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## **SEM Market Audit**

Independent Market Auditor's Report  
For the period ended 31 December 2020

Date: 16 June 2021



## Market Auditor Report – Notice re Distribution and Publication

This notice concerns the Market Auditor Report to the Commission for Regulation of Utilities (CRU) and the Utility Regulator (UR) (together the Regulatory Authorities (the RAs)) on the SEM Market Audit for the 12 months ended 31 December 2020 dated 16 June 2021 (the "Report").

This notice does not apply to the RAs or Parties to the Code who have signed the "Terms of Release to the Parties to the Code" letter (including their employees acting within the scope of their employment duties).

The requirement for the Market Audit is set out in The Single Electricity Market (SEM) Trading & Settlement Code ("the Code") designated on 3 July 2007 and as amended from time to time. This Report was prepared by Deloitte Ireland LLP (a partnership established in Ireland and with its registered address at Deloitte & Touche House, Earlsfort Terrace, Dublin 2, Ireland) ("Deloitte").

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No work has been carried out nor have any enquiries of RAs or Single Electricity Market Operator management been made since 11 March 2021. The Report does not incorporate the effects, if any, of any events or circumstances which may have occurred or information which may have come to light subsequent to that date. Deloitte makes no representation as to whether, had Deloitte carried out such work or made such enquiries; there would have been any material effect on the Report. Further, Deloitte has no obligation to notify you if any matters come to its attention which might affect the continuing validity of the comments or conclusions in the Report.

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Unless otherwise stated, all terms and expressions used in this notice shall have the same meaning attributed to them in the Code.

This notice shall be governed and construed in accordance with the laws of Ireland. The courts of Ireland will have exclusive jurisdiction to settle any claim, dispute or difference which may arise out of or in connection with this notice.

# Contents

|          |   |          |
|----------|---|----------|
| <b>1</b> | <b>INTRODUCTION .....</b>                 | <b>1</b> |
| <b>2</b> | <b>MARKET AUDITOR CONCLUSION .....</b>    | <b>3</b> |
| <b>3</b> | <b>MATERIAL ISSUES .....</b>              | <b>7</b> |
| <b>4</b> | <b>REPORT OF SIGNIFICANT ISSUES .....</b> | <b>8</b> |
| <b>5</b> | <b>OTHER MATTERS ARISING.....</b>         | <b>9</b> |

# 1 Introduction

## 1.1 Background

The Single Electricity Market ("SEM") was developed by the Commission for Regulation of Utilities ("The Commission" or "CRU") and the Utility Regulator ("UR"), together the Regulatory Authorities ("RAs"). The Single Electricity Market Operator ("SEMO") is responsible for the operation of the SEM. The Trading and Settlement Code ("TSC" or "the Code") was developed as part of the process of establishing the SEM and constitutes the trading and settlement arrangements for the SEM.

The Regulatory Authorities have engaged Deloitte as Market Auditor to undertake a Market Audit of the Code, its operations and implementation and the operations, trading arrangements, procedures and processes under the Code. The requirement for a Market Audit is set out in section B.16.1 of the Code. As required under the Code the RAs consulted on the scope of the Market Audit resulting in the publication of the Terms of Reference for the Market Audit (SEM-20-060) on 10 September 2020 ("TOR").

As defined in the TOR the scope of the Market Audit focused on the activities of SEMO under the Code and associated Agreed Procedures and covered the systems and processes within the control of SEMO. The TOR require that the audit is reported under ISAE 3000 Assurance Opinion, and covers the following areas:

- Accession & Registration
- Imbalance Settlement Price Calculation and Recalculation
- Settlement Production and Reruns (to include all of the Market Operator Charges)
- Currency and balancing charges
- Invoices, payments and credit cover
- Queries and disputes
- Code development
- Information publication
- Communication channels, systems and operation

Unless otherwise specified, words and expressions used in this document have the same meaning as defined in the Code.

# Introduction (Continued)

## 1.2 Requirement for Market Audit

The requirement for a Market Audit of the Code is set out in section B.16 of the Code in paragraphs B.16.1.1 to B.16.1.13. As specified in the Terms of Reference it covers the 12 months from 1 January 2020 to 31 December 2020.

## 1.3 Report Structure

Section 2 contains our Market Audit Conclusion. The Market Audit Scope was agreed by the Regulatory Authorities in accordance with the Terms of Reference.

It has been agreed with the Regulatory Authorities that materiality should be set at 0.25% of estimated annual market value. Planning materiality for the Market Audit has therefore been set at €2.2m and it will be for Parties to the Code themselves to evaluate the financial impact of any errors or matters arising on their own businesses.

Section 3 contains details of the Material Issues identified during the course of the audit.

Section 4 contains our Report of Significant Issues, setting out matters identified during the course of the audit which, while not material in the context of the audit, may have a significant impact on Parties to the Code. Where, in our judgement, matters arising may be significant to individual parties such matters have been included in the Significant Issues Report with sufficient detail so as to allow the RAs and Parties to the Code to evaluate the impact of the cause and circumstances of matters reported. Qualitative and quantitative factors were taken into account when determining the significance of an issue. From a quantitative perspective, a threshold of 10% of the materiality value has been applied as a general guideline in determining whether a matter should be included in the Significant Issues Report. The resolution response for each of these points was provided by SEMO.

