Issue 106 Digital Meeting Etiquette

- Welcome to the Issue 106 Workgroup meeting 4 – we’ll start shortly
- No video please to conserve bandwidth
- Please stay on mute unless you need to talk – use IM if you can’t break through
- Talk – pause – talk
- Lots of us are working remotely – be mindful of background noise and connection speeds

Slido Guidance

- We would love to gather your thoughts using Slido as we move through today’s session. We hope this is an engaging experience.
- Everyone should be able to vote and answer questions live during the presentation using Slido

Requirements:

- Internet access
- Web browser

Participants can join at slido.com with **#7784509** or via the link: https://app.sli.do/event/kavMJTH7ySJFK6ucbPaLtv

Issue 106 ‘Review of BSC Credit Cover Arrangements’

Meeting 4

15 August 2023

Recap until Meeting 4

- Previous meeting (3) was held 15 June 2023
  - Objective 1: agree on one of the proposed solutions for the ‘looking backwards’ part of the new Credit Cover Calculation ✓
  - Objective 2: vote on the proposed solution for CAP ✗
  - Objective 3: vote on the proposed solution for Credit Default **?** (further analysis needed)

Meeting Agenda

Objectives for meeting 4:

- Objective 1: agree on the proposed solutions for the ‘looking forward’ Credit Cover Calculation
- Objective 2: vote on proposed solutions for the Credit Risk profiles and the Credit Risk Criteria

Agenda Item	Lead
1. Welcome and meeting objectives	Roger Harris (Elexon) – Chair
2. Work stream 3 - Fairness and equality • Looking forward aspect of New Credit Cover Calculation • Credit Risk profiles and risk criteria	Chris Wood (Elexon) - Market Design and Tirath Maan (Elexon) – Subject Matter Expert
3. Next steps	Jacob Snowden (Elexon) - Lead Analyst
4. Meeting close and AOB	Chair

PREVIOUS DISCUSSIONS

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What should Credit be used for?

In the event of a default, there needs to be funds to cover Charges accrued, and potential charges that maybe accrued between default and Market Exit

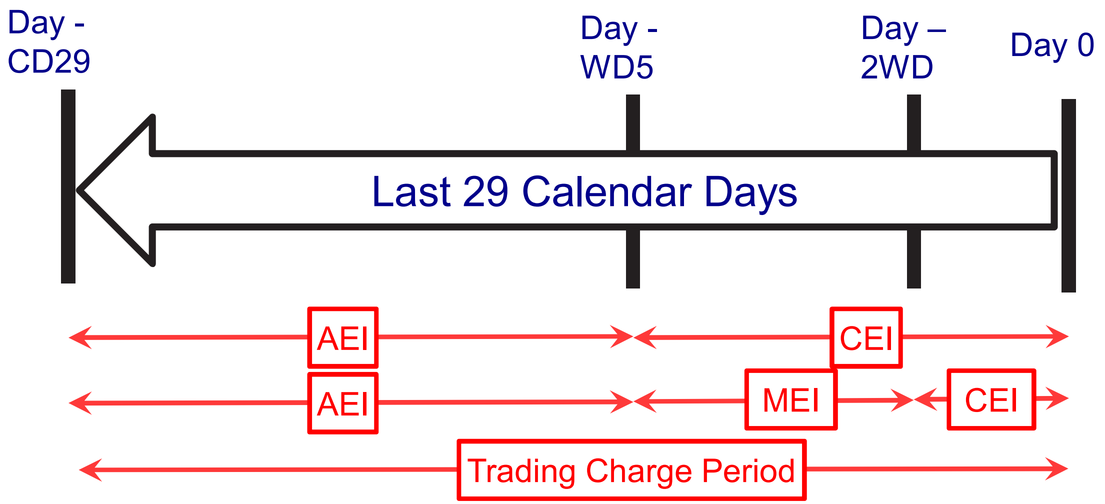
In simple terms – we need to be able to access enough money to cover outstanding costs at the point of Market Exit

Existing Credit Calculation

$$Credit\ Assessment\ Energy\ Indebtedness + \ (Metered\ Energy\ Indebtedness) + Actual\ Energy\ Indebtedness = Total\ Energy\ Indebtedness$$

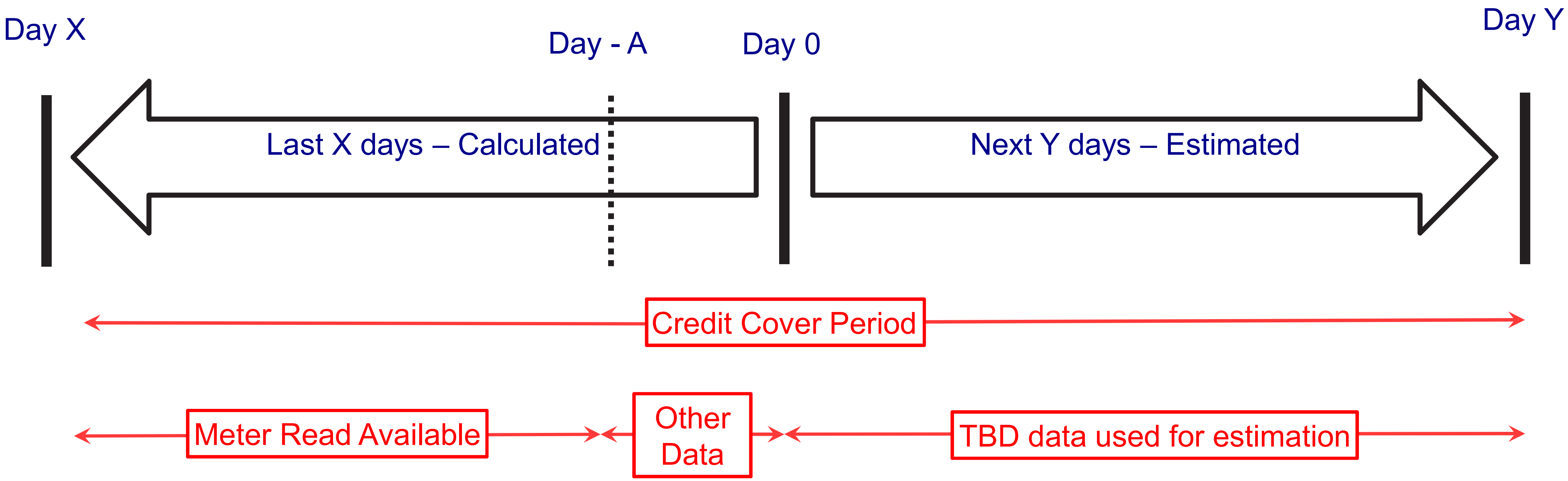
$$CEI\ +\ (MEI)\ + AEI = TEI$$

- CEI (and MEI) – is a volume in MWh based on estimates
- That is then add to AEI, which is Trading Charges (a monetary amount in £ that has to actually be paid) divided by the CAP (a nominal figure in £/MWh – this then gives us an estimated Volume in MWh
- The three values summed give us TEI, a value in MWh
- The TEI is then multiplied by CAP to give a price in £
- This is the amount that we base Credit calculations on such that, if this amount is more than 80% of the Credit lodged, we will start to take default actions

