

Market Operator Monthly Report February 2015

Table of Contents

| 1 | EXECUTIVE SUMMARY | 4 |
|----|--|----|
| 2 | MONTHLY STATISTICS | 5 |
| | CODE BREACHES | 5 |
| | JOINING AND TERMINATING PARTIES AND UNITS | |
| | SUSPENSION OF PARTICIPANTS | 6 |
| 3 | FINANCIAL STATISTICS | 7 |
| | Total Charges for Each Currency | 7 |
| | TOTAL PAYMENTS FOR EACH CURRENCY | |
| | TOTAL BALANCING COSTS | |
| | TOTAL CURRENCY COSTS | |
| | CUMULATIVE IMPERFECTIONS COSTS VS BUDGET | |
| | FINANCIAL CHANGES BETWEEN INITIAL SETTLEMENT AND SUBSEQUENT RERUNS | |
| | 3.1.2 Capacity Market | |
| 4 | HELPDESK CALL STATISTICS | |
| | | |
| 5. | DISPUTES AND QUERIES | 22 |
| | 5.1.2 Data Queries | |
| | 5.1.3 Settlement Queries | |
| | UNRESOLVED QUERIES | 23 |
| 6. | CENTRAL SYSTEMS | 24 |
| | PROPORTION OF DEFAULT DATA USED | 24 |
| | PROPORTION OF ESTIMATED METER DATA USED IN INITIAL SETTLEMENT AND RESETTLEMENT | |
| | LIST OF SYSTEM ERRORS AND RE-RUNS | |
| | 6.1.1 Re-Pricing and Resettlement Runs | |
| | 6.1.2 System Errors | |
| | 6.2.1 MSP Postings February 2015 | |
| | 6.2.2 MSP Algorithms | 28 |
| | 6.2.3 Settlement Postings February 2015 | 29 |
| | 6.5 MARKET SYSTEM RELEASES | 30 |
| | 6.5.1 Release SEM R2.6.0 (Proposed Deployment: April 2015) | |
| 7 | OCCASIONAL COMPONENTS | 31 |
| | 7.1 DISASTER RECOVERY/BUSINESS CONTINUITY TESTS | 31 |
| | 7.3 COMMUNICATIONS OR SYSTEMS FAILURES | |
| | 7.4 DENIAL OF SERVICE ATTACKS | |
| | | |
| 8 | APPENDIX A: DETAIL OF CODE BREACHES | 32 |
| | MARKET PARTICIPANT | 32 |
| | DATA PROVIDER | |
| | SEMO - PRICING AND SCHEDULING | |
| | SEMO - SETTLEMENTS | |
| | SEMO - CREDIT MANAGEMENT | |
| | SEMO - OTHER | |
| 9 | APPENDIX B: LIST OF QUERIES BY TYPE | 35 |
| | DATA QUERIES | 35 |
| | SETTLEMENT QUERIES | |
| 10 | D APPENDIX C: LIST OF ALL SYSTEM ERRORS AND FAILURES | 36 |
| | | |
| 1 | 1 APPENDIX D: DETAILS OF OPERATIONAL TIMINGS | 3/ |

| MARKET SCHEDULE AND PRICE RUNSSETTLEMENT RUNS | |
|---|----|
| 12 APPENDIX E: IMPERFECTIONS CHARGE | 39 |
| 13 APPENDIX F: DEFAULT COMMERCIAL OFFER DATA USED | 45 |
| 14 APPENDIX G: TOTAL CHARGES AND PAYMENTS DATA | 49 |
| 15 APPENDIX H: FULL BALANCING COSTS | 51 |
| Trading Market | 51 |
| CAPACITY MARKET | 51 |
| 16 APPENDIX I: MSP ALGORITHMS | 53 |

1 Executive Summary

This Single Electricity Market Operator's (SEMO) report covers the month of operation of February 2015 and is published in accordance with the Single Electricity Market (SEM) Committee decision and Clause 2.144 of the Trading and Settlement Code. Trading and Settlement Code.

During the month of February 2015, Settlements had five late publication as per the Trading and Settlement code for Indicative Settlement.

142 general queries were received in February 2015. During the same period 152 general queries were resolved.