Section 5 contains details of Other Matters Arising which we wish to bring to the attention of the market. They do not represent issues of significant non-compliance however we include this section, as we believe it may assist the RAs and Parties to the Code to judge for themselves the relative significance of all points reported.



## 2 Market Auditor Conclusion

Independent Market Auditor's Assurance Report to the Commission for Regulation of Utilities ("The Commission" or "CRU") and the Utility Regulator ("UR") (together "The RAs")

We have performed assurance work over the extent to which the Single Electricity Market Operator ("SEMO") has complied with Part B of the Trading and Settlement Code ("Code") and relevant Agreed Procedures as defined in the "Terms of Reference for the Market Audit 2020" published by the RAs on 10 September 2020, during the 12 month period ending 31 December 2020. The engagement has been performed in accordance with ISAE 3000 (Revised) "Assurance Services Engagements other than Audits or Reviews of Historical Financial Information" ("ISAE 3000") issued by the International Auditing and Assurance Standards Board. In the context of this engagement the terms "Audit" and "Market Audit" mean a reasonable assurance engagement performed in accordance with (ISAE) 3000.

This report is made solely for the RAs, as a body, in accordance with paragraph B.16.1.3 of the Code. Our work has been undertaken so that we might state to the RAs those matters we are required to state to them in a reasonable assurance report in accordance with ISAE 3000 and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the RAs and the Parties as a body, for our work, for this report, or for the conclusions we have formed. Parties to the Code may only rely on this report if they have agreed in writing to be bound by the conditions under which it has been prepared, in line with the engagement letter.

Unless otherwise specified, words and expressions used in this report have the same meaning as defined in the Code.

Responsibilities of the Single Electricity Market Operator, RAs and Parties to the Code (together the "Responsible Party")

The Code is a legal agreement which, inter alia, sets out the terms of the trading and settlement arrangements for the sale and purchase of wholesale electricity on the island of Ireland between participating generators and suppliers ("Single Electricity Market"). The Code defines the Rules and Agreed Procedures, which are required to be followed by the signatories to the Code ("Parties") who are bound by its provisions.

The functions of the RAs are set out in the Electricity Regulation Act 1999, the Northern Ireland (Miscellaneous Provisions) Act 2006 and in the Code. In the context of the Market Audit, the role of the RAs as the Responsible Party is to appoint the Market Auditor and agree the terms of the Market Auditor's appointment, consult on and issue the Terms of Reference for the Market Audit, and receive Market Audit Reports.

SEMO is responsible for the operation of the Single Electricity Market ("SEM") under the Code as set out in paragraph A.1.1.4 therein and for complying with the requirements of the Code and Agreed Procedures as listed in appendix D to the Code, insofar as they are applicable to the SEMO.

The responsibilities of the Parties in respect of the Market Audit are set out in paragraph B.16 of the Code, which requires parties to provide without charge to the Market Auditor in a timely manner, subject to any obligations of confidentiality, such information as is reasonably required by the Market Auditor to enable the Market Auditor to comply with the functions and obligations and Terms of Reference for the purposes of conducting the audit and preparing and finalising the Audit Report. A person may only become a Party to the Code in accordance with the terms of the Code and the Framework Agreement.

# Market Auditor Conclusion (Continued)

## Responsibilities of the Market Auditor

The requirements for the Market Audit are set out in paragraphs B.16.1.1 to B.16.1.13 of the Code, in particular paragraph B.16.1.3 of the Code which sets out that "The Market Auditor shall conduct an audit of the code, its operation and implementation and the operations, trading arrangements, procedures and processes under this Code at least once a year". It is our responsibility as Market Auditor to execute the Market Audit as required under the Code and as set out in the Terms of Reference for the Market Audit 2020 and provide a reasonable assurance report thereon. We comply with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, or equivalent code, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

We apply International Standard on Quality Control 1 and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and RAs requirements.

We further include issues not considered material / significant, based on the stipulated levels, that are considered of interest to parties to the Code in the "Other Matters" section of the report.

## Limitations and exclusions from scope

The Terms of Reference, as quoted below, for the 2020 Market Audit expressly excludes certain components from the scope of the Market Audit.

- The Market Audit will only cover the actions taken by SEMO in regard to delivering their obligations in compliance with that specified in the TSC. It will not cover any contractual or commercial arrangements between SEMO and other bodies, or if the method used to achieve the requirement was optimal, as this is considered out of scope.
- Any decision processes upon derogations or amendments to the TSC are out of scope for the audit. The audit will only look at SEMO's operation of any such derogations or amendments (if they have been implemented over the audit period).
- The Market Audit will not be expanded to include the TSO's compliance with its Scheduling and Dispatch Process.

We draw attention to the Market Operator Performance Reports which lists all Code breaches identified by SEMO. The Market Operator Performance Reports are issued by SEMO and are available on its website. In addition, SEMO maintains a Known Issues Report, which is also available on its website.

# Market Auditor Conclusion (Continued)

## Basis of assurance conclusion

We conducted our assurance work in accordance with ISAE 3000. That standard requires that we plan and perform our work to obtain appropriate evidence about the subject matter of the engagement sufficient to support a conclusion providing reasonable assurance when evaluated against the applicable criteria. In the context of the Market Audit, the subject matter consists of relevant activities of the SEMO which are evaluated against the relevant paragraphs of the Code and applicable Agreed Procedures as set out in the Terms of Reference for the Market Audit 2020.

