

Single Electricity Market

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| Final REcommendation Report  Mod\_20\_19 changing day-ahead difference quantity to day-ahead trade quantity in within-day difference charge calculations  28 November 2019 |

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Document History

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| --- | --- | --- | --- |
| **Version** | **Date** | **Author** | **Comment** |
| 1.0 | 28 Nov 2019 | Modifications Committee Secretariat | Issued to Modifications Committee for review and approval |
| 2.0 | 11 Dec 2019 | Modifications Committee Secretariat | Issued to Regulatory Authorities for final decision |

Reference Documents

|  |
| --- |
| **Document Name** |
| [Trading and Settlement Code](https://www.sem-o.com/rules-and-modifications/balancing-market-modifications/market-rules/TSC-Part-B.docx) |
| [Modification Proposal Form](https://www.sem-o.com/documents/market-modifications/Mod_20_19/Mod_20_19-ChangingDay-aheadDifferenceQuantitytoDay-aheadTradeQuantityinWithin-dayDifferenceChargeCalculations.docx) |
| [Presentation](https://www.sem-o.com/documents/market-modifications/Mod_20_19/Mod_20_19ChangingDay-aheadDifferenceQuantitytoDayAheadTradeQuantityinWithin-dayDifferenceChargeCalculations.pptx) |
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# MODIFICATIONS COMMITTEE RECOMMENDATION

## Recommended for approval– unanimous Vote

|  |  |  |
| --- | --- | --- |
| **Recommended for Approval by Unanimous Vote** | | |
| Rochelle Broderick | Supplier Alternate | Approve |
| Kevin Hannafin | Generator Member | Approve |
| Siobhain O’Neill | Assetless Alternate | Approve |
| Ian Mullins | Supplier Alternate | Approve |
| Sinead O’Hare | Generator Member | Approve |
| Jim Wynne | Supplier Member | Approve |
| Robert McCarthy | DSU Alternate | Approve |
| Cormac Daly | Generator Member | Approve |
| Andrew Burke | Supplier Member | Approve |
| Paraic Higgins (Chair) | Generator Member | Approve |

# Background

This Modification Proposal was raised by SEMO and was received by the Secretariat on the 10th October 2019. The proposal was raised and voted on at Meeting 94 on 24th October 2019.

When investigating the calculations for Difference Charges in response to a settlement query, some unintended consequences were found in relation to how the day-ahead quantities were taken into account in the within-day calculations. In particular there are aspects of the equations for the Within-Day Trade Difference Charge Quantity, and the tracking variables (Balancing and Intraday Tracked Difference Quantities) which were intended to represent the current net traded position of the unit as at or just before the trade for which the potential charge is being calculated. In these parts of the equations, the quantity included is the Day-ahead Difference Quantity, rather than the Day-ahead Trade Quantity.

This results in an incorrect outcome because the Day-ahead Difference Quantity is capped by the Obligated Capacity Quantity or the Ex-Ante Quantity, meaning if those caps apply, it is from that initial point that the calculation of the current net traded position is, rather than considering the actual traded position from day-ahead trades. The change proposed is to incorporate the Day-ahead Trade Quantity in the correct parts of the equations to replace the Day-ahead Difference Quantity, so that the correct reference point for representing the currently traded net position for the unit is calculated using the actual day-ahead trade position rather than that position capped by the Ex-Ante Quantity or Obligated Capacity Quantity.

# PURPOSE OF PROPOSED MODIFICATION

**3A.) justification of Modification**

The effect on the outcome would only be of importance where either the price for a positive balancing trade for an affected unit, or the Imbalance Settlement Price, were to be above the Strike Price. The primary scenario affected is where a unit sells at day-ahead, and then trades at intraday in a way which reduces the Ex-Ante Quantity to below the Obligated Capacity Quantity and Day-ahead Trade Quantity. In this case there may have been cause to calculate a difference charge for the unit if they received a balancing trade which brings the unit above their Ex-Ante Quantity at a price above the Strike Price, and the amount of their Obligated Capacity Quantity which they met through trades would increase to their dispatched level, but the code as it is would have prevented this charge from being calculated. The negative intraday trade being considered from a starting position of the lower position of their Ex-Ante Quantity, rather than their Day-ahead Trade Quantity, would mean that considering subsequent positive trades would be less likely to increase the Balancing Tracked Difference Quantity, and when it does it would do so by a smaller volume than intended. This means that Difference Charges related to balancing trades would be lower than intended, and the obligations considered met would be less than intended, meaning Non-Performance Difference Charges could be greater than intended where the Imbalance Settlement Price is greater than the Strike Price. Given all this, it should not affect the vast majority of periods in particular it wouldn’t affect periods where the net trade position of the unit is greater than or equal to their day-ahead trade position, or if the relevant trade prices are below the Strike Price.

