

Definition of Balancing Service Contract Capacity Credit

Summary

1. Capacity market participants are obliged to deliver against their Adjusted Load Following Capacity Obligation (ALFCO), four hours after the issuing of the Capacity Market Warning. The capacity obligation is scaled in line with transmission system demand, to support efficient scheduling of generation, and is also adjusted to reflect instructions from the system operator and provision of balancing services which restrict a capacity provider's ability to deliver against the capacity obligation.
2. This paper sets out two options to derive the Balancing Services Contract Capacity Credit term which is included in the formula for the ALFCO to reflect the volume of a Capacity Market Unit (CMU) which is under contract to provide a balancing service where that balancing service restricts the provider's ability to meet the capacity obligation.
3. The ALFCO is set out in the Capacity Market Rules and is described in the formula given below:

$$ALFCO_{ij} = LFCO_{ij} + QBOA_{ij} + \min(QBST_{ij}, 0) + \min(QAS_{ij}, 0) - QBSCCC_{ij}$$
4. Many of the terms within the formula for the Adjusted Load Following Capacity Obligation are already set out in the Balancing Settlement Code and the relevant data already available to the BSCCo for settlement of electricity trading. However, the terms Balancing Service Contract Capacity Credit, $BSCCC_{ij}$, and $QBST_{ij}$, which describes reduced output pursuant to a BMU Specific trade, are not existing terms and are required by the $QBSCCC_{ij}$ term.
5. The first approach defines $BSCCC_{ij}$ for each balancing service while the second considers the declared availability of the balancing services provider. This second option allows for only two definitions of $BSCCC_{ij}$ to be required; one which would apply to all balancing services when provided by Balancing Mechanism Units and a second which would apply to all balancing services when provided by parties not active in the Balancing Mechanism. Implementing this would require a change to the $QBSCCC_{ij}$ term in the ALFCO formula and would remove the need for the $QBST$ term.
6. Where a definition for each service is required (Option A in this paper), as was envisaged during drafting of the Capacity Market Rules for Consultation, changes to documents detailed in Standard Condition C16 of the Electricity Transmission Licence would be required. However to implement the alternative proposal

(Option B), changes would be limited to the Capacity Market Rules as published for Consultation.

7. The Expert Group is asked for its view on the benefits or issues with the options presented.

Background

8. If successful at auction, capacity providers are obliged to deliver electricity or reduce demand consumption at times of system stress. The volume of capacity obligations (CO) auctioned is that sufficient to meet peak demand for electricity in line with the Reliability Standard set by Government. This base obligation is scaled in line with transmission system demand to preserve efficient scheduling of generation, becoming a Load Following Capacity Obligation (LFCO)
9. Some instructions from the System Operator could appear to be in conflict with the obligation to deliver capacity (e.g. those to manage transmission system constraints). Also some balancing services contracts may impede a provider's ability to deliver the obligation, as some volume may be restricted from delivery or effectively be under SO control.
10. The LFCO is thus adjusted to reflect these instructions and balancing service contracts, effectively reducing the obligation of the impacted CMU, and becoming the Adjusted Load Following Capacity Obligation (ALFCO). This should ensure:
 - A CMU is not penalised for apparent failure to deliver their capacity obligation when under instruction from the SO
 - The Capacity Market does not introduce an incentive to deviate from SO instructions as this would jeopardise the safe and secure operation of the transmission system
 - Bid prices submitted to the BM are not polluted with risk premium associated with an apparent CM delivery failure
11. Where the balancing service sterilises some capacity, the adjustment to reflect contracted balancing services is achieved in the CM rules by applying a credit, BSCCCij, to reduce the capacity provider's obligation. This credit must be reduced where the balancing service is called off by the SO; this ensures that failure to deliver a balancing service as contracted is not considered successfully delivery against the capacity obligation.

12. Discussion on policy instructions and implementation of these instructions originally envisaged a separate definition for each balancing service being set out within the suite of documents required under Standard Condition C16 of the Electricity Transmission Licence. These definitions would be developed as part of the ongoing work on consequential changes to existing Codes (Option A below)
13. This work highlighted that it may be possible to draft changes to the Capacity Market Rules which would apply across the suite of applicable balancing services in a more effective manner than developing separate definitions for each service (Option B below).

Definition of BSCCC_{ij} – Option A

14. This option focuses on the volume under contract and so requires a specific accurate calculation of this volume for each balancing services contract. The residual credit (QBSCCC_{ij}) to be applied is then calculated by considering the volume under contract and subtracting instructions from the SO, via both the BM and other non BM methods, from that volume. This is shown below.

$$BSCCC_{ij} = \sum_{s \geq 0} (QAO_{ij}^s + QAB_{ij}^s) - \max(QAS_{ij}, 0)$$

15. This would require a definition of the contracted volume for each type of existing balancing service, and require additional elements to be added to the definition as new services are developed.
16. Definitions would be required for:
- STOR
 - Fast Reserve
 - Constraint Management Contracts, including those where a party must submit a set FPN
 - Firm Frequency Response (FFR)
 - Commercial intertrip services
17. The definition for FFR would become a calculation for each provider to capture the level of de-load necessary for that specific unit to deliver its contracted primary, secondary or high frequency response service. Some constraint management contracts place a cap on the PN the provider can submit to the BM for a specific unit or cap the PNs across a station and so different treatment would be required depending on the contract and how the provider elects to operate plant within the limits of that contract.