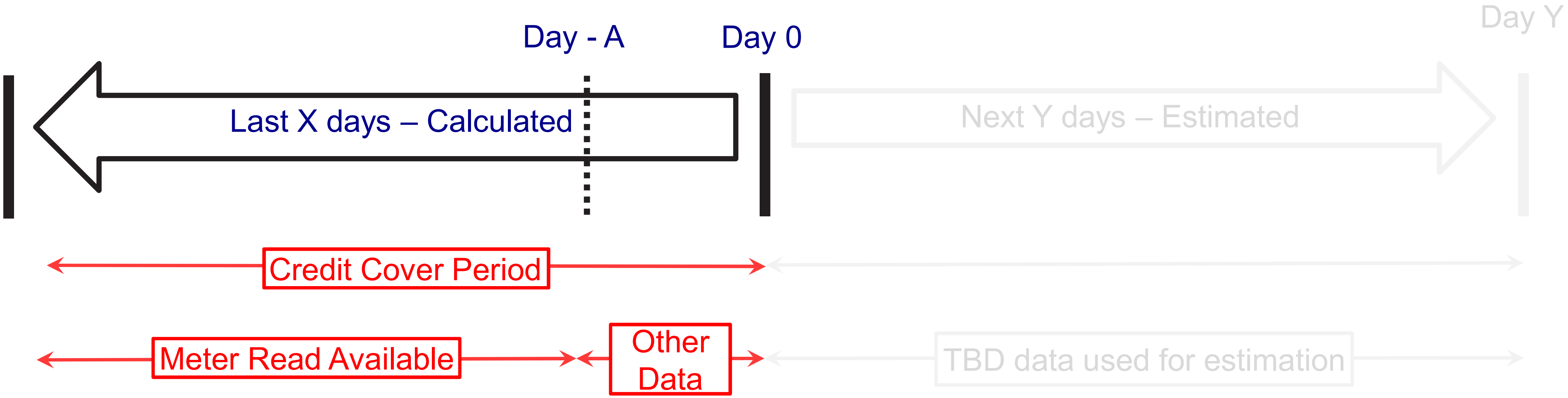


Proposed Credit Calculation post MHHS Implementation

Trading Charges from previous X days + An amount TBD for next Y days



Proposed ‘looking back’ part of the calculation



- Between ‘Day –A’ and ‘Day X’ we will use existing calculations for Trading Charges – an amount in Pounds Sterling (£)
- Between ‘Day 0’ and ‘Day –A’, options agreed for further Investigation were:
  - To use average meter reads as proxy for BM Unit Metered Volume (QM_{ij}) for calculating Trading Charges between Day 0 and Day A
  - Second preference was to use rolling average of trading charges for period Day 0 – A
  - Third option was dynamic GC/DC and CALF values using more up to date values rather than the same season last year
    - ‘Dynamic’ means updating weekly/monthly almost on a rolling basis
  - Discounted – Lead Party submitting proxy reads and/or GC/DC and CALF values

TRADING CHARGES

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Trading Charges

- The Trading Charges are the single net credit or debit amount (expressed in £) for that Imbalance Party as referred to in Section T5.3.3(c)
  - Initially we calculate the amount per Trading Account, then the net amount for each Lead Party for each of their BM Units

1. Daily Party BM Unit Cashflow
   - Balancing Volumes adjusted for losses multiplied by price summed over a day for each Settlement period in that day
2. Daily Party Non-Delivery Charge
   - BM Unit Volumes adjusted for losses multiplied by non delivery charges adjusted for System price
3. Daily Party Energy Imbalance Cashflow
   - Delivered Volumes and Balancing Volumes, adjusted for Losses and SBMU non-delivery minus Energy contracts, combined with Contract Volumes transfers – all multiplied by System Sell Price
4. Daily Party Information Imbalance Charge
   - BM Unit Volume adjusted by FPN Volumes and Bid and Offer Volumes and non-BM Volumes, but all time zero, so Information Imbalance Charge is always zero
5. Daily Party Residual Settlement Cashflow;
   - BM Unit Metered Volumes, adjusted by Balancing Services Volumes and Reallocations, multiplied by combination of various cashflows combined
6. Daily Party RR Cashflow;
   - RR Activation Volumes adjusted by RR Activation Price
7. Daily Party RR Instruction Deviation Cashflow
   - RR Activation Volumes, adjusted by activation prices and Bid/Offer differences compared to the Deemed Standard Product Shape

- Trading Charges are mixture of BM Unit Volumes, Balancing Volumes, losses, non delivery charges, FPN and non-BM Volumes

DAILY PARTY BM UNIT CASHFLOW

Daily Party BM Unit Cashflow

$CBM_p = \Sigma_j \Sigma_{i \in p} CBM_{ij}$ where Σ_j represents the sum over all Settlement Periods and $\Sigma_{i \in p}$ is the sum of all BM Units for which Party p is the Lead Party

- $CBM^n_{ij} = \Sigma nCO^n_{ij} + \Sigma nCB^n_{ij}$
  - $CO^n_{ij} = QAO^n_{ij} * TLMij * PO^n_{ij}$
    - $QAO^n_{ij} = \Sigma kQAO^{kn}_{ij}$
    - $TLM_{ij} = 1 + TLF_{ij} + TLMO^+_j$
      - $TLMO^+_j = – \{\alpha(\Sigma{+}QM_{ij} + \Sigma{-}QM_{ij}) + \Sigma{+}(\text{non-I})\ (QM_{ij} * TLF_{ij})\} / \Sigma{+}(\text{non-I})\ QM_{ij}$
  - $CB^n_{ij} = QAB^n_{ij} * TLM_{ij} * PB^n_{ij}$
    - $QAB^n_{ij} = \Sigma kQAB^{kn}_{ij}$
- $CBMp = \Sigma j\ \Sigma i{\in}p\ (\Sigma n((\Sigma kQAO^{kn}_{ij}) * (1 + TLF_{ij} + (– \{\alpha(\Sigma{+}QM_{ij} + \Sigma{-}QM_{ij}) + \Sigma{+}(\text{non-I})\ (QM_{ij} * TLF_{ij})\} / \Sigma{+}(\text{non-I})\ QM_{ij})) * PO^n_{ij}) + \Sigma n((\Sigma kQAB^{kn}_{ij}) * (1 + TLF_{ij} + (– \alpha(\Sigma{+}QM_{ij} + \Sigma{-}QM_{ij}) + \Sigma{+}(\text{non-I})\ (QM_{ij} * TLF_{ij})\} / \Sigma{+}(\text{non-I})\ QM_{ij})) * PB^n_{ij}))$

Values included are:

- Period Accepted Offer Volume – the volume of Offer accepted as a result of Acceptance, where that Acceptance is not flagged as relating to an RR Schedule (QAO^{kn}_{ij})
- Transmission Loss Factor – the factor used to allocate transmission losses (TLM_{ij})
- BM Unit Metered Volume – The Metered Volume (QM_{ij})
- Offer Price – the amount in £/MWh associated with an Offer and comprising part of a Bid-Offer Pair (PO^n_{ij})
- Period Accepted Bid Volume – the volume of Bid accepted as a result of Acceptance, where that Acceptance is not flagged as relating to an RR Schedule (QAB^{kn}_{ij})
- Bid Price – the amount in £/MWh associated with a Bid and comprising part of a Bid-Offer Pair (PB^n_{ij})

