RESPONSE TO OFGEM CAPACITY ASSESSMENT METHODOLOGY CONSULTATION

A note from Pöyry Management Consulting to Ofgem

January 2014

INTRODUCTION

The Electricity Act 1989 obliges Ofgem to provide the Secretary of State with an Electricity Capacity Assessment report by 1st September every year to assess the risks to security of supply over the next six winters. As such, Ofgem is not proposing any methodological changes for the 2014 report however it is consulting various stakeholders to get the views on the validity of the general approach for assessing the risks to electricity security of supply and uncertainty of the outlook for the 2014 report.

This note is Pöyry's response to Ofgem's consultation on methodology for electricity capacity assessment 2014, published on 28 November 2014. Below we have expressed our views with reference to the questions asked in this consultation by Ofgem.

Question 1: Do you agree that the general methodology used for the 2013 report is still valid to analyse GB's generation adequacy in the next five winters from 2014/15 to 2018/19? If not, please explain why and make some specific suggestions for the methodology and their comparative advantages.

Question 2: Do you agree with using a qualitative approach to assess the impact of interconnector flows on LOLE and EEU in our Reference Scenario and sensitivities? If you disagree, please provide justification and suggestions for alternative approaches.

Question 3: Do you agree with our proposed approach to capture the uncertainties of a potential relationship between wind availability and high-demand on the level of risk? Please justify and provide suggestions for alternative options and their comparative advantages.

Answer to Q1, Q2 and Q3:

We see following key aspects of the current methodology applied by Ofgem for analysing generation adequacy in GB which require attention.

Time-collapsed probabilistic model and loss of temporal correlations between key system variables

Time collapsed probabilistic models have been extensively applied in the past for evaluation of risk indices in conventional (thermal dominated) systems due to their ease of implementation as well as lower data and computational requirements. A key challenge faced by these probabilistic models is their inability to capture the variability and temporal interaction between demand and supply as they are primarily based on the long-term behaviour of demand and supply. Key limitations of the model include:

- The convolution of the distributions of winter demand, conventional generation availability and wind output (as applied in the time-collapsed probabilistic model) results in losing the chronological interaction between these key system variables as well as with interconnection flows.
- Furthermore, with the ongoing development in GB power system due to increasing share of intermittent renewables, complex (technical and commercial) interactions are evolving between demand and supply as well as with interconnected markets through interconnectors, which are not robustly captured by this model.
- This approach, applying mean seasonal availabilities of conventional (thermal) plants to prepare a capacity outage table, does not capture the interdependencies between the daily and weekly (business and non-business days) cycles of demand and available conventional generation.

Hence, the corresponding computed risk indices like de-rated margins may not be a robust measure to indicate system risk (also indicated by Ofgem). For example, it is possible that the minimum de-rated margin based on either peak demand period (hour) or convolved demand and supply probability distribution curves might not be the most critical (least margin) period of the year and some other period (e.g. a relatively lower demand coinciding with low or no wind output and lower availability of thermal plant) results in a more tight/small capacity margin during a given year.

Impact of electricity prices and price differentials between markets on plant availabilities and cross border flows

Generators optimise their operational strategies based on expected revenues (linked to electricity prices) which are increasingly becoming more important with the increase in intermittent generation in the system. Therefore, it is expected that short-term (few hours to few days) availabilities of conventional plants will be linked to the electricity prices and expected levels of intermittent generation. This would also impact the dependence on cross border flows as conventional plant availabilities on both sides of the interconnectors may significantly differ from the expected mean seasonal availabilities. These impacts are expected to become more pronounced as market coupling progresses in Europe. Therefore, there is a need to incorporate the influence of electricity prices in the generation adequacy analysis.

Alternative approach

Considering above factors we suggest that there is a need to apply more detailed models/approaches for assessing the true risk of supply in future systems with increasingly higher share of intermittent generation. For example a generation system simulation based approach (for each hour of the winter season or entire year) using credible fuel and CO_2 price projections would be more appropriate to quantify the risk of supply in future systems. Such an approach would:

- Capture the correlation between demand and wind availability through maintaining the chronological order of demand and wind output applying multiple historical weather (demand and wind) year patterns for each future year. The issue of inconclusive evidence of the correlation between (peak) demand and wind speed will be embedded and resolved in such an analysis. Also this would allow assessing the impact of inter-year variations in the correlation between wind and demand.

- Model the (relatively short-term) correlation between demand and conventional generation availability.

- Forecast the expected contribution of interconnectors (and its variation) to GB capacity adequacy including the impact of electricity price differentials between the interconnected markets.

- Optimize the use of DSR according to market price signals hence, providing a more accurate picture of the potential contribution of DSR to capacity adequacy.

Such an approach can quantify all the risk indices as calculated by currently applied probabilistic approach however, those will be based on more detailed and realistic behaviour of both demand and supply sectors of the electricity system.

Question 4: Do you agree with the use of sensitivities to represent the main uncertainties facing the electricity security of supply outlook at the moment? If not, please provide specific reasons and alternatives.

Question 5: Do you agree that our proposed sensitivities around interconnector flows, generation capacity, and peak demand capture the uncertainties that have the most significant impact on the level of risk? If not, what other sensitivities should we consider and why?

Question 6: Do you agree that the Reference Scenario and associated sensitivities provide a sufficient range of possibilities for the electricity security of supply outlook? Please provide suggestions for alternative options and their comparative advantages.

Question 7: Do you agree that the different demand projections presented in the report provide a sufficient range of possible demand outcomes? If not, please suggest alternatives and their comparative advantage.

Question 8: What sensitivities do you think would be most appropriate to include in our main summary graphs (e.g. Executive Summary), and why?

Sensitivity studies included in 2013 report provides a range of system risk indices under the impact of change in a single specific factor (i.e. system variable) in each study. This helps to identify the key drivers of GB system security. However, in a real system different variables are correlated and dependent on each other. Therefore from a practical point of view it becomes difficult to assess the whole system risk conditions under uncertainties based on individual sensitivity studies only.

An alternative approach would require creating and analysing a set of internally consistent scenarios (around reference scenario) involving the relationship between key risk drivers and thus pragmatically capturing the combined effect of main uncertainties.

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