This problem does not exist in the same way for Difference Payments, and it would not lead to a difference in cash flow outcomes – only a difference in the internal calculations of the quantities for QDIFFPTID. The reason for this is because supplier units cannot have subsequent negative trading quantities arise after the intraday trading which drives the value of the Ex-Ante Quantity. Since Difference Payments for ex-ante trades are capped at the Ex-Ante Quantity, and if the Ex-Ante Quantity is reducing the Difference Payment they receive for their Day-ahead Trade such that none of their Intraday Trades should receive a Difference Payment, then there is no other means by which they would be eligible to receive a Difference Payment for a traded quantity. The only other Difference Payment for which the unit would be eligible would be Imbalance Difference Payments, where the Ex-Ante Quantity is the appropriate level from which to assess the quantity eligible for this payment. This is in contrast to Difference Charges, where the units affected could have balancing market quantities in excess of their Ex-Ante Quantity arising after their ex-ante trading which would be eligible for Difference Charges and which could change the level from which they should be assessed for Non-Performance Difference Charges. Therefore the same changes do not need to be made to the Difference Payment calculation.

**3B.) Impact of not Implementing a Solution**

Although no instance of this event has been recorded to date, if this proposal is not implemented then the incorrect calculations for Within-Day Trade Different Charge described in the explanation (where caps at Obligated Capacity Quantity or Ex Ante Quantity apply) would remain, and could lead to incorrect Settlement outcomes in the future.

The materiality would depend on the Ex-Ante trade affected.

**3c.) Impact on Code Objectiv****es**

* to facilitate the efficient, economic and coordinated operation, administration and development of the Single Electricity Market in a financially secure manner:
  + The modification furthers this objective because it ensures that the market design as intended to give particular market signals and incentives around reliability is implemented through the exact equations in the settlement of the Capacity Market, in this case that the relevant quantities are subject to Difference Charges and Payments to the correct extent.
* to ensure no undue discrimination between persons who are parties to the Code:
  + The modification furthers this objective because it removes different unintended treatment of units for a particular set of scenarios. The intended treatment is that trade quantities which increase the net traded position of the unit towards their capacity obligation would count towards meeting that obligation and would be subject to Difference Charges at the price for which it is settled, however the code currently prevents this from happening in situations where the Ex-Ante Quantity is less than the Day-ahead Trade Quantity.

# Working Group and/or Consultation

N/A

# impact on systems and resources

Change required to Market Operators Settlement system to implement amended algebra

# Impact on other Codes/Documents

N/A

# MODIFICATION COMMITTEE VIEWS

## Meeting **94 – 24 october 2019**

SEMO delivered a [presentation](https://www.sem-o.com/documents/market-modifications/Mod_20_19/Mod_20_19ChangingDay-aheadDifferenceQuantitytoDayAheadTradeQuantityinWithin-dayDifferenceChargeCalculations.pptx) on this proposal summarising that the proposed Modifications was a correction to the algebra for the calculation of Within-Day Difference Charges.

As Day Ahead Difference Quantity as opposed to Day Ahead Trade Quantity is used in the calculation there is an issue with potentially getting the wrong answer from these calculations in some niche scenarios, although this has not manifested materially to date. This is because Day Ahead Difference Quantity can be capped by Ex Ante Quantity or Obligated Capacity Quantity which is inappropriate for the use in Within-Day Difference Charge Calculations This issue only affects where there is an RO event and a particular trading pattern. The rules can result in difference charges being understated were this to manifest. The proposal is intended to further the code objectives related to ensure no undue discrimination and efficient, economic and coordinated operation of the SEM.

The Chair questioned whether an alternative implementation was possible which SEMO advised would not be viable. The committee agreed to move to a vote.

# Proposed Legal Drafting

As set out in Appendix 1.

# LEGAL REVIEW

# IMPLEMENTATION TIMESCALE

It is proposed that this Modification is implemented as the Modifications Committee have Recommended it for Approval. This Modification requires system changes and as such it is recommended that it is made effective from the first Settlement Day following delivery of the associated system changes.