There were nine defaults by Participants during February 2015. The largest of these was a Capacity Adhoc €270.72 invoice which was remedied on the same day.

Formal queries continue to be answered well within the timelines stipulated in the Trading and Settlement (Code).

2 Monthly Statistics

Code Breaches

Breaches of the Trading & Settlement Code were noted in the following areas.

| Code Breaches | | | | | | |
|---------------------|------------------------|----|---|--|--|--|
| | Area Major Minor | | | | | |
| Data Providers | | - | - | | | |
| Market Participants | Pricing & Scheduling | - | - | | | |
| | Settlement | - | - | | | |
| | 9 | - | | | | |
| | 2 | - | | | | |
| SEMO | Pricing & Scheduling | - | 3 | | | |
| | Settlement | 1 | 4 | | | |
| | Funds Transfer | - | - | | | |
| | Credit Risk Management | - | - | | | |
| | Other | | | | | |
| Total | | 12 | 7 | | | |

Table 1 - Code Breaches

Further details of each of the code breaches noted above are set out in Appendix A

Key:

- Major Breach late publishing of invoices, default notices issued for non-payment or similar.
- Minor Breach deadlines not met, but any financial implication to Participants. This includes late posting of pricing and settlement runs.

Joining and Terminating Parties and Units

No Party joined the Market in February 2015.

There were no terminating parties in February 2015.

One new unit became effective in the Market in February 2015.

- Interconnector Unit Vayu - PPMG - (PT_400141/Interconnector)

There was one unit de-registered from the Market in February 2015.

- First Electric Ireland - APTG - (PT_400058/GU_400680)

One Supplier unit became effective in the Market in February 2015.

Panda Power Ltd (SU_400185/PT_400161)

Suspension of Participants

There have been no Suspension Orders issued by the Market Operator at this time.

3 Financial Statistics

Total Charges for Each Currency

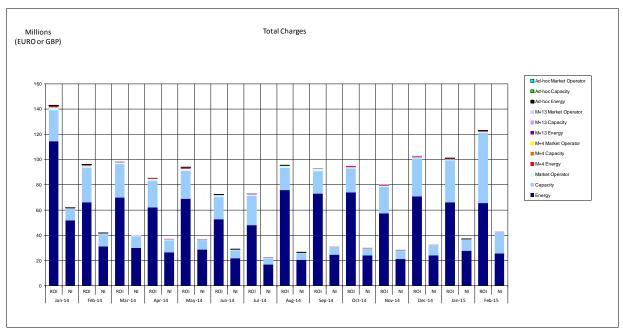


Figure 1 - Total Charges for Each Currency

| Market | February 2015 | |
|------------------------|---------------|-------------|
| | ROI | NI |
| Energy | €65,650,453 | £25,773,048 |
| Capacity | €55,349,682 | £16,395,217 |
| Market Operator | €856,457 | £213,119 |
| M+4 Energy | €281,934 | £112,874 |
| M+4 Capacity | €56,930 | £37,026 |
| M+4 Market Operator | €1,559 | £784 |
| M+13 Energy | €451,007 | £25,242 |
| M+13 Capacity | €29,818 | £5,150 |
| M+13 Market Operator | €840 | £140 |
| Ad-hoc Energy | €68,858 | £0 |
| Ad-hoc Capacity | €0 | £0 |
| Ad-hoc Market Operator | €0 | £0 |
| Total | €122,747,537 | £42,562,600 |

Table 2 - Total Charges for Each Currency

Notes relating to Table 2 and 3:

- Month of inclusion based on Invoice Date.
- Amounts are after application of Settlement Reallocations.
- Previous month's data is available in <u>Appendix G</u>.