Our assurance work included examination, on a test basis, of evidence relevant to the Code and Agreed Procedures including the review of risks, control objectives and controls associated with the SEMO's performance of their duties and operation of the settlement arrangements. Our testing of the controls comprised review of documentation, corroborative enquiry with key SEMO staff and, on a sample basis, testing the operation of controls and the validity and accuracy of the calculations underlying settlement output.

We planned and performed our assurance work so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the SEMO has complied with the Code and relevant Agreed Procedures as defined in the Terms of Reference for the Market Audit 2020.

We were not required to carry out an audit conducted in accordance with International Standards on Auditing (Ireland). Consequently, our conclusion is not expressed as an audit opinion.

For the purpose of our conclusion a qualification, in terms of material non-compliance with the Rules and relevant Agreed Procedures of the Code, would arise if the financial impact of errors identified individually or in aggregate exceeded the materiality value as set out in section 1.3 above or where we considered the breach to be of such significance that it undermined the robust operation of the settlements process.

We have prepared a Report of Significant Issues which is attached to this conclusion setting out matters identified during the course of the audit which, while not material in the context of the audit, may have a significant impact for Parties to the Code. Our conclusion should be read in conjunction with the Report of Significant Issues, but is not qualified in respect of matters contained within the Report of Significant Issues.

## Qualified Conclusion

On the basis set out above and subject to the exclusions noted in the Responsibilities of the Market Auditor section above, except for the effect of the matters described in the Basis for Qualified Conclusion section of our report, (in respect of certain quantities relating to the interconnector), during the period from 1 January 2020 to 31 December 2020 the SEMO has, in all material respects, complied with the Code and relevant Agreed Procedures as set out in the "Terms of Reference for the Market Audit 2020" published by the RAs on 10 September 2020.

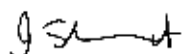


# Market Auditor Conclusion (Continued)

## Basis for Qualified Conclusion

During the period 1 January 2020 – 31 December 2020 the SEMO settlement systems did not correctly apply the requirement of the TSC in respect of the calculation of certain quantities related to interconnector units. Specifically:

1. Non-compliance with paragraphs F.4.3.3 and F.4.3.4 in relation to application of combined loss adjustment factors in respect of interconnector units, specifically the requirement to divide the non-adjusted variable by the loss factor when the variable was negative was not applied.
  - The issue was previously identified by SEMO and communicated to the Market in the Known Issue Report.
  - The issue was resolved in Release F of the Central system in relation to metered quantities on 4 November 2020, the issue has not yet been resolved in respect of the calculation of the accepted bid and offer quantities.
  - These errors resulted in incorrect calculation of imbalance, premium component and discount component payments/charges with a total impact during the audit period of €4.4m.
  - As at 31 December 2020 the uncorrected error arising from these issues (i.e. the error that had not been corrected though resettlement conducted after 4 November 2020) was €3.7m, which is above the defined level of materiality.
  - The remaining error is expected to be corrected through scheduled resettlement over the course of 2021.
2. Non-compliance with paragraphs F.6.7.3 in relation to the calculation of the Biased Accepted Bid Quantity for Interconnector residual capacity units, due to defects causing a mismatch in data mapping in the underlying calculations.
  - This issue was previously identified by SEMO and communicated to the Market in the Known Issue Report.
  - The issue was resolved through a hot fix on 2 September 2020.
  - This resulted in errors in the calculation of premium component, discount component and curtailment payments/charges with a total impact during the audit period of €4.3m.
  - As at 31 December 2020 the uncorrected error arising from these issues (i.e. the error that had not been corrected though resettlement conducted after 2 September 2020) was €2.6m, which is above the defined level of materiality .
  - The remaining error is expected to be corrected through scheduled resettlement over the course of 2021.



For and on behalf of  
Deloitte Ireland LLP  
Chartered Accountants  
Deloitte & Touche House  
29 Earlsfort Terrace  
Dublin 2