18. As such, within some balancing services a separate definition of $BSCCC_{ij}$ would be required on a contract by contract basis, increasing complexity of settlement of the capacity market and introducing delays to development of new services and negotiating existing balancing services contracts.

Definition of $BSCCC_{ij}$ – Option B

19. This option assumes that the capacity provider would have delivered at maximum available capacity in the absence of the balancing services contract. This is consistent with the assumption of rational economic behaviour used in the derivation of de-rating factors, which assumes a unit would deliver maximum capacity if available. As such it does not require specific information on contracted volumes while reflecting the impact of the balancing services contract on the provider's ability to response to the capacity market warning.
20. The residual capacity credit to be applied ($QBSCCC_{ij}$) is then calculated from the availability figure submitted and subtracting the amount it is expected to produce, taking account of SO instructions. As such, this option also requires a change to $QBSCCC_{ij}$.
21. This requires a different definition for $BSCCC_{ij}$ for BM and non BM providers to capture how availability information is submitted to the System Operator. While different treatment is required the two types of providers, within these categories a single definition would apply across all existing services which would be anticipated to hold across new services as long as the underlying assumption on economic rational behaviour holds.

BM Units

22. The definition of $BSCCC_{ij}$ draws on existing terms within the Balancing Settlement Code.
23. Where a Capacity Committed CMU is a BM Unit and actively participates in the Balancing Mechanism during Settlement Period "j", the Balancing Services Contract Capacity Credit for Capacity Committed CMU "i" in Settlement Period "j" ($BSCCC_{ij}$) is a Volume in MWh calculated as follows:

24. $BSCCC_{ij} = MEL_{ij}$

Where:

MEL_{ij} is the Maximum Export Limit of Capacity Committed CMU "i" for Settlement Period "j", determined by integrating the Maximum Export Limit over all spot times falling within that Settlement Period

And:

Maximum Export Limit has the meaning given to that term in the Grid Code [being, "a series of MW figures and associated times, making up a profile of the maximum level at which the BM Unit may be exporting (in MW) to the National Electricity Transmission System at the Grid Entry Point or Grid Supply Point, as appropriate"]

25. The term $\sum_{n=0} (QA0_{ij} + QAB_{ij})$ in the $QBSCCC_{ij}$ formula would be replaced by QME_{ij} , the expected quantity of energy that a particular BM Unit is expected to export taking account of accepted bids or offers. As such, the complexities associated with FFR and constraint management contracts would be avoided.

26. This approach would also remove the requirement for the $QBST_{ij}$ term in the ALFCO formula.

Non BM Units:

27. Where a Capacity Committed CMU is not a BM Unit or does not actively participate in the Balancing Mechanism during Settlement Period "j", the Balancing Services Contract Capacity Credit for Capacity Committed CMU "i" in Settlement Period "j" ($BSCCC_{ij}$) is a Volume in MWh calculated as follows:

$$BSCCC_{ij} = \text{Declared Availability}$$

Where:

"Declared Availability" is the declared availability of Capacity Committed CMU "i" for Settlement Period "j" (expressed in MWh), as determined in accordance with the balancing service contract entered into pursuant to Condition C16 of the System Operator's Transmission Licence in relation to the provision by the Capacity Committed CMU of the balancing service

28. There would be no change to the formula for $QBSCCC_{ij}$ as the credit would be reduced by the instruction from the System Operator as given by the existing QAS term.

Comparison of Options:

29. Option A does not consider what a provider may have delivered in the absence of the balancing services contract but focuses on the details of the contract and subsequent system operator instructions. Option B focuses on what a provider would be expected to deliver absent the balancing services contract, assuming a provider would deliver maximum capacity at times of system stress; it follows that the CMU should receive credit for the difference between MEL and delivered output.
30. This change in approach allows for one definition of $BSCCC_{ij}$ to apply for all balancing services provided by BM participants and a second for all balancing services provided by non BM participants, simplifying the drafting required.
31. Several balancing service do not place a restriction on MEL values submitted and as such this could give rise to concerns that MEL data could be manipulated to give a greater allowance than is necessary. While balancing services contracts do not typically include a specific value for MEL, examination of BM providers of STOR has shown that the volume under contract is consistently within 2MW of MEL. As such, this potential impact is considered minimal.

Discussion

32. The Capacity Market Expert Group is asked for views on the options presented.