Total Payments for Each Currency

Figure 2 - Total Payments for Each Currency

| Market | February 2015 | | |
|------------------------|---------------|-------------|--|
| | ROI | NI | |
| Energy | €73,470,093 | £19,828,438 | |
| Capacity | €55,924,537 | £15,954,829 | |
| M+4 Energy | €296,451 | £108,023 | |
| M+4 Capacity | €68,642 | £28,546 | |
| M+4 Market Operator | €1,587 | £367 | |
| M+13 Energy | €108,844 | £16,958 | |
| M+13 Capacity | €30,841 | £4,432 | |
| M+13 Market Operator | €843 | £141 | |
| Ad-hoc Energy | €0 | £0 | |
| Ad-hoc Capacity | €0 | £0 | |
| Ad-hoc Market Operator | €0 | £0 | |
| Total | €129,901,837 | £35,941,733 | |

Table 3 - Total Payments for Each Currency

Total Balancing Costs

Balancing Costs arise in the Energy and Capacity markets when the summed payments to the SEM from Participants in respect of their Supplier Units do not meet the summed payments to Participants from the SEM in respect of their Generator Units.

Although, it is intended the Energy Payments and Energy Charges should be balanced through the mechanism of the Error Supplier Unit in each jurisdiction, because Energy Payments are made against Market Schedule Quantities while the Error Supplier Unit volumes are calculated against Metered Generation, the different application of Loss Factors means that there is frequently an imbalance between the Energy Payments and Energy Charges.

With regard to the Energy Settlement, the Balancing Costs have been calculated as follows for the entire month:

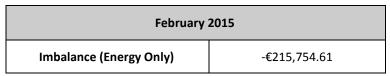


Table 4 - Balancing Costs for Energy Settlement

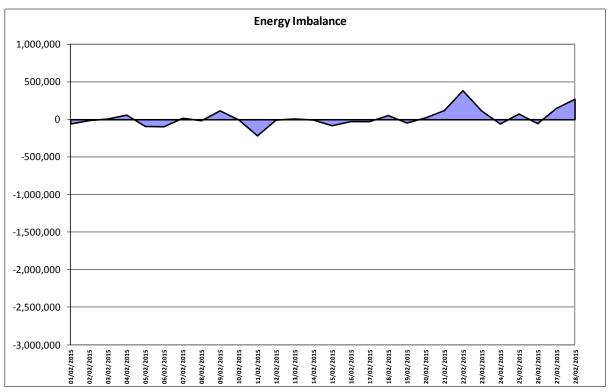


Figure 3 – Energy Imbalances

The full Balancing Cost of the SEM is determined by the summation of the daily payment amounts for Energy Imbalance, Constraint Payments, Uninstructed Imbalance Payments, and Imperfections Charges combined with the weekly Make Whole Payments and Testing Charges.

Historical values for testing charges have been provided in Appendix E.

The figures for the full Balancing Cost of the SEM since the last Market Operator report are shown below, as well as the VAT Balancing Costs.

In tables 5 and 6 below:

- Positive values indicate Payments were greater than Charges.
- Negative values indicate Charges were greater than Payments.

| Date Of Invoice | Week No | SEM Balancing Costs | VAT Balancing Costs |
|-----------------|---------|---------------------|---------------------|
| 06/02/2015 | 4 | €371,162.79 | -€86,251.15 |
| 13/02/2015 | 5 | -€198,874.86 | €21,560.90 |
| 20/02/2015 | 6 | -€341,073.88 | €60,600.73 |
| 27/02/2015 | 7 | €9,930.09 | -€86,398.49 |

Table 5 - Balancing Costs for Trading Payments and Charges

SEM Balancing Costs are provided based on daily exchange rates, VAT Balancing Costs are based on the Invoicing day exchange rate. VAT Balancing costs exclude Currency Cost related VAT.

It is intended that the algorithms set out in the Trading and Settlement Code will lead to a balanced Capacity Market. However, rounding precisions within the systems may result in an imbalance being introduced into the equations. This imbalance may lead to funding requirements to ensure that all payments out are made as per the terms of the Code.

With regard to the Capacity Settlement, the Balancing Costs have been as follows:

| February 2015 | | | |
|-------------------|-----------------|--|--|
| Capacity Charges | -€56,227,796.84 | | |
| Capacity Payments | €56,227,432.66 | | |
| Balancing Costs | -€364.18 | | |
| VAT | €0.02 | | |

Table 6 - Balancing Costs for Capacity Settlement

Historical figures, the current financial year full Balancing Costs for both Trading and Capacity are provided in <u>Appendix H</u>. VAT Balancing costs exclude Currency Cost related VAT.