DAILY PARTY NON DELIVERY CHARGE

Daily Party non delivery charge

- $CND_p = \Sigma_j \Sigma_{i\in p} CND_{ij}$
    - $CND_{ij} = \Sigma^n (CNDO^n_{ij} + CNDB^n_{ij})$
        - $CNDO^n_{ij} = QNDO^n_{ij} * \text{Max}\{(NDPO^n_{ij} – SBP_j), 0\} * TLM_{ij}$
            - $QNDO^n_{ij} = \text{Min}(AO^{nu}_{ij}, RQNDO^{u-1}_{ij})$
            - $NDPO^n_{ij} = PO^n_{ij}$
            - $SBP_j = SSP_j$
            - $TLMij = 1 + TLFij + TLMO^+_j$
                - $TLMO^+_j = – \{\alpha(\Sigma^+QM_{ij} + \Sigma^-QM_{ij}) + \Sigma^+_{(non-I)} (QM_{ij} * TLF_{ij})\} / \Sigma^+_{(non-I)} QM_{ij}$
        - $CNDB^n_{ij} = QNDB^n_{ij} * \text{Min}\{(NDPB^n_{ij} – SSP_j), 0\} * TLM_{ij}$
            - $QNDB^n_{ij} = \text{Max}(AB^{nu}_{ij}, RQNDB^{u-1}_{ij})$
            - $NDPB^n_{ij} = Pb^n_{ij}$
- $CND_p = \Sigma_j \Sigma_{i\in p} (\Sigma^n (((\text{Min}(AO^{nu}_{ij}, RQNDO^{u-1}_{ij})) * \text{Max}\{(PO^n_{ij} – SSP_j), 0\} * (1 + TLFij + (– \{\alpha(\Sigma^+QM_{ij} + \Sigma^-QM_{ij}) + \Sigma^+_{(non-I)} (QM_{ij} * TLF_{ij})\} / \Sigma^+_{(non-I)}QM_{ij}))) + ((\text{Max}(AB^{nu}_{ij}, RQNDB^{u-1}_{ij})) * \text{Min}\{(NDPB^n_{ij} – SSP_j), 0\} * (1 + TLFij + (– \{\alpha(\Sigma^+QM_{ij} + \Sigma^-QM_{ij}) + \Sigma^+_{(non-I)} (QM_{ij} * TLF_{ij})\} / \Sigma^+_{(non-I)} QM_{ij})))$

The additional values involved in the calculation are:

- Accepted Offer Ranking – the order of the Accepted Offer in decreasing order or price (AO^{nu}_{ij})
- Remaining Period BM Unit Non-Delivered Offer Volume – the amount of Non-Delivered Offer Volume remaining to be allocated ($RQNDO^{u-1}_{ij}$)
- System Sell Price – the price determined in respect of the Final Ranked Set of System Actions in accordance with BSC Section T4.4.3 (SSPj)
- Remaining Period BM Unit Non-Delivered Bid Volume – the amount of Non-Delivered Offer Volume remaining to be allocated ($RQNDB^{u-1}_{ij}$)

DAILY PARTY ENERGY IMBALANCE CASHFLOW

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Daily Party Energy Imbalance Cashflow

- $CAEI_p = \Sigma_j \Sigma_{a\epsilon p} CAEI_{aj}$, where $\Sigma_{a\epsilon p}$ represents the sum over the Energy Accounts and Virtual Balancing Account of Party p
  - $CAEI_{aj} = – QAEI_{aj} * SSP_j$
  - $QAEI_{aj} = QACE_{aj} – QABS_{aj} – QABC_{aj}$
    - $QACE_{aj} = \Sigma_i QCE_{iaj,}$
      - $QCE_{iaj,}$ for each Subsidiary Party $= \{(QM_{ij} – QBS_{ij}) * (QMPR_{iaj}/100) + QMFR_{iaj}\} * TLM_{ij}$
        - $QBS_{ij} = \Sigma^n (QAO^n{}_{ij} + QAB^n{}_{ij}) + \Sigma^n (RRAO^n{}_{ij} + RRAB^n{}_{ij}) + QAS_{ij} + BMUADDV_{ij} + SNBABSVD_{ij} – QDD_{ij} + QBSD_{ij}$
          - $BMUADDV_{ij} = \Sigma_N CORDC_{iNj} = (C_{iNj} + CLOSS_{iNj}) * (1 + (CF_{Hj} - 1) * WT_N)$
          - $SNBABSVD_{ij} = \Sigma_N CORABSVDC_{iNKj,}$
            - $CORABSVDC_{iNKj} = (MSABSVD_{iNKj} + MSABSVDL_{iNKj}) * (1 + (CF_{Hj} - 1) * WT_N)$
              - $MSABSVD_{iNKj} = AQVMD_{iNLKj}$
              - $MSABSVDL_{iNKj} = (\Sigma^{(vv)}{}_L ((\underline{LLF_{Lj}} - 1) * \Sigma^{(vv)}{}_{PR} AQVMD_{iNLKj}))$
          - $QBSD_{ij} = \Sigma_{i2} QSD_{iji2,}$
            - $QSD_{iji2} = QBS_{ij} - QSND_{ij}$
              - $QSND_{ij} = Max\{ Min(QBS_{ij}, QNDO_{ij}) , QNDB_{ij} \}$
                - $QNDO_{ij} = Min\{Max\{QME_{ij} – QM_{ij}, 0\},(\Sigma^n QAO^n{}_{ij} + \Sigma^n RRAO^n{}_{ij})\}$
                  - $QME_{ij} = FPN_{ij} + QBS_{ij}$
                - $QNDB_{ij} = Max\{Min\{QME_{ij} – QM_{ij}, 0\},(\Sigma^n QAB^n{}_{ij} + \Sigma^n RRAB^n{}_{ij})\}$
        - QBS_{ij} (for a subsidiary Party) $= \Sigma^n (QAO^n{}_{ij} + QAB^n{}_{ij}) + \Sigma^n (RRAO^n{}_{ij} + RRAB^n{}_{ij}) + QAS_{ij} + \Sigma_N ((C_{iNj} + CLOSS_{iNj}) * (1 + (CF_{Hj} - 1) * WT_N) - C_{iNj}) + \Sigma_N ((AQVMD_{iNLKj} + ((\Sigma^{(vv)}{}_L ((\underline{LLF_{Lj}} - 1) * \Sigma^{(vv)}{}_{PR} AQVMD_{iNLKj})))) * (1 + (CF_{Hj} - 1) * WT_N)) – QDD_{ij} + \Sigma_{i2}(QBS_{ij} - (Max\{ Min(QBS_{ij}, (Min\{Max\{(FPN_{ij} + QBS_{ij}) – QM_{ij}, 0\},(\Sigma^n QAO^n{}_{ij} + \Sigma^n RRAO^n{}_{ij})\})) , (Max\{Min\{(FPN_{ij} + QBS_{ij}) – QM_{ij}, 0\},(\Sigma^n QAB^n{}_{ij} + \Sigma^n RRAB^n{}_{ij})\})\})))$

