

## Use of non-CM generation data in the calculation of the Load Following Obligation

Expert Group / Project Board: Wednesday 29<sup>th</sup> May

### Background

The performance of a Capacity Provider during any scarcity event will be measured against its Load Following Obligation (LFO)<sup>1</sup>.

A Capacity Provider's Load Following Obligation ought to be adjusted for production from non-Capacity Market resources: high production from these resources lowers the Obligation on the CM resources. This paper addresses the appropriate process to determine this production: either it is advised retrospectively once the production level is known, in a similar manner to the outturn electrical demand component of the LFO formula, or it is advised in advance based on a forecast for every Settlement Period of the year (thereby bringing a degree of certainty to the Capacity Providers).

The LFO as set out in the Strawman v10.1 is included in appendix A to this paper. The policy position set out in Strawman v10.1 is that the value should be determined retrospectively for each half hour (i.e. ex-post).

### Key Questions for the Project Board / Expert Group

*Q1: Does the PB / EG believe that these are the two key areas where the impact of the policy decision needs to be assessed, or are there others?*

*Q2: Does the PB / EG have any observations on the analysis of both options? Has the analysis missed any substantive issues?*

*Q3: Does the PB / EG agree or disagree with the conclusion of the paper to retain the policy as set out in the Strawman v10.1 on this issue?*

### Impact of the Options

The key questions around the two options available are:

1. Who is best placed to manage the forecast risk associated with the output of non-CM capacity – consumers or capacity providers?
2. What are the wider consequences of either consumers or Capacity Providers taking on the forecast risk?

*Q1: Does the PB / EG believe that these are the two key areas where the impact of the policy decision needs to be assessed, or are there others?*

### **Option A: Calculate for each half hour of the year (ex-post)**

Under this option the proposition is that Capacity Providers are best placed to manage the forecast risk. Under this option a Capacity Provider cannot be sure of its plant's LFO until shortly after real-time, as it will be dependent on the actual output of plant not in the

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<sup>1</sup> The LFO will subsequently be adjusted to account for the actions of the System Operator and any Balancing Services Contracts – however this paper is focussed on the LFO prior to such adjustment.

Capacity Market. However this figure could be calculated and published<sup>2</sup> soon after the half-hour in question. This would be in a similar manner to the information on outturn electrical demand that is also an integral part of the LFO calculation and which also will not be known until shortly after real-time. Arguably then the Capacity Provider community will be able to see how the output of non-CM plant is performing throughout the year and develop short term forecasting methodologies based upon this data feed<sup>3</sup>.

Turning to the wider consequences, if the parameter is calculated for every single half hour of the year then the incentives provided by the LFO will be most appropriate for each half hour. An appropriately calculated half-hourly incentive for Capacity Providers will ensure that the security of supply offered by the Capacity Market is both maximised and optimised. The capacity purchased through the Capacity Market can be thought of as providing security of supply by making up the “difference” between sources of capacity provided from outside the Capacity Market and the demand for electricity. While inevitably a forecast of this is required at the four- or one-year ahead auctions, building in an outturn figure into the actual LFO will be most efficient. Should the output of non-Capacity Market plant be **higher** than assumed in the auctions, using an outturn figure will ensure that extra, unnecessary capacity will not be incentivised by the LFOs of Capacity Market plant. Similarly if the output of non-Capacity Market plant be **lower** than assumed in the auctions, the LFOs of Capacity Market plant will incentivise the shortfall to be met by the Capacity Market plant – subject always to the safeguard that a LFO may never rise above 100% of the plants’ maximum capacity.

This accuracy in turn generates another benefit namely that over-delivery and penalty payments may be generated against an accurate baseline.

***Option B: Feed in a single assumed contribution of non-Capacity Market output (ex-ante)***

Under this option the proposition is that Capacity Providers are not in a position to manage the forecast risk and thus it is fairer for consumers to effectively assume the forecast risk around the output of non-CM Capacity.