Total Currency Costs

Currency Costs in the SEM are calculated with respect to the difference in Exchange Rates due to two components:

1) Invoice Currency Costs: - in respect of the difference between the Trading Day Exchange Rate (and Annual Capacity Exchange Rate in respect of Capacity Settlement)

and the Exchange Rate on the Date of Invoice (being the date of issue of the Invoice) for Trading Payments and Charges.

2) Payment Period Currency Costs: - in respect of the difference between the Exchange Rates between the Date of Invoice and the Date of Payment.

Although the Code uses the term Currency Cost, the currency differences may end up as a benefit or a cost to the Participant depending on how the Exchange Rate fluctuates between the Billing Period, Invoice Date and Payment Date. In the table below, where this value is positive this means there was an overall benefit to Participants, negative values mean there was an overall cost to Participants resulting from trading in two currencies. Figures are shown in Sterling (£).

| Last Date Of Billing Period | Date Of Invoice | Week No | Currency Costs For Energy Settlement (Invoice and Payment) | Currency Cost Adjustment for Inter- jurisdictional SRAs | Total Currency Cost |
|--------------------------------|-----------------|---------|--|---|------------------------|
| 06/02/2015 | 31/01/2015 | 4 | £4,160.55 | -£4,890.94 | -£730.40 |
| 13/02/2015 | 07/02/2015 | 5 | £6,617.38 | £26,028.49 | £32,645.87 |
| 20/02/2015 | 14/02/2015 | 6 | £3,757.74 | £11,488.02 | £15,245.76 |
| 27/02/2015 | 21/02/2015 | 7 | £2,155.07 | £13,315.77 | £15,470.84 |

Table 7 - Total Currency Costs for Trading Payments and Charges

The Total Currency Cost figures detailed above show the Currency Cost for each Billing Period including Invoice Currency Costs, Payment Period Currency Costs, and Inter-jurisdictional SRA Currency Costs.

Over the period of this report Currency Costs for each week represented a benefit to Participants of up to £32,645.87 and a cost of £730.40. Whether Currency Costs are a cost or benefit to Participants is directly related to whether the currency is rising or falling between the billing period, invoice date and payment dates.

Settlement Reallocation Agreements between the two currency zones continue to present volatility in the Currency Costs that appear in the Energy market each week. The value of these adjustments is detailed separately above in each Billing Period.

The Currency Costs, for the current financial year, with respect to Initial Capacity Settlement are set out below. Figures are shown in Sterling (£).

| Date Of Invoice | Capacity Month | Currency Costs For Capacity Settlement |
|-----------------|----------------|---|
| 10/03/2015 | February 2015 | £30,646.09 |

Table 8 - Total Currency Costs for Capacity Payments and Charges

Cumulative Imperfections Costs Vs Budget

The value of Cumulative Imperfections Costs Vs Budget is calculated as the sum of Total Constraint Payments, Total Uninstructed Imbalance Payments, Total Testing Charges and

Total Make Whole Payments, as compared against the Total Imperfections Charges, being the weekly budget for these Imperfections Costs.

These values have been collected across the months since the start of the new financial year, 1st October 2014. The values expressed in Euros are as follows.

This table makes use of the values taken from the Initial Settlement Run of Trading payments and charges.

| Total Constraint | Total Uninstructed | Total Make Whole | |
|------------------|--------------------|------------------|---------------------|
| Payments | Imbalance | Payments | Total Imperfections |
| €85,137,988.18 | -€1,814,972.48 | €2,854,355.47 | -€80,491,983.51 |

Table 9 - Cumulative Imperfections Costs Vs Budget

Note: The Total Contraint Payment figure above has been updated to contain Interconnector Unit Gate variables.

This is demonstrated in the figure below.