Daily Party Energy Imbalance Cashflow

- Recalling that for each Subsidiary Party $QCE_{iaj,} = ((QM_{ij} - QBS_{ij}) * (QMPR_{iaj}/100) + QMFR_{iaj}\} * TLM_{ij};$
  - $QMPR_{iaj} = \Sigma_{z}QMPR_{ziaj}$
  - $QMFR_{iaj} = \Sigma_{z}QMFR_{ziaj}$
  - $TLMij = 1 + TLFij + TLMO^{+}{}_{j}$
    - $TLMO^{+}{}_{j} = - \{\alpha(\Sigma^{+}QM_{ij} + \Sigma^{-}QM_{ij}) + \Sigma^{+}{}_{(non-l)} (QM_{ij} * TLF_{ij})\} / \Sigma^{+}{}_{(non-l)} QM_{ij}$
- QCE_{iaj} for a Subsidiary Party $= \{(QM_{ij} - (\Sigma^{n} (QAO^{n}{}_{ij} + QAB^{n}{}_{ij}) + \Sigma^{n} (RRAO^{n}{}_{ij} + RRAB^{n}{}_{ij}) + QAS_{ij} + \Sigma_{N} ((C_{iNj} + CLOSS_{iNj}) * (1 + (CF_{Hj} - 1) * WT_{N}) - C_{iNj}) + \Sigma_{N} ((AQVMD_{iNLKj} + ((\Sigma^{(vv)}{}_{L} ((\underline{LLF}_{Lj} - 1) * \Sigma^{(vv)}{}_{PR} AQVMD_{iNLKj})))) * (1 + (CF_{Hj} - 1) * WT_{N})) - QDD_{ij} + \Sigma_{i2}(QBS_{ij} - (Max\{ Min(QBS_{ij}, (Min\{Max\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAO^{n}{}_{ij} + \Sigma^{n}RRAO^{n}{}_{ij})\})) , (Max\{Min\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAB^{n}{}_{ij} + \Sigma^{n}RRAB^{n}{}_{ij})\})\})))) * (\Sigma_{z}QMPR_{ziaj}/100) + \Sigma_{z}QMFR_{ziaj}\} * (1 + TLF_{ij} + (- \{\alpha(\Sigma^{+}QM_{ij} + \Sigma^{-}QM_{ij}) + \Sigma^{+}{}_{(non-l)} (QM_{ij} * TLF_{ij})\} / \Sigma^{+}{}_{(non-l)} QM_{ij}))$
- For the Lead Party $QCE_{iaj} = (QM_{ij} * TLM_{ij}) - \Sigma_{a}QCE_{iaj}$
- In the overall formula $QCE_{iaj} = (QM_{ij} * TLM_{ij}) - \Sigma_{a}(\{(QM_{ij} - (\Sigma^{n} (QAO^{n}{}_{ij} + QAB^{n}{}_{ij}) + \Sigma^{n} (RRAO^{n}{}_{ij} + RRAB^{n}{}_{ij}) + QAS_{ij} + \Sigma_{N} ((C_{iNj} + CLOSS_{iNj}) * (1 + (CF_{Hj} - 1) * WT_{N}) - C_{iNj}) + \Sigma_{N} ((AQVMD_{iNLKj} + ((\Sigma^{(vv)}{}_{L} ((\underline{LLF}_{Lj} - 1) * \Sigma^{(vv)}{}_{PR} AQVMD_{iNLKj})))) * (1 + (CF_{Hj} - 1) * WT_{N})) - QDD_{ij} + \Sigma_{i2}(QBS_{ij} - (Max\{ Min(QBS_{ij}, (Min\{Max\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAO^{n}{}_{ij} + \Sigma^{n}RRAO^{n}{}_{ij})\})) , (Max\{Min\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAB^{n}{}_{ij} + \Sigma^{n}RRAB^{n}{}_{ij})\})\})))) * (\Sigma_{z}QMPR_{ziaj}/100) + \Sigma_{z}QMFR_{ziaj}\} * (1 + TLF_{ij} + (- \{\alpha(\Sigma^{+}QM_{ij} + \Sigma^{-}QM_{ij}) + \Sigma^{+}{}_{(non-l)} (QM_{ij} * TLF_{ij})\} / \Sigma^{+}{}_{(non-l)} QM_{ij})))$
- Recalling that $CAEI_{aj} = - QAEI_{aj} * SSP_{j}$ where $QAEI_{aj}$ is the Account Energy Imbalance Volume and; SSP is the System Sell Price and:
  - $QAEI_{aj} = QACE_{aj} - QABS_{aj} - QABC_{aj}$ where $QACE_{aj}\ \Sigma_{i}QCE_{iaj}$ (See above)
  - $QABS_{aj} = (\Sigma_{i}QBS_{ij} * TLM_{ij}) + (\Sigma_{i2}QSND_{i2j} * TLM_{i2j})$
  - $QABC_{aj} = \Sigma_{b,\,z}\ ECQ_{zabj} - \Sigma_{b,z}\ ECQ_{zbaj}$
    - ECQ is Energy Contract volume – ab/ba dictates direction
- $CAEI_{p}= (- (\Sigma_{i}((QM_{ij} * TLM_{ij}) - \Sigma_{a}(\{(QM_{ij} - (\Sigma^{n} (QAO^{n}{}_{ij} + QAB^{n}{}_{ij}) + \Sigma^{n} (RRAO^{n}{}_{ij} + RRAB^{n}{}_{ij}) + QAS_{ij} + \Sigma_{N} ((C_{iNj} + CLOSS_{iNj}) * (1 + (CF_{Hj} - 1) * WT_{N}) - C_{iNj}) + \Sigma_{N} ((AQVMD_{iNLKj} + ((\Sigma^{(vv)}{}_{L} ((\underline{LLF}_{Lj} - 1) * \Sigma^{(vv)}{}_{PR} AQVMD_{iNLKj})))) * (1 + (CF_{Hj} - 1) * WT_{N})) - QDD_{ij} + \Sigma_{i2}(QBS_{ij} - (Max\{ Min(QBS_{ij}, (Min\{Max\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAO^{n}{}_{ij} + \Sigma^{n}RRAO^{n}{}_{ij})\})) , (Max\{Min\{(FPN_{ij} + QBS_{ij}) - QM_{ij}, 0\},(\Sigma^{n}QAB^{n}{}_{ij} + \Sigma^{n}RRAB^{n}{}_{ij})\})\})))) * (\Sigma_{z}QMPR_{ziaj}/100) + \Sigma_{z}QMFR_{ziaj}\} * (1 + TLF_{ij} + (- \{\alpha(\Sigma^{+}QM_{ij} + \Sigma^{-}QM_{ij}) + \Sigma^{+}{}_{(non-l)} (QM_{ij} * TLF_{ij})\} / \Sigma^{+}{}_{(non-l)} QM_{ij})))) - ((\Sigma_{i}QBS_{ij} * TLM_{ij}) + (\Sigma_{i2}QSND_{i2j} * TLM_{i2j})) - (\Sigma_{b,\,z}\ ECQ_{zabj} - \Sigma_{b,z}\ ECQ_{zbaj}))) * SSP_{j}$