Date: 16 June 2021

## 3 Material Issues

| Issue  | Effect  | SEMO Response   |
|--|---|---|
| <b>Settlement Production and Reruns</b>  |   |   |
| <b>3.1 Incorrect application of Combined Loss Adjustment Factor (FCLAF) to Interconnector Units</b>  |   |   |
| <p>A known issue exists in relation to SEMO systems incorrectly applying loss adjustment factors for interconnector units when the associated variable is negative.</p> <p>This had been identified by SEMO as a known defect (139479 / CR092). A fix was applied to correct the application of loss factors to QM in Release F on 4 November 2020. The defect remains in the system for the application of loss factors to QAO and QAB as at 31 December 2020.</p> <p>During our testing we observed differences for interconnector units in multiple calculations and multiple testing dates selected in respect of the calculation of loss adjusted values of Metered Quantity (QM), Accepted Offer Quantity (QAO) and Accepted Bid Quantity (QAB) due to this issue.</p> | <p>This represents a non-compliance with TSC Part B F.4.3.3 and F.4.3.4.</p> <p>The following charges are affected:</p> <ul style="list-style-type: none"> <li>• Imbalance Component Payment (CIMB)</li> <li>• Discount Component Payment (CDISCOUNT)</li> <li>• Premium Component Payment (CPREMIUM)</li> </ul> <p>The estimated impact across the three charges for the audit period is a net underpayment by interconnector units of €3.7m, net of funds recovered through resettlement during the year.</p> | <p>Accepted. SEMO was aware of and discovered this issue. It featured on our known issues report. The issue was resolved in release F in relation to metered quantities on 4th November which is the most material part of the issue (97% of the issue). The remaining 3% of the issue in relation to accepted bid and offer quantities is prioritised for Release H (CR-247) which will be delivered in November 21. Resettlement has commenced and it is expected to be fully resettled by the last SD in August 2021 i.e. M13 is running on schedule and as per TSC. €2m of the defect has been resettled to date in M+4 and M13 Resettlement.</p> |
| <b>3.2 Incorrect calculation of Biased Accepted Bid Quantity (QABBIAS) for Interconnector Residual Capacity Units (IRCUs)</b>  |   |   |
| <p>A known issue exists in relation to calculation of QABBIAS for IRCUs due to an existing known defect (147080 / 6110) identified by SEMO. This defect causes a mismatch in data mapping in the underlying calculations and was corrected through a hot fix on 2 September 2020.</p> <p>We observed differences in our calculation of QABBIAS for IRCUs across two testing dates selected due to this issue.</p>  | <p>The following payments/charges were impacted:</p> <ul style="list-style-type: none"> <li>• CDISCOUNT</li> <li>• CPREMIUM</li> </ul> <p>For the audit period the estimated impact was €2.6m, as at 31 December 2020, net of funds recovered through resettlement during the year.</p>   | <p>Accepted. SEMO was aware of and discovered this issue. It featured on our known issues report. The issue was resolved in a hot fix on 2nd September. Resettlement has commenced and it is expected to be fully resettled by 25th June 2021 i.e. M13 is running on schedule and as per TSC. Resettlement to date of this issue amounts to €1.8m in M+4.</p>   |

## 4 Report of Significant Issues

| Issue   | Effect  | SEMO Response   |
|---|---|---|
| <b>Settlement Production and Reruns</b>   |   |   |
| <b>4.1 Capacity Settlement FX Rate</b>  |   |   |
| <p>Capacity Payment (CCP), Capacity Charge (CCC) and Difference Payment Socialisation Charges (CSOCDIFFP) for units registered in the Northern Ireland jurisdiction were determined using the balancing market (daily) FX Rate rather than the Annual Capacity Exchange rate as per G.1.3.5 and G.1.3.6 of the TSC.</p> <p>This affected settlement calculations from 1 January 2020 to 28 April 2020.</p> <p>This issue was identified by SEMO as a defect (defect 147243) and was resolved in Release E on 28 April 2020.</p> | <p>For the period affected there was an error of €3.4m in the calculation of CCP, CCC and CSOCDIFFP. This error has been corrected during the audit period through resettlement and no net error exists as at 31 December 2020.</p> | <p>Accepted. This issue was identified by SEMO as part of our controls / reviews. It was fixed and fully resolved/resettled during the audit period as noted.</p> |
| <b>4.2 Incorrect determination of No Load Cost (CNL)</b>  |   |   |
| <p>We identified differences in our determination of CNL for four testing dates selected due to SEMO systems incorrectly applying CNL in settlement periods where the final physical notification quantity was non-zero.</p> <p>This issue was previously unknown and is under investigation by SEMO and their system vendor.</p>   | <p>Non-compliance with TSC Part B F.11.2.</p> <p>Based on initial analysis we estimate the impact over the audit period of circa €300k.</p>   | <p>Accepted. Issue (KIR #208126) under analysis with the vendor and will be prioritised for future market systems release.</p>                                    |

## 5 Other Matters Arising

| Issue   | Effect  | SEMO Response  |
|---|---|--|
| <b>Accession and Registration</b>   |   |  |
| <b>5.1 Party and Unit Registration – Publications</b>   |   |  |
| <p>A defect exists in the Daily Registered Units/Parties reports published on the SEMO Website causing the Registration Date field to report the last modification date instead of the Effective Date.</p> <p>We do note that an alternative “List of Registered Units” is available on the SEMO Website which is manually updated. This manually updated “List of Registered Units” contains the correct information of the Effective Date for the Units sampled and analysed.</p> | <p>There is incorrect information published on the website which may cause confusion.</p>   | <p>Accepted. SEMO can confirm that this issue is currently under investigation with the vendor. As noted, a manual report which contains the relevant data is published on the SEMO website.</p>   |
| <b>5.2 Party Registration – Executed Accession Deed not submitted to Applicant</b>  |   |  |
| <p>For 3 of the 3 parties sampled on our testing SEMO did not submit the executed Accession Deed to the Applicant. SEMO provided the following explanation "Due to the implementation of Covid restrictions the MO was unable to attend the office and had to review the process for execution with Legal department and management. A new process has been put in place, however there is a backlog of documentation that requires execution."</p>                                 | <p>This represents non-compliance with AP1 / 3.1 / 7, which requires that the "Market Operator executes and dates the Accession Deed and sends a copy to the Applicant. Applicant becomes a Party to the Code on the date specified in the Accession Deed.</p>  | <p>Accepted. SEMO are working through the backlog of documentation.</p>  |
| <b>5.3 Unit Registration – Deviations from timelines and meeting Code Requirements</b>  |   |  |
| <p>The following exceptions were noted during our testing:</p> <ul style="list-style-type: none"> <li>For 1 of the 8 units sampled, SEMO sent all relevant Participant IDs and Unit IDs to the relevant System Operator, and / or Meter Data Provider 9 working days (WD) after the Stage 2 (Review and Validation) commencing.</li> <li>For 2 of the 8 units sampled SEMO communicated the Initial Required Credit Cover amount to the party after 34</li> </ul>                   | <p>These exceptions represent non-compliance with the Code:</p> <ul style="list-style-type: none"> <li>Non-compliance with AP 1, 2.1, which requires that Registration Pack and all relevant Participant IDs and Unit IDs be sent to the relevant System Operator, and / or Meter Data Provider (as appropriate) "Within 3 WD of Stage 2 commencing"</li> <li>Non-compliance with AP1, 2.3, which requires that Initial Required Credit Cover amount and Authorised Signatory Form be issued "Within 3 WD of Stage 2 commencing"</li> </ul> | <ul style="list-style-type: none"> <li>- Accepted. SEMO can confirm that there was no impact to the Participant or delay to registration caused by this exception.</li> <li>- Accepted. SEMO can confirm that these registrations were not delayed due to this exception.</li> </ul> |