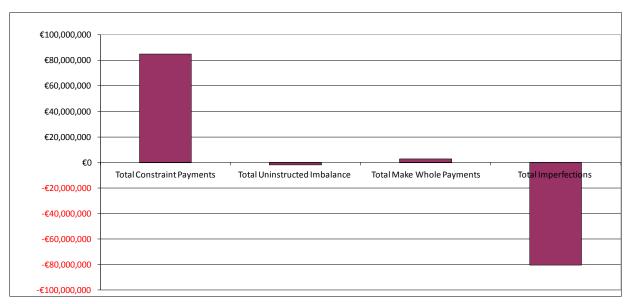


Figure 4 - Cumulative Imperfections Costs Vs Budget

The daily and weekly data that comprised these values is shown in Appendix E.

Financial Changes between Initial Settlement and Subsequent Reruns

The following graphs provide a breakdown of resettlement amounts for the M+4 resettlement period of October 2014 and M+13 resettlement period of January 2014 for Energy and Capacity.

3.1.1 Energy Market

Note: - For Figure 6, 8, 9, net values are shown.

Positive amounts indicate net additional payments by Participants (Charges).

 Negative amounts indicate net additional payment to be made <u>to</u> Participants (Payments).

The reverse is true for Figure 7 & 10

M+4 Resettlement

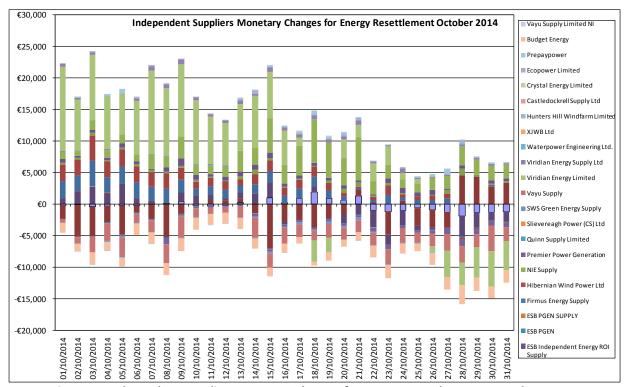


Figure 5 – Independent Suppliers Monetary Changes for Energy Resettlement – October 2014

The above variances relates purely to rounding for Participants between Initial and M+4 Resettlement.

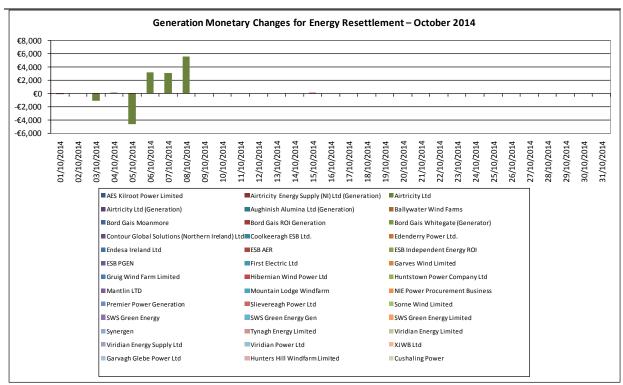


Figure 6 - Generation Monetary Changes for Energy Resettlement - October 2014

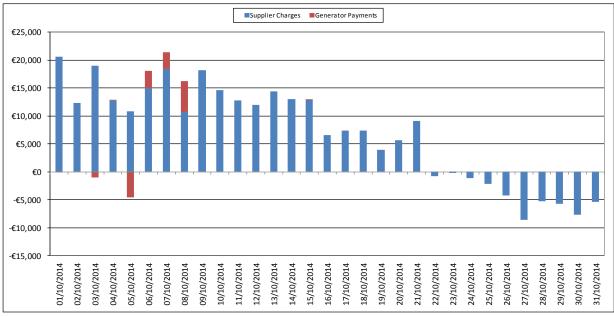


Figure 7 – Total Monetary Changes for Energy Resettlement – October 2014

M+13 Resettlement

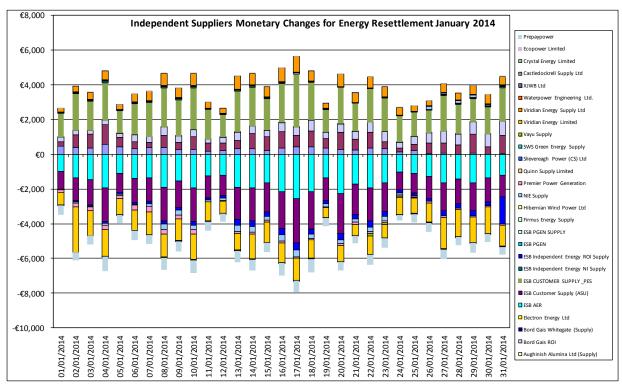


Figure 8 - Independant Suppliers Monetary Changes for Energy Resettlement - January 2014

The above variances relates purely to rounding for Participants between M+4 and M+13 Resettlement.