# Appendix 1: Mod\_20\_19 Changing day-ahead difference quantity to day-ahead trade quantity in within-day difference charge calculations

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| --- | --- | --- | --- | --- | --- |
| **MODIFICATION PROPOSAL FORM** | | | | | |
| **Proposer**  *(Company)* | **Date of receipt**  *(assigned by Secretariat)* | | **Type of Proposal**  *(delete as appropriate)* | | **Modification Proposal ID**  *(assigned by Secretariat)* |
| **SEMO** | **10 October 2019** | | **Standard** | | **Mod\_20\_19** |
| **Contact Details for Modification Proposal Originator** | | | | | |
| **Name** | | **Telephone number** | | **Email address** | |
| **Martin Kerin** | |  | | **Martin.Kerin@EirGrid.com** | |
| **Modification Proposal Title** | | | | | |
| **Changing Day-ahead Difference Quantity to Day-ahead Trade Quantity in Within-day Difference Charge Calculations** | | | | | |
| **Documents affected**  *(delete as appropriate)* | | **Section(s) Affected** | | **Version number of T&SC or AP used in Drafting** | |
| **T&SC Part B** | | **F.18.5** | | **Version 21** | |
| **Explanation of Proposed Change**  *(mandatory by originator)* | | | | | |
| When investigating the calculations for Difference Charges in response to a settlement query, some unintended consequences were found in relation to how the day-ahead quantities were taken into account in the within-day calculations. In particular there are aspects of the equations for the Within-Day Trade Difference Charge Quantity, and the tracking variables (Balancing and Intraday Tracked Difference Quantities) which were intended to represent the current net traded position of the unit as at or just before the trade for which the potential charge is being calculated. In these parts of the equations, the quantity included is the Day-ahead Difference Quantity, rather than the Day-ahead Trade Quantity.  This results in an incorrect outcome because the Day-ahead Difference Quantity is capped by the Obligated Capacity Quantity or the Ex-Ante Quantity, meaning if those caps apply, it is from that initial point that the calculation of the current net traded position is, rather than considering the actual traded position from day-ahead trades. The change proposed is to incorporate the Day-ahead Trade Quantity in the correct parts of the equations to replace the Day-ahead Difference Quantity, so that the correct reference point for representing the currently traded net position for the unit is calculated using the actual day-ahead trade position rather than that position capped by the Ex-Ante Quantity or Obligated Capacity Quantity. | | | | | |
| **Legal Drafting Change**  *(Clearly show proposed code change using* ***tracked*** *changes, if proposer fails to identify changes, please indicate best estimate of potential changes)* | | | | | |
| F.18.5.5 The Market Operator shall calculate the Within-day Trade Difference Quantity (QDIFFCTWDΩγk), the Within-day Trade Difference Charge (CDIFFCTWDΩγk), the Intraday Tracked Difference Quantity (QDIFFTRACKIDΩγk) and the Balancing Tracked Difference Quantity (QDIFFTRACKBΩγk) for each Capacity Market Unit, Ω, which does not represent an Autoproducer Unit, in ascending order of each position, k, in the ranked set derived in accordance with paragraph **Error! Reference source not found.**, in Imbalance Settlement Period, γ, as follows:  where:   * + - * 1. is a summation over values across all positions in the ranked set prior to and including the current position, k, in the ranked set. Calculations for the first position, (k = 1), will not have a previous position, k’, and the result for this sum shall be the value in the current position, k, in the ranked set;         2. is a summation over values across all positions in the ranked set prior to the current position, k, in the ranked set. Calculations for the first position, (k = 1), will not have a previous position, k’, and the result for this sum shall be zero;         3. is a summation over all Generator Units, u, which comprise the Capacity Market Unit, Ω;         4. QCOBΩγ is the Obligated Capacity Quantity for Capacity Market Unit, Ω, in Imbalance Settlement Period, γ;         5. QDIFFDAΩγ is the Day-ahead Difference Quantity for Capacity Market Unit, Ω, in Imbalance Settlement Period, γ;         6. QTIDuγk is the Intraday Trade Quantity for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         7. QTBuγk is the Balancing Trade Quantity for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         8. QEXuγ is the Ex-Ante Quantity for Generator Unit, u, in Imbalance Settlement Period, γ;         9. PTIDuγk is the Intraday Trade Price associated with the Intraday Trade Quantity (QTIDuγk) for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         10. PTBuγk is the Balancing Trade Price associated with the Balancing Trade Quantity (QTBuγk) for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         11. PSTRm is the Strike Price for