| Issue  | Effect  | SEMO Response   |
|--|---|---|
| <p>and after 22 WDs of Stage 2 (Review and Validation) commencing.</p> <ul style="list-style-type: none"> <li>For 1 of the 8 units sampled SEMO could not evidence that the Initial Required Credit Cover amount details were provided to the Party or Applicant by email.</li> <li>For 1 of the 8 units sampled SEMO could not evidence that the Commencement Notice were provided to the SO and MDP by email.</li> </ul> | <ul style="list-style-type: none"> <li>Non-compliance with AP1 / 3.2.2 / 2.3, which requires that Initial Required Credit Cover amount and Authorised Signatory Form be sent via Email</li> <li>Non-compliance with AP1 / 3.2.4 / 4.5, which requires that a Commencement Notice to the Party and a copy to System Operators and External Data Provider(s) be sent via Email</li> </ul> | <p>- Accepted. SEMO can confirm that sufficient credit cover was in place and there was no delay to this registration.</p> <p>- Accepted. SEMO can confirm that there was no impact to the Participant or delay to registration caused by this exception.</p> |
| <h4>5.4 Unit Deregistration – Delay in submission of Deregistration Consent Order</h4>   |   |   |
| <p>For 1 out of 8 unit deregistrations sampled SEMO submitted the Deregistration Consent Order to the System Operators, Relevant Meter Operator, and Regulatory Authorities 26 working days after the Deregistration date.</p>   | <p>Non-compliance with AP 18 / 3.1 / 8, which requires to "send Deregistration Consent Order to Participant, System Operators, Relevant Meter Operator, and Regulatory Authorities, before Deregistration date"</p>   | <p>Accepted. SEMO can confirm that there was no impact to the Participant or delay to the deregistration.</p>   |
| <h4>Imbalance Settlement Price Calculation and Recalculation</h4>  |   |   |
| <h4>5.5 Uninstructed Imbalance Charge (CUNIMB) Mod 5_19</h4>   |   |   |
| <p>An amendment to the CUNIMB calculation to correct for negative price scenarios (Mod 5_19) was effective from the 05/07/2019 but was not present in the system until Release E on 28 April 2020</p>  | <p>For the period affected there was an error of €170k in the calculation of the CUNIMB. This error has been corrected during the audit period through resettlement and no net error exists as at 31 December 2020.</p>   | <p>Accepted. Issue fully resettled as noted.</p>  |



| Issue  | Effect   | SEMO Response  |
|--|--|--|
| <b>Settlements Production and Reruns</b>   |  |  |
| <b>5.6 Incorrect order of ranked set in Biased Accepted Bid Quantity (QABBIAS), Undelivered Accepted Bid Quantity (QABUNDEL) and Outside Tolerance Undelivered Accepted Bid Quantity (QABUNDELLOTOL)</b>   |  |  |
| <p>The (initial) Ranked Set of QAO and QAB were being presented to the QABBIAS, QABUNDEL and QABUNDELLOTOL calculations in a descending order incorrectly. The order should be ascending.</p> <p>This was identified by SEMO as a defect (6047) and corrected in Release E on 28 April 2020.</p>   | <p>Non-compliance with TSC Part B:</p> <ul style="list-style-type: none"> <li>• F.6.7.9 - F.6.7.11 (QABBIAS)</li> <li>• F.6.6.4 &amp; F.6.6.5 (QABUNDEL)</li> <li>• F.9.3.4 - F.9.3.7 (QABUNDELLOTOL)</li> </ul> <p>The following payments/charges were impacted:</p> <ul style="list-style-type: none"> <li>• CIMB (for pump/battery storage unit in pumping mode)</li> <li>• CDISCOUNT</li> <li>• CPREMIUM</li> <li>• CCURL</li> <li>• Fixed Cost Charge (CFC)</li> <li>• Bid Price Only Accepted Bid Payment/Charge (CABBPO)</li> <li>• CUNIMB</li> </ul> <p>For the period affected there was an error of the order of €100k. This error has been corrected during the audit period through resettlement and no net error exists as at 31 December 2020.</p> | <p>Accepted. Issue fully resettled as noted.</p>   |
| <b>5.7 Dispatch Quantity set equal to Metered Quantity for PSUs in pumping mode</b>  |  |  |
| <p>We identified differences in our calculations of Undelivered Accepted Bid and Offer Quantities (QABUNDEL and QAOUNDEL) and Outside Tolerance Undelivered Quantity (QUNDELLOTOL) across four selected testing dates due to an issue affecting Pump Storage Units whilst in pumping mode. After investigation, it was found that SEMO systems incorrectly report Dispatch Quantity (QD) as equal to the Metered Quantity (QM) whilst in pumping mode.</p> <p>This is a previously unknown issue and is under investigation by SEMO and their system vendor.</p> | <p>The Quantities impacted are inputs into the following payments/charges:</p> <ul style="list-style-type: none"> <li>• CIMB</li> <li>• CDISCOUNT</li> <li>• CPREMIUM</li> <li>• CFC</li> <li>• CABBPO</li> <li>• CUNIMB</li> </ul> <p>The estimated impact over the audit period is €120k.</p>  | <p>Accepted. Issue (KIR #210,568) raised with the Vendor for prioritisation in a future release.</p> |