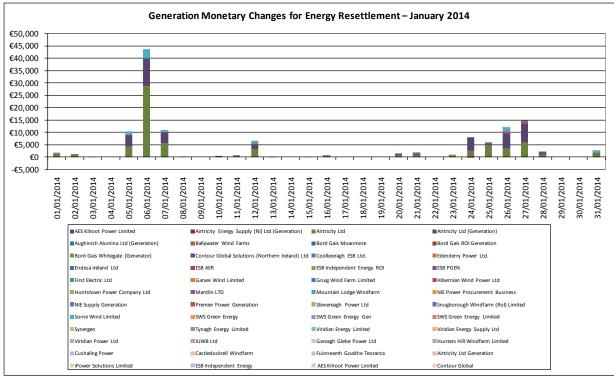


Figure 9 - Generation Monetary Changes for Energy Resettlement – January 2014

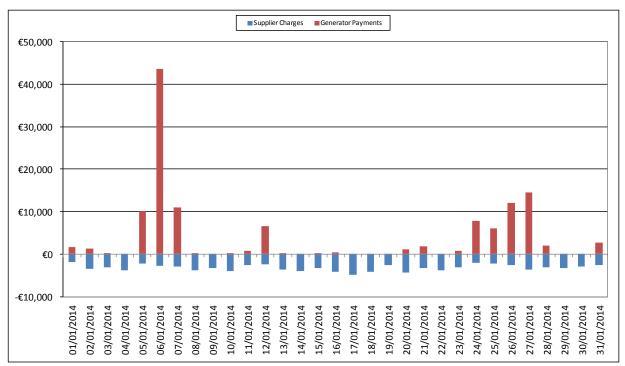


Figure 10 - Total Monetary Changes for Energy Resettlement - January 2014

3.1.2 Capacity Market

Note: - For Figure 12, 13 & 16 net values are shown.

- Positive amounts indicate net additional payments <u>by</u> Participants (Charges).
- Negative amounts indicate net additional payment to be made <u>to</u> Participants (Payments)

The reverse is true for Figure 14 & 22.

The changes in Capacity are graphed below showing the variance in monetary terms as opposed to percentage terms. As the Jurisdictional Error Supply Units can be significantly affected by resettlement, this is more reflective of the monetary redistribution in M+4 and M+13. Please also note that as of June 2011 the Jurisdictional Error Supply Unit (ROI) is now a Retail Supply unit. The Jurisdictional Error Supply Unit (NI) is unchanged.

M+4 Resettlement

Under resettlement, charges originally attributed to the Jurisdictional Error Supplier Units, have now been redistributed among Market Participants.

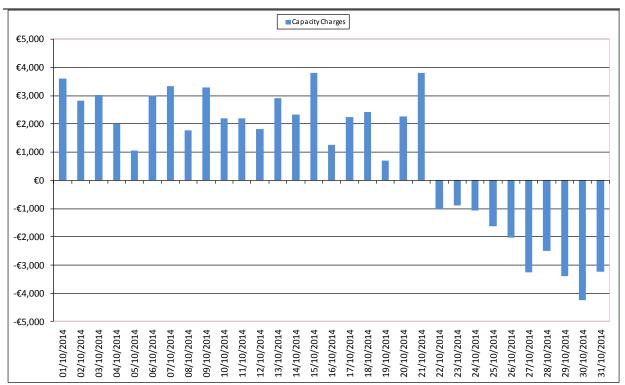


Figure 11 - Independent Suppliers Monetary Changes for Capacity Resettlement - October 2014