Daily Party Energy Imbalance Cashflow - Values

- Period BM Unit Total Accepted Offer Volume – the quantity of Offer, accepted in respect of BM Unit, as a result of all Acceptances that are not flagged as relating to an RR Schedule (QAOn ij)
- Period BM Unit Total Accepted Bid Volume – the quantity of Bid, accepted in respect of BM Unit, as a result of all Acceptances that are not flagged as relating to an RR Schedule (QABn ij)
- Period RR Total Accepted Offer Volume – the quantity of Offer, accepted in respect of BM Unit, as a result of all Acceptances that are flagged as relating to an RR Schedule (RRAOn ij)
- Period RR Total Accepted Bid Volume – the quantity of Bid, accepted in respect of BM Unit, as a result of all Acceptances that are flagged as relating to an RR Schedule (RRABn ij)
- BM Unit ABSVD – in respect of a BM Unit and a Settlement Period, the Applicable Balancing Services Volume Data (ABVSD) sent by the NETSO to the SAA (QASij)
- Half Hourly Consumption (Non Losses) – the HH Consumption for a Consumption Component Class which is defined as not being line losses (CiNj)
- Half Hourly Consumption (Losses) – the HH Consumption for a Consumption Component Class which is defined as being line losses (CLOSSiNj)
- GSP Group Correction Factor – the factor by which the relevant components of GSP Group Consumption are adjusted (CFHj)
- GSP Group Correction Scaling Weight – the weighting for each Consumption Component Class used in GSP Group correction (WTN)
- ABSVD BM Unit Metered Consumption – the Metering System Delivered Volume value to the relevant Supplier BM Unit, Line Loss Factor Class and Consumption Component Class ($AQVMD_{iNLKj}$)
- Line Loss Factor – a multiplier which converts a SVA Metering System’s Consumption into its estimated value at the Grid Supply Point, that is including distribution losses (LLFLj)
- Period BM Unit Demand Disconnection Volume – the volume of energy for BM Unit that was subject to Demand Disconnection (QDDij)
- Period BM Unit Balancing Services Volume – the sum of the net quantity of accepted BOAs and the net quantity of energy associated with delivery of Applicable Balancing Services (QBSij)
- Period FPN – the the integrated MWh of energy implied by integrating the Final Physical Notification for BM Unit i over Settlement Period j (FPNij)
- Metered Volume Reallocation Percentage Data – a percentage of the BM Unit Metered Volume to be allocated to the corresponding Energy Account of a Contract Trading Party other than the Lead Party from the Energy Account of the Lead Party to which the associated Metered Volume Reallocation Notification refers (QMPRziaj)
- Metered Volume Reallocation Fixed Data – a fixed volume of Active Energy to be allocated to the corresponding Energy Account of a Contract Trading Party other than the Lead Party from the Energy Account of the Lead Party to which the associated Metered Volume Reallocation Notification (QMFRziaj)
- Transmission Loss Factor – the factor used to allocate transmission losses on a locational basis to BM Unit (TLFij)
- Energy Contract Volume from account ‘a’ to account ‘b’ – the Energy Contract Volume Data specified in the Energy Contract Volume Notification (ECQzabj)
- Energy Contract Volume from account ‘b’ to account ‘a’ – the Energy Contract Volume Data specified in the Energy Contract Volume Notification (ECQzbaj)

DAILY PARTY INFORMATION IMBALANCE CHARGE

Daily Party Information Imbalance Charge

- $CII_p = \Sigma_j \Sigma_{i \in p} CII_{ij}$
  - CIIij is the Information Imbalance Charge
  - CIIij = QIIij * IIPj
    - QIIij = |QMij – QMEij|
      - QMEij = FPNij + QBSij
        - QBSij = Σn (QAOn ij + QABn ij) +Σn (RRAOn ij + RRABn ij) + QASij + BMUADDVij + SNBABSVDij – QDDij + QBSDij

- CIIp = Σj Σi∈p((QMij – (FPNij + (Σn (QAOn ij + QABn ij) +Σn (RRAOn ij + RRABn ij) + QASij + BMUADDVij + SNBABSVDij - QDDij + QBSDij))) * IIPj)

- Information Imbalance Price – an amount equal to zero (T4.3.5) (IIP_j)

DAILY PARTY RESIDUAL SETTLEMENT CHARGE

Daily Party Residual Settlement Cashflow

- $RCRC_p = \Sigma_j \Sigma_{a \in p} RCRC_{aj}$
  - $RCRC_{aj} = RCRP_{aj} * TRCj$
    - $RCRP_{aj} = \{\Sigma^{+}_{i} (QCE_{iaj}) + \Sigma^{-}_{i} (– QCE_{iaj})\}/ \{\Sigma_a \{\Sigma^{+}_{i} (QCE_{iaj}) + \Sigma^{-}_{i} (– QCE_{iaj})\}\}$
    - $TRC_j = TCII_j + CSO_j + TCND_j – TCBM_j – TCRR_j + TCEI_j$
      - $TCIIj = \Sigma iCIIij$
        - $CII_{ij} = QII_{ij} * IIP_j$
        - $CII_{ij} = QII_{ij} * 0 = 0$
      - $TCIIj = 0$
      - $CSOj = (TCBMj + TCRRj) – TCNDj$
    - $TRC_j = TCBMj + TCRRj – TCNDj + TCND_j – TCBM_j – TCRR_j + TCEI_j$
    - $TRC_j = TCEI_j$
      - $TCEI_j = \Sigma_a CAEI_{aj}$

- $RCRC_p = \Sigma_j \Sigma_{a \in p} ((\{\Sigma^{+}_{i} (QCE_{iaj}) + \Sigma^{-}_{i} (– QCE_{iaj})\}/ \{\Sigma_a \{\Sigma^{+}_{i} (QCE_{iaj}) + \Sigma^{-}_{i} (– QCE_{iaj})\}\}) * (\Sigma_a CAEI_{aj}))$
  - QCE_{iaj} is the Credited Energy Volume as seen in the Daily Party Energy Imbalance Cashflow
  - $CAEI_{aj}$ = Daily Party Energy Imbalance Cashflow as seen previously

- There are no new values that we haven’t seen in previous Trading Charge calculations

VALUES TO PREDICT

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Values used in Trading Charge calculations - Volumes