| Issue   | Effect   | SEMO Response  |
|---|--|--|
| <b>5.8 SEMO systems unable to correctly profile Dispatch Quantity (QD) when a unit is instructed below its Minimum Stable Generation</b>  |  |  |
| <p>We identified differences in the calculation of QD for one unit on one testing date selected. The cause was identified to be due to the unit being instructed to values below its minimal stable generation. This is a scenario SEMO systems are currently unable to profile.</p> <p>This was confirmed to be an issue previously identified by SEMO. SEMO are in discussion with the system vendor regarding resolution of this issue.</p>                          | <p>The issue affects the calculation of QBOA as QD is an input.</p> <p>Estimated quantity impact of 14MW. Due to the rarity of this scenario we estimate the impact over the audit period to be less than €10k.</p>  | <p>Accepted. Issue (#200756) under analysis with the vendor and will be prioritised for future market systems release.</p> |
| <b>5.9 Incorrect profiling of ROI wind units</b>  |  |  |
| <p>We identified differences in the calculation of QD, (Curtailment Accepted Bid Offer Quantity (QABCURL) and QBOA for 15 ROI wind units on one testing date selected. Upon investigation it was found that the QD appeared to be profiled based on a local constraint instruction, however no such instruction was present in the published daily dispatch instruction data.</p> <p>This is a previously unknown issue. SEMO have raised a ticket with the vendor.</p> | <p>The Quantities impacted are inputs into the following payments/charges:</p> <ul style="list-style-type: none"> <li>• CIMB</li> <li>• CDISCOUNT</li> <li>• CCURL</li> <li>• CUNIMB</li> </ul> <p>We estimate an impact over the audit period as approximately €150k.</p> | <p>Accepted. Issue (KIR #208363) raised with the vendor and will be prioritised for future market systems release.</p>     |

| Issue  | Effect  | SEMO Response   |
|--|---|---|
| <b>5.10 Incorrect determination Bid Offer Acceptance Quantity (QBOA) and Offer Price Only Accepted Bid Quantity (QAOPO) due to errors in the profiling of pseudo dispatch instructions</b>   |   |   |
| <p>We identified differences in the determination of QBOA within one testing date selected due to four issues relating to the profiling of pseudo dispatch instructions within SEMO systems:</p> <ol style="list-style-type: none"> <li>1. A PSYI pseudo dispatch instruction created at the wrong time leading to incorrect determination of PMIN and hence an incorrect QAO.</li> <li>2. SEMO systems did not consider a PSYN pseudo instruction, leading to incorrect determination of QAO and QAB.</li> <li>3. SEMO systems incorrectly profiled a PISP pseudo instruction, the profile associated with the PISP failed to ramp following completion of dwell time.</li> <li>4. SEMO systems incorrectly profiled a PMWO pseudo dispatch instruction. This was fixed in Release E and has been resettled.</li> </ol> <p>These issues were previously unknown and are under detailed investigation by SEMO's system vendor.</p> | <p>Estimated quantity impact of 215MW. Due to how QBOA inputs into the settlement calculations we estimate the impact over the audit period to be less than €10k.</p> | <p>Accepted. Issue raised with the Vendor (KIR #200702, #200785 and #208208) for prioritisation in future market release.</p> |
| <b>5.11 Error in slope within Bid Offer Acceptance Quantity (QBOA) profiling</b>   |   |   |
| <p>We identified differences in the calculation of QBOA for one unit on one testing date selected. The cause was identified to be an 'error in slope', which caused SEMO systems to be unable to profile QBOA for the entirety of the settlement day.</p> <p>This is a known issue that occurs sporadically in SEMO systems.</p>   | <p>Estimated quantity impact of 1,000MW. Due to the sporadic nature of this issue, we estimate the impact over the audit period to be less than €10k.</p>             | <p>Accepted. Issue (#191950, SF 1462042) raised with Vendor for prioritisation in future market release.</p>                  |