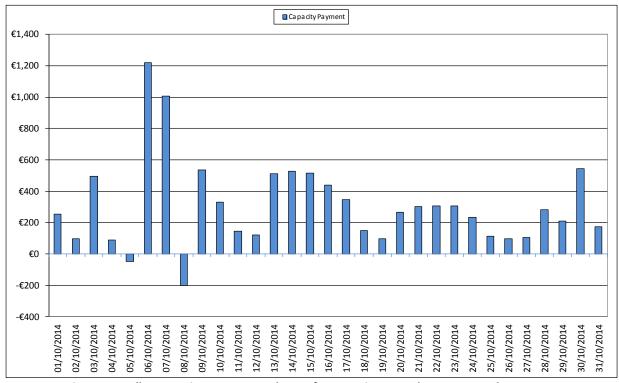


Figure 12 - All Generation Monetary Change for Capacity Resettlement - October 2014

The changes above are driven by updated meter data for Autonomous Price Taker Generators.

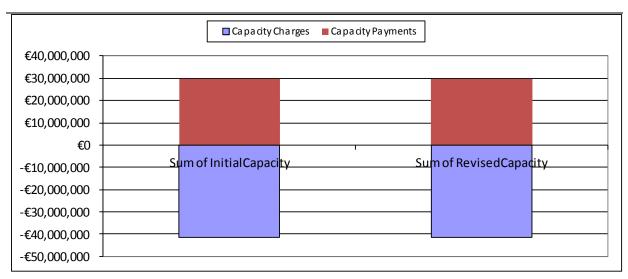


Figure 13 - Comparison of Distribution of Monetary Amounts between Capacity Initial and Resettlement
October 2014

The above graph demonstrates that due to all the individual changes to payment and charge amounts on a Supplier or Generator Unit basis, the overall Capacity Market resettlement Charge and Payment amounts have not changed due to resettlement.

M+13 Resettlement

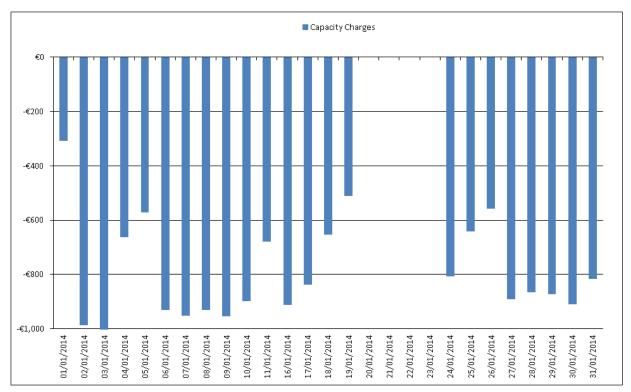


Figure 14 - Independent Suppliers Monetary Changes for Capacity Resettlement - January 2014

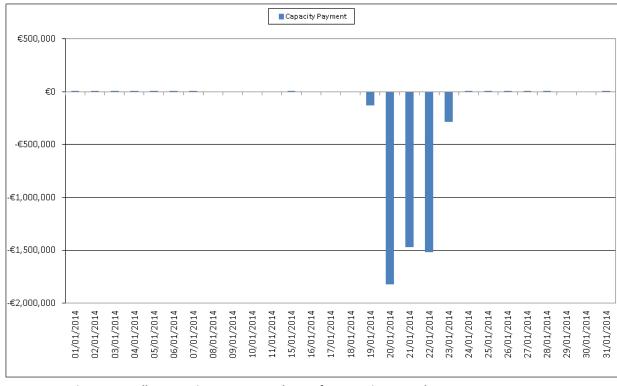


Figure 15 - All Generation Monetary Change for Capacity Resettlement - January 2014

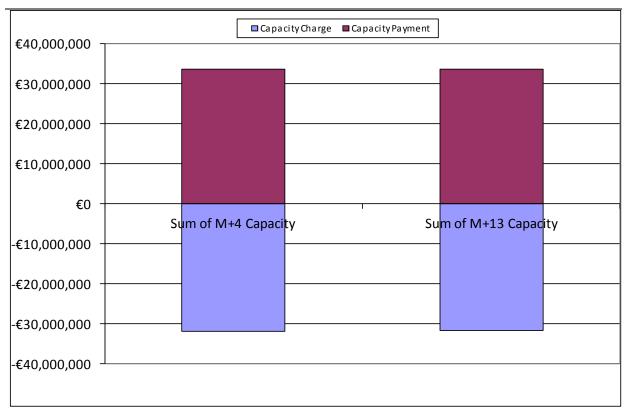


Figure 16 - Comparison of Distribution of Monetary Amounts between M+4 Capacity Resettlement and M+13