Meter Volumes – All MWh

- BM Unit Metered Volume – The Metered Volume (QM_{ij})
  - Issue 106 to advise on best way to determine this volume – **ACTION REQUIRED**
- ABSVD BM Unit Metered Consumption – the Metering System Delivered Volume value to the relevant Supplier BM Unit, Line Loss Factor Class and Consumption Component Class ($AQVMD_{iNLKj}$)
  - Is determined by SVAA and is derived from BM Unit Metered Volume (QM_{ij}) (see above), and data submitted by VLP/AMVLP, which should still be submitted – No further action
- Half Hourly Consumption (Non Losses) – the HH Consumption for a Consumption Component Class which is defined as not being line losses (Cinj)
  - Is determined by SVAA and is derived from BM Unit Metered Volume (Qmij) (see above), and data submitted by VLP/AMVLP, which should still be submitted – No further action
- Half Hourly Consumption (Losses) – the HH Consumption for a Consumption Component Class which is defined as being line losses ($CLOSS_{inj}$)
  - Is determined by SVAA and is derived from BM Unit Metered Volume (Qmij) (see above), and data submitted by VLP/AMVLP, which should still be submitted – No further action
- Period BM Unit Demand Disconnection Volume – the volume of energy for BM Unit that was subject to Demand Disconnection (QDD_{ij})
  - Is determined by CDCA (BSCCo) and is derived from BM Unit Metered Volume (QM_{ij}) and historical values of QM_{ij}– No further action

Values used in Trading Charge calculations - Volumes

Balancing Volumes – all MWh

- Period FPN – the the integrated MWh of energy implied by integrating the Final Physical Notification for BM Unit i over Settlement Period j (FPN_{ij})
- BM Unit ABSVD – in respect of a BM Unit and a Settlement Period, the Applicable Balancing Services Volume Data (ABVSD) sent by the NETSO to the SAA (QASij)
- Period BM Unit Balancing Services Volume – the sum of the net quantity of accepted BOAs and the net quantity of energy associated with delivery of Applicable Balancing Services (QBSij)
- Period Accepted Offer Volume – the volume of Offer accepted as a result of Acceptance, where that Acceptance is not flagged as relating to an RR Schedule (QAOknij)
- Period Accepted Bid Volume – the volume of Bid accepted as a result of Acceptance, where that Acceptance is not flagged as relating to an RR Schedule (QAB^{kn}_{ij})
- Period BM Unit Total Accepted Offer Volume – the quantity of Offer, accepted in respect of BM Unit, as a result of all Acceptances that are not flagged as relating to an RR Schedule (QAO_{nij})
- Remaining Period BM Unit Non-Delivered Offer Volume – the amount of Non-Delivered Offer Volume remaining to be allocated ($RQNDO^{u-1}_{ij}$)
- Period RR Total Accepted Offer Volume – the quantity of Offer, accepted in respect of BM Unit, as a result of all Acceptances that are flagged as relating to an RR Schedule (RRAOnij)
- Period BM Unit Total Accepted Bid Volume – the quantity of Bid, accepted in respect of BM Unit, as a result of all Acceptances that are not flagged as relating to an RR Schedule (QABn ij)
- Remaining Period BM Unit Non-Delivered Bid Volume – the amount of Non-Delivered Offer Volume remaining to be allocated (RQNDBu-1ij)
- Period RR Total Accepted Bid Volume – the quantity of Bid, accepted in respect of BM Unit, as a result of all Acceptances that are flagged as relating to an RR Schedule (RRABn ij)

Issue 106 to advise on best way to determine these volumes – **ACTION REQUIRED**

Values used in Trading Charge calculations - Volumes

Reallocation Volumes

- Metered Volume Reallocation Percentage Data – a percentage of the BM Unit Metered Volume to be allocated to the corresponding Energy Account of a Contract Trading Party other than the Lead Party from the Energy Account of the Lead Party to which the associated Metered Volume Reallocation Notification refers (QMPRziaj)
  - If MVRNs remain extant, this will be in accordance with the MVRN volume. If the MVRN has been cancelled, will be equal to 0% - No further action
- Metered Volume Reallocation Fixed Data – a fixed volume of Active Energy to be allocated to the corresponding Energy Account of a Contract Trading Party other than the Lead Party from the Energy Account of the Lead Party to which the associated Metered Volume Reallocation Notification (QMFRziaj)
  - If MVRNs remain extant, this will be in accordance with the MVRN volume. If the MVRN has been cancelled, will be equal to 0% - No further action
- Energy Contract Volume from account ‘a’ to account ‘b’ – the Energy Contract Volume Data specified in the Energy Contract Volume Notification (ECQzabj)
  - If ECVNs remain extant, this will be in accordance with the ECVN volume. If the ECVN has been cancelled, will be equal to 0% - No further action
- Energy Contract Volume from account ‘b’ to account ‘a’ – the Energy Contract Volume Data specified in the Energy Contract Volume Notification (ECQzbaj)
  - If ECVNs remain extant, this will be in accordance with the ECVN volume. If the ECVN has been cancelled, will be equal to 0% - No further action

Values used in Trading Charge calculations – Prices

Price

- System Sell Price – the price determined in respect of the Final Ranked Set of System Actions in accordance with BSC Secton T4.4.3 (SSPj)
  - Issue 106 to advise on best way to determine this price– **ACTION REQUIRED**
- Offer Price – the amount in £/MWh associated with an Offer and comprising part of a Bid-Offer Pair (POnij)
  - Issue 106 to advise on best way to determine this price– **ACTION REQUIRED**
- Bid Price – the amount in £/MWh associated with a Bid and comprising part of a Bid-Offer Pair (PBnij)
  - Issue 106 to advise on best way to determine this price– **ACTION REQUIRED**
- Accepted Offer Ranking – the order of the Accepted Offer in decreasing order or price (AOnuij)
  - Issue 106 to advise on best way to determine this price– **ACTION REQUIRED**
- Information Imbalance Price – an amount equal to zero (T4.3.5) (IIPj)
  - This is zero regardless – no further action

Values used in Trading Charge calculations - Constants

Constant values

- Transmission Loss Multiplier – the factor applied to BM Unit i in Settlement Period j in order to adjust for Transmission Losses (TLMij)
- GSP Group Correction Factor – the factor by which the relevant components of GSP Group Consumption are adjusted (CFHj)
- GSP Group Correction Scaling Weight – the weighting for each Consumption Component Class used in GSP Group correction (WTN)
- Line Loss Factor – a multiplier which converts a SVA Metering System’s Consumption into its estimated value at the Grid Supply Point, that is including distribution losses (LLFLj)
- Transmission Loss Factor – the factor used to allocate transmission losses on a locational basis to BM Unit (TLFij)

These are constants, so will remain extant – no further action

POTENTIAL SOLUTIONS

Actions to resolve – Metered Volumes

Volume	Proposed Solution	Pros	Cons	Resolution
BM Unit Metered Volume (QMij)	1.Value in ECVNs and MVRNs in place before entering default and/or updated post-default	• Failed Parties best estimate of consumer demand	• May not cover full period e.g. only next 5 days • May not cover full volume e.g. if some volume will come from spot market • Is ‘gross’, rather than ‘net’ i.e. Energy Contract Volume is before Balancing actions and losses • Doesn’t account for SBMU actions	• Need to re-think calculation and sequencing • Need to apply losses to Energy Contract Volume, take off any Reallocation and apply any Balancing actions within the BMU and SBMU actions
	2.Base on Demand Disconnection process	• Established and accepted process over Z days in the past used in Settlement	• Based on averages, so has in-built errors • Doesn’t allow for SBMU variations or Balancing actions	• Disconnection Volume is only 4 weeks – average over longer period • Apply Balancing actions and SBMU actions
	3.Estimated data from LSS (SVA) and CDCA (CVA)	• Established and accepted process used in Settlement	• Based on averages from past • Doesn’t allow for SBMU variations or Balancing actions	• BSCCo is working on making CVA estimation better
	4.Combination of all of the above	• Validates one methodology against the other	• Essentially four solutions instead of one	• Potentially more accurate to average above three without adjustment then adjust for losses, and SBMU actions if necessary

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Which of the three options is preferred?