| Issue   | Effect  | SEMO Response   |
|---|---|---|
| <b>5.12 Incorrect determination of Non-Firm Accepted Bid Quantity (QABNF)</b>   |   |   |
| <p>We identified differences in the calculation of QABNF for one unit on one testing date selected. The cause was identified to be due to the SEMO system not taking into account the unit being part of a trading site.</p> <p>This is a previously unknown issue. SEMO have raised a ticket with the vendor.</p>  | <p>Non-compliance with TSC Part B F.6.5.</p> <p>The following payments/charges are impacted:</p> <ul style="list-style-type: none"> <li>• CDISCOUNT</li> <li>• CFC</li> </ul> <p>We estimate the impact over the audit period to be less than €10k.</p>   | <p>Accepted. Issue #209,147 raised with Vendor for prioritisation in future market release.</p>                 |
| <b>5.13 Incorrect determination of Bid Offer Acceptance Price (PBOA)</b>  |   |   |
| <p>We identified differences in the determination of PBOA for four testing dates selected due to three issues within SEMO systems:</p> <ol style="list-style-type: none"> <li>1. Incorrect commercial offer data type selected</li> <li>2. PBOA set to a non-zero value in cases where no QAO or QAB are calculated</li> <li>3. SEMO systems applied commercial offer data for the wrong date</li> </ol> <p>These issues were previously unknown and are under investigation by SEMO and their system vendor.</p>     | <p>Non-compliance with TSC Part B F.3.2, F.3.3 and F.6.3.</p> <p>The following payments/charges are impacted:</p> <ul style="list-style-type: none"> <li>• CDISCOUNT</li> <li>• CPREMIUM</li> <li>• CAOPO</li> <li>• CABBPO</li> <li>• CUNIMB</li> <li>• CFC</li> </ul> <p>We estimate the impact over the audit period as approximately €150k.</p> | <p>Accepted. Issue (KIR 210214 - 210217) raised with the vendor for prioitisation in future market release.</p> |
| <b>5.14 Currency inconsistency in the Settlement Reports and Make Whole Payment Reports</b>   |   |   |
| <p>We identified differences in our calculations of COCMWP, CREVMWP and Fixed Cost Charge (CFC) due to currency reporting issues in the Make Whole Payment and Settlement Reports.</p> <p>This issue is captured in the following defects:</p> <ul style="list-style-type: none"> <li>• 159462 - within the SR file, COCMWP are stated in GBP for NI units whereas CNL is stated in EUR.</li> <li>• 1371983 - the determinants COCMWP, CREVMWP and CNL are flagged as GBP but the values are stated in EUR</li> </ul> | <p>Non-compliance with TSC Part B G.1.3.</p> <p>This has been confirmed as a reporting issue only. The actual calculation and settlement of the affected costs are correct however the underlying supporting data published is incorrect.</p>   | <p>Accepted. This was resolved with the deployment of Release F on 04-Nov-2020.</p>                             |

| Issue   | Effect   | SEMO Response  |
|---|--|--|
| <b>5.15 Incorrect determination of Recoverable Start Up Cost (CSUR)</b>   |  |  |
| <p>We identified a difference in our calculation of CSUR for one unit on one testing date selected due to SEMO systems incorrectly determining a zero CSUR in one settlement period.</p> <p>The was identified as a defect (206073), due to be fixed in Release G, June 2021.</p>                   | <p>Non-compliance with TSC Part B F.11.2.4.</p> <p>The financial impact of the defect on the affected testing date, 04 February 2020, was found to be €12k. SEMO have confirmed this to be a rare issue, therefore we estimate an impact over the audit period to be of the order of €100k.</p>  | <p>Accepted. Issue (KIR 206073) raised with Vendor for prioritisation in future release.</p> |
| <b>5.16 Incorrect Combined Loss Adjustment Factor (FCLAF)</b>   |  |  |
| <p>We identified differences for a trading site supplier unit and a capacity aggregation unit, each on one testing date selected, due to the SEMO calculation being performed incorrectly.</p> <p>After investigation the cause was found to be a defect fixed in Release F on 4 November 2020.</p> | <p>The following payments/charges are impacted:</p> <ul style="list-style-type: none"> <li>• Day-ahead Difference Charge (CDIFFCDA)</li> <li>• Within-day Difference Charge (CDIFFCWD)</li> <li>• Non-performance Difference Charge (CDIFFCNP)</li> <li>• Total Difference Charge (CDIFFCTOT)</li> <li>• CCC</li> <li>• CSOCDIFFP</li> </ul> <p>We estimate the impact over the audit period to be less than €10k.</p> | <p>Accepted. Fixed in release F as confirmed by Vendor with resettlement ongoing.</p>        |