Month, m, which contains Imbalance Settlement Period, γ;         12. (k – 1) is for the previous position in the ranked set;         13. (k = 0) is for the 0th position in the ranked set, i.e. where a calculation is being performed on the first position in the ranked set, (k = 1), for which there is no previous position;         14. qTDAxuh is the Day-ahead Trade Quantity for Day-ahead Trade, x, for Generator Unit, u, in Day-ahead Trading Period, h;         15. DTDAx is the Day-ahead Trade Duration of Trade, x;         16. DISP is the Imbalance Settlement Period Duration; and         17. is a summation of the quantities for each Trade, x, from the day-ahead market or the intraday market, as the case may be within whose Day-ahead Trading Period or Intraday Trading Period, h, as the case may be, the Imbalance Settlement Period, γ, falls in whole or in part.   F.18.5.9 The Market Operator shall calculate the Within-day Trade Difference Quantity (QDIFFCTWDsγk), the Within-day Trade Difference Charge (CDIFFCTWDsγk), the Intraday Tracked Difference Quantity (QDIFFTRACKIDsγk), and the Balancing Tracked Difference Quantity (QDIFFTRACKBsγk), for each Trading Site, s, which is associated with a Capacity Market Unit, Ω, which represents an Autoproducer Unit, in ascending order of each position, k, in the ranked set derived in accordance with paragraph **Error! Reference source not found.**, in Imbalance Settlement Period, γ, as follows:  where:   * + - * 1. is a summation over values across all positions in the ranked set prior to and including the current position, k, in the ranked set. Calculations for the first position, (k = 1), will not have a previous position, k’, and the result for this sum shall be the value in the current position, k, in the ranked set;         2. is a summation over values across all positions in the ranked set prior to the current position, k, in the ranked set. Calculations for the first position, (k = 1), will not have a previous position, k’, and the result for this sum shall be zero;         3. is a summation over all Generator Units, u, in the Trading Site, s;         4. QMDIFFCWDsγ is the Within-day Difference Charge Metered Quantity for Trading Site, s, in Imbalance Settlement Period, γ;         5. QCOBsγ is the Obligated Capacity Quantity for Trading Site, s, in Imbalance Settlement Period, γ;         6. QDIFFDAsγ is the Day-ahead Difference Quantity for Trading Site, s, in Imbalance Settlement Period, γ;         7. QTIDuγk is the Intraday Trade Quantity for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         8. QTBuγk is the Balancing Trade Quantity for Generator Unit, u, in the position, k, in the ranked set at rank, k, in Imbalance Settlement Period, γ;         9. QEXuγ is the Ex-Ante Quantity for Generator Unit, u, in Imbalance Settlement Period, γ;         10. PTIDuγk is the Intraday Trade Price associated with the Intraday Trade Quantity (QTIDuγk) for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         11. PTBuγk is the Balancing Trade Price associated with the Balancing Trade Quantity (QTBuγk) for Generator Unit, u, in the position, k, in the ranked set, in Imbalance Settlement Period, γ;         12. PSTRm is the Strike Price for Month, m, which contains Imbalance Settlement Period, γ;         13. (k – 1) is for the previous position in the ranked set;         14. (k = 0) is for the 0th position in the ranked set, i.e. where a calculation is being performed on the first position in the ranked set, (k = 1), for which there is no previous position;         15. qTDAxuh is the Day-ahead Trade Quantity for Day-ahead Trade, x, for Generator Unit, u, in Day-ahead Trading Period, h;         16. QMDIFFCDAsγ is the Day-ahead Difference Charge Metered Quantity for Trading Site, s, in Imbalance Settlement Period, γ;         17. DTDAx is the Day-ahead Trade Duration of Trade, x;         18. DISP is the Imbalance Settlement Period Duration; and         19. is a summation of the quantities for each Trade, x, from the day-ahead market or the intraday market, as the case may be within whose Day-ahead Trading Period or Intraday Trading Period, h, as the case may be, the Imbalance Settlement Period, γ, falls in whole or in part. | | | | | |
| **Modification Proposal Justification**  *(Clearly state the reason for the Modification)* | | | | | |