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Would you prefer a single option, or all three then averaged i.e. Option 4?

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For Option 2 - how long should 'Day Z' be?

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Should 'Day Z' be everyday i.e. if a quarter – 91 days, or the same period each day of the week e.g. Period 26 every Monday for each period

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Are there any other options?

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Actions to resolve – Balancing Volumes

Balancing Volumes – Bids-Offers etc.

- In theory, Balancing actions could still be taken
- However, we need to predict what they may be

- Options:
  - Identify any patterns in Bids or Offers – averages essentially
  - Use value of zero – assume a defaulting Party won't be participating in the BM and NETSO won't dispatch them

Period FPN (FPN_{ij})

- Used in determining the Balancing Service Volume – essentially a minor part of the overall calculation
- Used if SEV isn't provided by SVAA in for SBMU and using Baseline Methodology

- Options:
  - Use QM_{ij} as determined above as a proxy value
  - Use last known FPN – but assumes all values will be the same

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Should we default to 'zero' for Balancing Volumes?

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If not zero, how can we predict them?

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Should we use the predicted QM_{ij} value as proxy of the FPN_{ij} value?

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If not QM_{ij} as substitute for FPN_{ij}, what should we do?

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Actions to resolve – Prices

- No way to accurately predict Prices
- Need to determine a price based on what we think will happen

System Sell Price

- Trying to predict would be very complicated:
    - Use of NETSO predictions for demand
    - Try and determine predicted demand for each BM Unit (maybe using QM_{ij} methodology?)
    - Compare ECVNs, and NEMO data against predicted BM Unit Demand to determine any difference (Imbalance)
    - Predict how imbalance will be addressed by NETSO – quite difficult – to determine the ranking order
    - Predict how much other BM participants may submit
- As seen in previous Issue Group, CAP tracks SSP reasonably well
- Issue group was against using automated CAP and prefer for CC to have determination
- Suggest use CAP as proxy for SSP – use same methodology

Bid-Offer prices

- If we assume there will be no volumes, then we should assume no prices
- For the purposes of predicting Trading charges, Bid-Offer prices should be zero - £0/MWh

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Should the CAP be used for SSP$_j$?

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Should the CAP be determined the same way as it is now?

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Should the Credit Committee still determine the CAP/Predicted SSP$_j$?

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If not the CAP – should we investigate ways to calculate a predicted SSP_j?

If so, what should we consider?

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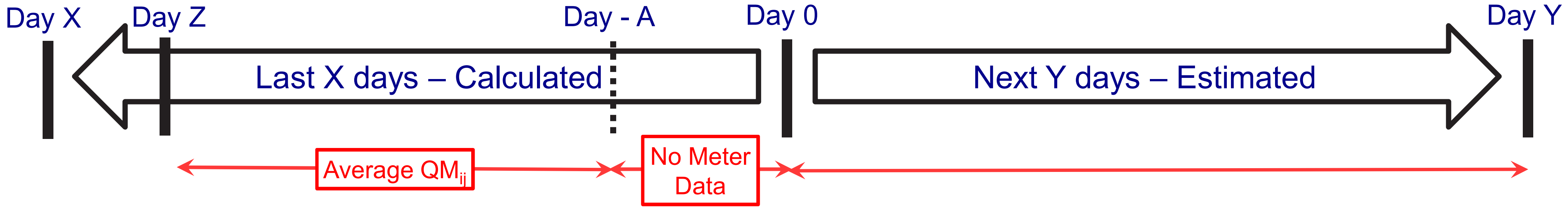
CALCULATING CREDIT COVER

ELEXON

Process to Calculate minimum Predicted Credit Cover

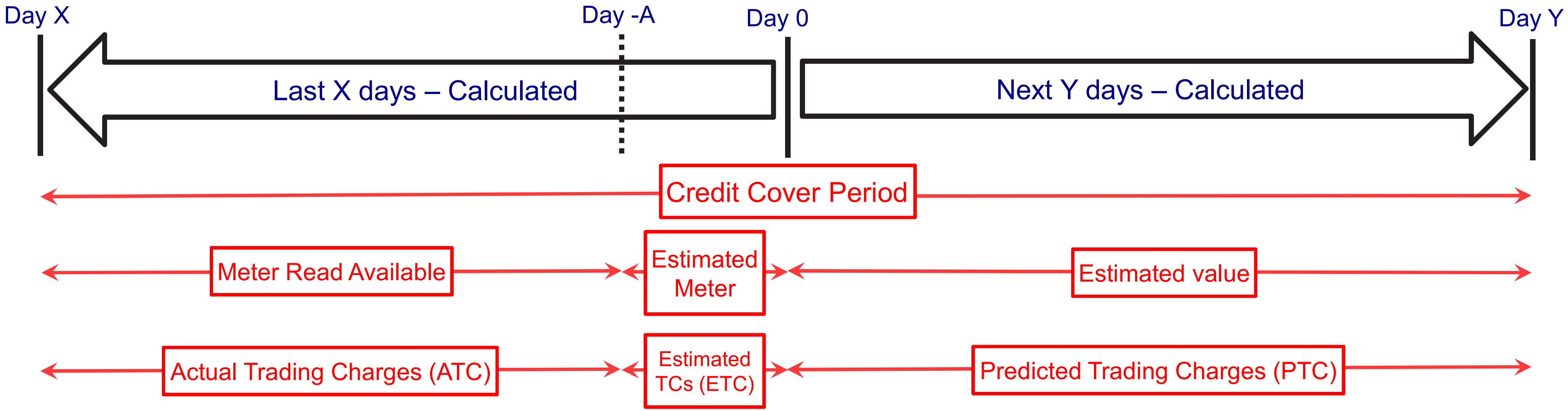
- Calculated by ECVAA each day same time as back ward looking
- If using third option/all options - Calculate average BM Unit Metered Volume (QM_{ij}) from 'Day – A' backwards for Z days



16 May	23 May	30 May	6 Jun	13 Jun	20 Jun	27 Jun	4 Jul	11 Jul	18 Jul	25 Jul	1 Aug	8 Aug	Average
14	16	15	18	23	14	16	15	23	22	24	19	15	18

- Using the value calculated for QM_{ij} to calculate predicted Trading Charges i.e. where Trading Charges formulas call for a value of QM_{ij}, use the value calculated
- The predicted System Sell Price (SSP_{ij}) will be updated with the same periodicity as the CAP
- Where Trading Charges call for a Balancing Volume – use Zero. Where they call for a Balancing Price – use Zero
  - ECVAA will use the price in force at the time of calculation
- ECVAA applies credit rating adjustment [to follow] to Predicted Credit Cover
- BSCCo follows Credit default process if triggered

Proposed Credit Calculations Summary



Estimated Trading Charges (ETC) + Actual trading Charges (ATC) + Predicted Trading Charges (PTC) = Total Trading Charges (TCC)

ETC + ATC + PTC = TTC

CREDIT RISK PROFILES

Credit Risk Profiles and Risk Criteria

- Parties should have enough collateral to cover as much outstanding unpaid Trading Charges as possible in case of Default.