| Issue  | Effect  | SEMO Response  |
|--|---|--|
| <b>Queries and Disputes</b>  |   |  |
| <b>5.17 Settlement Queries</b>   |   |  |
| <p>The following deviations from the code were identified during our testing:</p> <ul style="list-style-type: none"> <li>For 2 of the 12 queries sampled SEMO did not submit the Settlement Query to the External Data Provider within the timescales required by the code. In the two cases noted the queries were submitted 17 and 20 days after the query was received</li> <li>It was noted that the SEMO did not communicate the timeline extension of 10 WD, which was agreed with the Raising Party for the query resolution purposes, to the External Data Provider.</li> <li>The MO does not communicate to the raising party the Method used to estimate Materiality.</li> </ul> | <p>These deviations represent the following non-compliance with the Code:</p> <ul style="list-style-type: none"> <li>This represents non-compliance with AP 13 / 3 / 14, which requires that the settlement query be sent to the external data provided "within 1 WD of receiving the Settlement Query".</li> <li>Non-compliance with AP 13 / 21, which requires the Affected Party / External Data Provider is notified of any changes to timeline</li> <li>Non-compliance with AP 13 / 3 / 22 which requires the MO to inform the Raising Party and the Affected Participant(s) of the Market Operator's method used to estimate materiality</li> </ul> | <p>Accepted. Under internal review with the relevant teams to consider process changes and/or a T&amp;SC modifications.</p>  |
| <b>Communication Channels, Systems and Operations</b>  |   |  |
| <b>5.18 Communication Channels - Communication Channels Qualification Testing (CCQT)</b>   |   |  |
| <p>In our review of the CCQT process, we have identified that for 3 of 5 sampled parties, SEMO's notification of the test required were not sent within the required 3WD timeframe from the receipt of the CCQT request.</p>   | <p>Non-compliance with AP 3, which required 3WD timeframe for the notification of the test required</p>   | <p>At the time of the audit, CCQT requests logged in the service management system did not have an associated SLA. As a result, some of these requests were not completed within 3 days. The application support CCQT process documents have subsequently been updated to include a 3 day response time frame.</p> |

| Issue   | Effect   | SEMO Response  |
|---|--|--|
| <b>5.19 Communication Channels - Digital Certificate Cancellation</b>   |  |  |
| <p>In our review of digital certificate cancellation, we identified the following:</p> <p>For 2 out of 15 sampled digital certificate cancellation, SEMO failed to notify the parties of the certificate cancellation within the 2WD timeframe.</p> <p>For 1 out of 15 sampled digital certificate cancellation, there is no supporting evidence of the certificate cancellation. Therefore, it was not determined when the cancellation was actioned and the Participant was notified.</p> | <p>Non-compliance with AP 3, which required 2WD timeframe for the notification of certificate cancellation</p>   | <p>Since the audit, the EirGrid Service Desk process for digital cert creation/re-issue/revocation has been amended to reflect the following:</p> <ul style="list-style-type: none"> <li>· requests for Production certificate action (creation/re-issue/revocation) are checked to ensure Manager (or nominated delegate) approval is attached to the request before action is taken;</li> <li>· the template in EirGrid's service management system, used for certificate related requests has been updated to match the obligations; and</li> <li>· the existing Service Desk process document has been updated.</li> </ul> |
| <b>5.20 Data Storage and IT Security - User Access Management</b>   |  |  |
| <p>In our review of users having privileged access to Dynamics ISEM, we identified two (2) generic accounts which no longer require system administrator access at the time of review. However, we further identified that these accounts have not been directly accessed for the period of review.</p>   | <p>Non-compliance with AP 5 which required support staff to have restricted access to specific areas of the system according to their level of authority and access requirements</p> | <p>One of the identified service accounts was setup in production and pre-production during the ISEM project in 2018. The account has been disabled in the production environment, however it is required in pre-production for testing.</p> <p>The other identified service account is required in production for running batch jobs and work-flows, and should not be removed. The service account will be renamed to reflect the account purpose. The IT Application Support team, are the only SEMO staff who can access this service account for the running of batch jobs and work-flows.</p>                            |
| <b>5.21 Emergency Communications</b>  |  |  |
| <p>Through inspection of the Market Message Publications and supporting evidence of the incident reporting, we noted that the decision to declare the incident a GCF was made on 25/04/2020 at 11:52 and the Participants were not notified of the GCF until two days after the incident occurred on 27/04/2020 at 11:05.</p>   | <p>Non-compliance with AP 7, which required the Market Operator to notify the impacted parties of the General Communication Failure immediately after determination of GCF</p>       | <p>Accepted. SEMO promptly communicated to Market Participants via market message that the MPI was unavailable but did not officially declare a GCF via market message until the 27th. The main priority was system restoration on the 25th.</p>   |

| Issue   | Effect  | SEMO Response   |
|---|---|---|
| <b>5.22 Data Storage and IT Security - Security of Data against Loss, Modification or Misuse</b>  |   |   |
| <p>AP5 requires SEMO to "...use reasonable and appropriate measures to ensure that its Isolated Market System is protected from all forms of cyber security threats, including but not restricted to unauthorised access, malicious code, Denial of Service Attack and data leakage".</p> <p>There is a centralised Security Operations team responsible for the security controls/program across the organisation and a range of IT Security measures are in place. However there is no documented risk assessment detailing how the threats specific to the Isolated Market System have been identified and assessed and what corresponding actions were put in place to address them</p> | <p>A risk assessment is a necessary pre-requisite to determine what activities are required to comply with the requirements of AP5.</p> | <p>The Central Market Systems are a key and integral part of the wider EirGrid group IT systems and platforms, and as such benefits from wider security risk assessment, comprehensive protective measures and operational controls.</p> <p>Independent security testing and associated risk assessments for externally facing Market System components were performed by third party cyber security specialists. The risks highlighted within the respective security reports and subsequent re-tests have been tracked and managed. Our security controls are under proactive review and we believe that appropriate measures to protect the Market Systems are in place.</p> <p>SEMO will complete a risk assessment documenting the internal and external cyber threats to the Market Systems and measures in place to address them as part of the overall organisational cyber security framework.</p> |



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