| The effect on the outcome would only be of importance where either the price for a positive balancing trade for an affected unit, or the Imbalance Settlement Price, were to be above the Strike Price. The primary scenario affected is where a unit sells at day-ahead, and then trades at intraday in a way which reduces the Ex-Ante Quantity to below the Obligated Capacity Quantity and Day-ahead Trade Quantity. In this case there may have been cause to calculate a difference charge for the unit if they received a balancing trade which brings the unit above their Ex-Ante Quantity at a price above the Strike Price, and the amount of their Obligated Capacity Quantity which they met through trades would increase to their dispatched level, but the code as it is would have prevented this charge from being calculated. The negative intraday trade being considered from a starting position of the lower position of their Ex-Ante Quantity, rather than their Day-ahead Trade Quantity, would mean that considering subsequent positive trades would be less likely to increase the Balancing Tracked Difference Quantity, and when it does it would do so by a smaller volume than intended. This means that Difference Charges related to balancing trades would be lower than intended, and the obligations considered met would be less than intended, meaning Non-Performance Difference Charges could be greater than intended where the Imbalance Settlement Price is greater than the Strike Price. Given all this, it should not affect the vast majority of periods, in particular it wouldn’t affect periods where the net trade position of the unit is greater than or equal to their day-ahead trade position, or if the relevant trade prices are below the Strike Price.  This problem does not exist in the same way for Difference Payments, and it would not lead to a difference in cash flow outcomes – only a difference in the internal calculations of the quantities for QDIFFPTID. The reason for this is because supplier units cannot have subsequent negative trading quantities arise after the intraday trading which drives the value of the Ex-Ante Quantity. Since Difference Payments for ex-ante trades are capped at the Ex-Ante Quantity, and if the Ex-Ante Quantity is reducing the Difference Payment they receive for their Day-ahead Trade such that none of their Intraday Trades should receive a Difference Payment, then there is no other means by which they would be eligible to receive a Difference Payment for a traded quantity. The only other Difference Payment for which the unit would be eligible would be Imbalance Difference Payments, where the Ex-Ante Quantity is the appropriate level from which to assess the quantity eligible for this payment. This is in contrast to Difference Charges, where the units affected could have balancing market quantities in excess of their Ex-Ante Quantity arising after their ex-ante trading which would be eligible for Difference Charges and which could change the level from which they should be assessed for Non-Performance Difference Charges. Therefore the same changes do not need to be made to the Difference Payment calculation. | | | | | |
| **Code Objectives Furthered**  *(State the Code Objectives the Proposal furthers, see Section 1.3 of Part A and/or Section A.2.1.4 of Part B of the T&SC for Code Objectives)* | | | | | |
| * to facilitate the efficient, economic and coordinated operation, administration and development of the Single Electricity Market in a financially secure manner:   + The modification furthers this objective because it ensures that the market design as intended to give particular market signals and incentives around reliability is implemented through the exact equations in the settlement of the Capacity Market, in this case that the relevant quantities are subject to Difference Charges and Payments to the correct extent. * to ensure no undue discrimination between persons who are parties to the Code:   + The modification furthers this objective because it removes different unintended treatment of units for a particular set of scenarios. The intended treatment is that trade quantities which increase the net traded position of the unit towards their capacity obligation would count towards meeting that obligation and would be subject to Difference Charges at the price for which it is settled, however the code currently prevents this from happening in situations where the Ex-Ante Quantity is less than the Day-ahead Trade Quantity. | | | | | |
| **Implication of not implementing the Modification Proposal**  *(State the possible outcomes should the Modification Proposal not be implemented)* | | | | | |
| Although no instance of this event has been recorded to date, if this proposal is not implemented then the incorrect calculations for Within-Day Trade Different Charge described in the explanation (where caps at Obligated Capacity Quantity or Ex Ante Quantity apply) would remain, and could lead to incorrect Settlement outcomes in the future.  The materiality would depend on the Ex-Ante trade affected. | | | | | |
| **Working Group**  *(State if Working Group considered necessary to develop proposal)* | | | **Impacts**  *(Indicate the impacts on systems, resources, processes and/or procedures; also indicate impacts on any other Market Code such as Capacity Market Code, Grid Code, Exchange Rules etc.)* | | |
| No | | | Change required to Market Operators Settlement system to implement amended algebra | | |
| ***Please return this form to Secretariat by email to*** [balancingmodifications@sem-o.com](mailto:balancingmodifications@sem-o.com) | | | | | |