assessment: Measuring and modelling the risk of supply shortfalls.

We note that the December 2010 Energy Bill amended the Electricity Act 1989 (Electricity Act) to insert a new section which obliges Ofgem to provide the Secretary of State with a report assessing different electricity capacity margins and the risk to security of supply associated with each alternative. We note further that under some forms of Capacity Mechanisms, the Secretary of State will need to form a view on the level of electricity supply capacity required for the purpose of meeting the demands of existing and future consumers in GB.

We agree with Ofgem's view that NGT are "best placed to carry out the modelling that will inform Ofgem's annual report to the Secretary of State." We agree that this will ensure consistency with other existing reports where appropriate. It will also make use of NGET's unique knowledge of the market and their data and modelling capabilities. We should also not forget that NGT were responsible for systems which calculated loss of load probabilities under the Pool.

We note Ofgem's view that any decision on the required capacity level will have significant consequences for consumers and other market participants. It is true that if the capacity level is set too high, it may result in unnecessarily high prices to pay for the excess capacity and that if set too low it could result in supply issues if the capacity level is not sufficient to cope with demand. We are of the view that to judge this correctly for any central body is going to be impossible. This leads us to conclude that

a market mechanism is preferable to any random or mechanised approach which will inevitably lead to the wrong answer.

### **General views on the approach**

We note that Ofgem would like to receive comments on their approach and which of the specific modelling and data proposals would be most appropriate for producing an assessment of the risk of supply shortfalls in Great Britain.

We are generally comfortable with Ofgem's plans to take transmission constraints into account viz the development of a two region model: with one being England and Wales and the other Scotland.

However, we are concerned that the Ofgem approach does not take into account the different flexibility characteristics of the plants to arrive at the de-rated capacity margin and the measures of risk. We believe that this level of detail is significant because it is not just the level of capacity that is relevant but also whether the technology mix (and its inherent flexibility) is appropriate.

We are also of the view that, as gas supplies have important implications for the electricity system, it is important to model gas fuel availability explicitly. We do not believe that the suggested stress tests would produce meaningful results.

### **Additional issues**

There are some questions in the document which cannot be found in the list of questions:

4.38. Ofgem are also asking industry whether it is worth Ofgem requesting additional data from DNOs on embedded generation.

We are unclear as to what is being suggested here. If Distribution Network Operators (DNOs) currently submit data to NGT then they should continue to do so. We agree with the proposal to use NGTs existing data and assumptions on non-wind embedded generation as per the NETS SYS.

4.41. Ofgem are seeking views from industry stakeholders on how to model DSR and whether it is worth Ofgem requesting additional data from DNOs on DSR.

We do not believe that distributors have a full and clear understanding of what demand side capabilities exist in their areas. If the information gleaned is not complete it is not much use. We should not forget that in our deregulated market it is up to suppliers to offer demand side products to customers.

### Ofgem's specific questions

For your convenience we answer Ofgem's specific questions below in the order in which they are presented in the consultation document.

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

Yes. It would clearly be inappropriate to use maximum capacities which are not achievable for long periods. We understand that de-rated capacity margin is measured relative to peak demand but that the electricity system could also be under stress at non-peak demand times. It is therefore appropriate to record a seasonal (or even dynamic) capacity.

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

Expected Energy Unserved (EEU) is not a measure of risk. Ultimately it is the most important output but there are other variables (including LOLE) which lead to its calculation. At a higher level the calculation is:  $(LOLE * \text{de-rated capacity}) - \text{demand} = EEU$ .

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

As stated elsewhere in this document, weather, gas, outage history, run-up rates (flexibility), emissions limits, value of lost load etc are all important inputs to the model.

**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?

We are comfortable with the use of probability distributions. However, we believe that the use of scenarios is not sophisticated enough and will lead to subjective value judgements.

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

No, we do not think it is a good idea to convert wind speeds to wind generation by using technical specifications of wind turbines. It is our view that the level of error between those two would be greater than using historical correlation of wind speeds and wind generation availability. Wind technology may have developed significantly in recent years but the distance between weather stations and wind turbines (the greatest cause of error) has not.

Whilst we understand the concept of net-of-wind demand, we do not understand the rationale behind the following assertion: "We treat wind on the demand side because it is weather driven, unlike other forms of generation."

The consultation document states that "wind availability and demand are correlated, and therefore, it is important that the methodology captures this correlation." We suspect that a large part of this correlation is related to the fact that a lot of wind generation is embedded. It is not clear how this will be disaggregated from the analysis. This does not mean, however, that we are in favour of gross reporting; NGC has no responsibility for connections to distribution networks and should forecast on a net basis.

**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?

We are not entirely convinced of the benefits of ensuring confidentiality. The main issue, surely is that there can be no guarantees of the accuracy/veracity of the information unless there is some kind of penalty (which would be unrealistic)

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

We believe that it is important to include LCPD opt-out plants' restricted running regimes in the modelling. This data could be obtained from Elexon.

**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 favour building a specific model for the interconnection flows based on prices which we understand entails modelling the GB and interconnected countries electricity systems to come up with the prevailing electricity prices and the interconnector flows. The alternative approach of assuming no flows with the continent is far too simplistic and scenarios around this would just be meaningless.

**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?

In theory customers should respond to price and a Value of Lost Load for different types of customers should be established. This was not sophisticated enough under the Pool and has not been researched sufficiently since.

We do not believe it is worth asking DNOs about self-interruption or interruptible contracts because they do not have such commercial arrangements in place.

In the future a Smart world will enable greater demand side participation but this will take many years to develop. For the time being we do not believe this is worth including in the modelling.

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

Yes, we would say that historical data is a reasonable indicator and was the method used by NGT under the Pool. The first option of modelling electricity prices is not only more complex but also fundamentally flawed because of the interaction between price and availability. A third option is also possible but we have mixed feelings about approaching generators direct for plans as, whilst in theory this would be more accurate, it is also open to gaming.

**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?

The examples given in the document of demand side reduction and pumped storage being less sustainable over long periods are possibly not significant. Clearly, however, it is important to take a view on the level of accuracy

expected from the output of the modelling and to determine whether these two example together have capacity greater than that expectation.

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

Clearly the Cheviot boundary is the most significant. It is difficult for us to assess whether other boundaries are so significant that they will affect the risk of supply shortfalls.

As with many of these issues, it is best to rely on NGT's expertise rather than interfere.

Should you wish to discuss any aspect of this matter, please do not hesitate to contact me.

Yours sincerely,

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