- In regards to what collateral amount Parties should lodge to cover unpaid Trading Charges. Treating all parties equally could be ineffective, may be that actual exposure does not reflect the actual risk when we relate this to individual Trading Charge amounts and characteristics.

- Parties more at risk of Default and therefore higher risk of accumulating unpaid Trading Charges should be required to hold more collateral.

- Therefore to identify this, a number of risk profiles would be created that all BSC Parties will be assigned to from Market Entry onwards.

    - This will apply from BSC accession though to market withdrawal.
    - A risk profile assessment will be carried out every six months (April/October).
    - A Parties risk profile could change based on certain risk criteria and associated parameters.
    - Risk criteria will be based on parameters around credit/payment performance, credit rating and change in market participation capacity.
    - Positive/negative factors impacting the risk criteria performance measured against the parameters could then result in a change of risk profile.

Risk Criteria

- A certain number of criteria will determine the overall risk exposure of a Party which in turn will determine what risk profile is assigned.

    - Credit rating score (As defined by Moody’s or other credit agencies).
    - Current market participation role.
    - Exceeding 3 Events of Default relating to Credit/Payment
    - Number of times in authorised Credit Default Level 1
    - Number of time in authorised Credit Default Level 2
    - Number of Credit breaches > 80% Credit Cover Percentage
    - Number of Payment Defaults relating to Trading Charges

Risk Profiles

- The risk criteria would be measured against a set number of parameters.
    - Breaching these parameters could then assign a points value.
    - Exceeding a certain number of points would result in a change of risk profile.
    - Points could factor in a calculation formed to determine risk profile.
    - Credit Committee could have control around that calculation and input on any changes as well as risk criteria parameters on an annual basis.
- BSC Panel would have power to review and reset risk profiles.
    - If a Party is in Section H Default, Panel could review the current risk profile and have power to reset risk requirements and profiles.
    - Could be an additional resolution included in Section H.
- Risk profile could be reduced if a Parent Company Guarantee was submitted for a BSC Party.
- Should an appeals process exist for changes in risk profiles?
    - Would require significant effort given the likelihood of challenge from Parties.

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Does the Issue Group agree with the initial concept of a risk profile based approach?

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What other risk criteria could be included or would you like to see?

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FORWARD ASPECT OF CREDIT COVER - PROPOSAL 2

Forward Aspect of Credit Cover - Proposal 2

- Upon accession to the BSC, all Parties will be required to lodge a collateral amount as part of Market Entry conditions.
  - As part of accession requirements to the BSC, Parties will need to deposit a cash collateral amount.
  - The following criteria used will be:
    - Credit rating score (As defined by Moody’s or other credit agencies).
    - Market participation role upon registration.
    - Forward projections of customer numbers (Suppliers Only).

- At first risk profile assessment carried out after six months, criteria used going forwards will be:
    - Exceeding 3 Events of Default relating to Credit/Payment
    - Number of times in authorised Credit Default Level 1
    - Number of time in authorised Credit Default Level 2
    - Number of Credit breaches > 80% Credit Cover Percentage
    - Number of Payment Defaults relating to Trading Charges

- Parties in a higher risk profile will be required to hold more collateral at a higher percentage of their imbalance volume amounts.
  - Each risk profile would determine a coefficient rating which will determine percentage of imbalance charges to lodge as collateral.

- Collateral amount will be held separately to Credit Cover and will not be used as part of the day to day credit collateral requirements.
  - Funds to be held with FAA.
  - Funds can only withdrawn dependent on change to a lower risk profile.
  - Additional collateral can be deposited at any time.

Forward Aspect of Credit Cover - Proposal 2

- Using a risk based approach may be beneficial to industry as it will mean all new market entrants are required to have more robust cashflow reserves.

- The requirement to lodge collateral upon Market Entry could result in the most risk adverse parties having to lodge funds that simply are not available.

    - Creating a barrier to Market Entry.

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Does the Issue Group agree with the initial concept of proposal 2?

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FORWARD ASPECT OF CREDIT COVER - PROPOSAL 3

Forward Aspect of Credit Cover - Proposal 3

- The Credit Default threshold percentages could be allocated by Party based on risk profile.

  - Default thresholds would range from 50% - 100%.
  - For lowest risk Parties, applicable Credit Default threshold would be 100%.
  - For highest risk Parties, applicable Credit Default threshold would be 50%.
  - Each risk profile in between would denote a threshold percentage between these values.
  - Could facilitate a change in Query Period timings – Longer in business hours to deposit collateral.
  - Once Query period has expired, a party would be in Credit Default.

- By lowering the Credit Default thresholds, it minimises the amount of imbalance charges leveraged against Parties Credit collateral.

  - Riskier Parties will be in default earlier, requirement to resolve positon sooner.
  - With a shorter Query Period. Credit Default actions applied earlier means earlier intervention – Parties brought to Panel attention sooner, resolutions set sooner.

- May not completely mitigate bad debt for Defaulting Parties

  - Will not mitigate a Defaulting Party becoming unhedged and being subjected to 100% imbalance volume.
  - Once a Party Defaults, still reliant on Ofgem to complete SoLR actions as soon as possible.

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Does the Issue Group agree with the initial concept of proposal 3?

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NEXT STEPS

ELEXON

Next Steps

- Further data analysis of Level 2 Credit Default to help on decision with proposed solution
- Work Stream 5, Governance: What’s the Elexon-Ofgem handover?
- Defining the outcomes of Issue 106 so far and potential changes

FURTHER DEVELOPMENT

What is still on the agenda?

- According to the discussion plan presented, and the feedback gathered, the Issue Group should discuss the following topics during the next meetings:

Topic	Issues	WS	Meeting	Outcome
Mutualisation	Is it fair for everyone to pay one's debts? 'Looking forward' part of new Credit Cover calculation	WS 3	4	The Issue Group should discuss a risk-based approach to mutualisation
Governance	What's the Elexon-Ofgem handover? + WS 2 Further analysis for Level 2 Credit Default	WS 5 + WS 2	5	Are current enforcement mechanisms enough? Clarification on outcomes from Meeting 4.

Progression plan

Event	Date
Issue Group meeting 1	22 February 2023
Issue Group meeting 2	23 March 2023
Issue Group meeting 3	15 June 2023
Issue Group meeting 4	**15 August 2023**
Issue Group meeting 5	September/October 2023
Issue Group meeting 6	TBC (If required)
Issue Final Modification Report to Authority	TBC

ANY OTHER BUSINESS

MEETING CLOSE

THANK YOU

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15 August 2023