Under this choice a flat rate figure representing the assumed contribution of the output of non-CM plant would be fed into the LFO calculation. When providing advice to the Secretary of State on the overall capacity to procure, the System Operator will make certain assumptions about the contribution of non-CM capacity. These assumptions could then be used to generate a fixed assumed contribution of non-Capacity Market capacity for each half hour.

One benefit of this approach is that there would be an increased certainty amongst Capacity Providers of their likely LFO in each half-hour, although as the LFO is also based upon outturn electrical demand it could still not be known with absolute certainty until after the event.

A disadvantage of the approach is primarily that of accuracy as it is almost certain that in each half hour this assumption will be incorrect. This will bring about two issues – firstly if

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<sup>2</sup> The data items required to enable this would be the outturn electrical demand for the period and the output of all CM plant in the same half hour. Both are known within minutes after real time, albeit both are approximate. The variable ‘NCMCC’ can then be calculated by subtracting the aggregate output of CM plant from the outturn electrical demand figure.

<sup>3</sup> Many energy market participants already perform a very similar forecast as they seek to schedule plant in the energy market to meet its contractual positions net of renewables output. Therefore such forecasting experience already exists in the market.

the assumption about output of non-Capacity Market plant is too conservative for a half-hour then the combined LFOs of every Capacity Provider will in aggregate incentivise too much capacity to be made available in every half hour, with the converse if the estimate is too optimistic. This is likely to lead to sub-optimal despatch of plant as the aggregate capacity obligation does not match with actual need. This sub-optimality could be both significant initially and then grow as the proportion of non-Capacity Market plant with respect to the total market rises with increasing volumes of CfD plant and interconnection.

The second issue is then one of the impact of the assumption on the behaviour of plant through a stress event. Again it is highly unlikely that the assumed output of non-Capacity Market plant will be the same as the actual value through the stress event. Therefore the incentives provided by the penalty or over-delivery regime will similarly be inaccurate. Providers may find themselves being penalised excessively if the assumed value is less than the actual output of non-Capacity Market plant and vice-versa. Similar issues would exist with over-delivery payments.

*Q2: Does the PB / EG have any observations on the analysis of both options? Has the analysis missed any substantive issues?*

## Conclusions

To conclude the principal issue with the approach set out in the strawman is one of which party – consumers or Capacity Providers – is best placed to manage the forecasting risk of the output of non-CM plant. DECC is of the opinion that through the prompt posting of indicative value of 'NCMCC' within timescales similar to that used for the posting of outturn demand information the forecasting risk faced by Capacity Providers in the short term is an order of magnitude lower than the risks faced by consumers should a four- or one- year ahead value be utilised.

As such this paper recommends that the current policy as set out in v10.1 of the strawman should be retained.

*Q3: Does the PB / EG agree or disagree with the conclusion of the paper to retain the policy as set out in the Strawman v10.1 on this issue?*

## Appendix A: Strawman (v10.1) definition of the Load Following Obligation

$$\text{Load Following Capacity Obligation } LFCO_{ij} = \frac{(AACO_{ij} + PTCO_{ij})}{2} \times \min\left(\frac{(SD_j - NCMCC_j)}{\sum_i AACO_{ij}}, 1\right)$$

Where

$AACO_{ij}$  is the value in MW of the Capacity Obligation taken on by CMU “i” for half-hour “j” in the capacity auctions preceding half-hour “j”

$PTCO_{ij}$  is the value in MW of the Capacity Obligation taken on by CMU “i” for half-hour “j” in the secondary physical capacity markets preceding half-hour “j”

$SD_j$  is the outturn System Demand in period “j” as determined by the System Operator in accordance with a pre-defined methodology that will seek to correct metered demand for any instructed load reduction under DSR or Grid Code instructions.

$NCMCC_j$  is the Capacity Contribution of non-CM units in period “j” determined ex-post

$\sum_p$  is the sum over all such units “p”

$\sum_i$  is the sum over all such units “i”