Capacity Resettlement – January 2014

The above graph demonstrates despite all the individual changes to payment and charge amounts on a Supplier or Generator Unit basis, the overall Capacity Market resettlement Charge and Payment amounts have not changed due to resettlement.

4 Helpdesk Call Statistics

The statistics presented in Table 10 - Helpdesk Call Statistics covers the month of February 2015.

Market Helpdesk Report: 01/02/15 to 28/02/15

| | Received | Resolved within the period | Not Resolved | Resolved in the period | Resolution Time (Working Days) | Resolved On Time |
|---------------|----------|----------------------------------|-----------------|------------------------------|--------------------------------------|---------------------|
| Normal | 141 | 129 | 12 | 150 | 2.20 | 136 |
| Important | 0 | 0 | 0 | 1 | 3.55 | 0 |
| Urgent | 1 | 1 | 0 | 1 | 0.75 | 1 |
| Settlement | 5 | 2 | 3 | 3 | 5.96 | 3 |
| Credit | 0 | 0 | 0 | 0 | 0.00 | 0 |
| Dispute | 0 | 0 | 0 | 0 | 0.00 | 0 |
| Data | 2 | 2 | 0 | 2 | 9.61 | 2 |
| Total/Average | 149 | 134 | 15 | 157 | 4.41 | 142 |

Table 10 - Helpdesk Statistics

Definitions:

- Resolved within the Period refers to queries raised and resolved within the calendar month of February 2015.
- Resolved in the Period refers to queries resolved within February 2015, and includes queries raised before this time.
- Resolution Time (Working Days) refers to average time to resolve, in working days, for this category of query. It is calculated based on all queries for the category, not just February 2015.
- Not Resolved refers to queries raised but not resolved within February 2015.
- *Urgent* are general queries which may have an impact on market operations. SEMO has an internal objective to resolve these within 3 working days; however, this is not mandated service level under the Trading & Settlement Code.
- Disputes are where a dispute has been raised over the outcome of a data or settlement query.

The average resolution time for General Queries has increased by 0.42 working days in February 2015 to 2.19 from 1.77 working days in January 2015. SEMO has a metric to resolve General Queries within 20 Working Days. These include queries received over the phone and e-mail. There were no queries logged in February 2015 that took over 20 working days to resolve.

Data and Settlement Queries generally continue to be responded to within the timelines required by the Code, i.e. one calendar month. No Formal Query timeline extensions were required during February 2015 with regard to formal Settlement Queries.

5. Disputes and Queries

5.1.1 Disputes

There were no Disputes raised during the month of February 2015 and there are no outstanding Disputes.

5.1.2 Data Queries

There were two formal Data Queries raised during the month of February 2015.

| Topic | Number Of Queries |
|-----------------------|-------------------|
| Actual Availabilites | 1 |
| Dispatch Instructions | 1 |

Table 12 – Upheld Data Queries by topic

- One query relating to Actual Availabilites was raised, this was deemed to be of low materiality and will be corrected in Initial Capacity.
- One query relating to Dispatch Instructions was raised, this was deemed to be of low materiality and will be corrected in M+4.

5.1.3 Settlement Queries

There were five Settlement Queries raised in February 2015. Of the five, one was not upheld and four were resolved.

| Topic | Number Of Queries |
|---------------------|-------------------|
| Payment Calculation | 1 |
| Availabilities | 2 |
| Meter | 1 |

Table 13 - Upheld Settlement Queries by topic

- One query relating to a Payment Calculation was raised, this was deemed to be of low Materiality and will be corrected in Adhoc re-settlement.
- One query relating to an Eligible Availability Payment Calculation was upheld, however it is not Material and will not be re-settled.
- One query relating to Actual Availabilities was raised, this was due to the second VPTG defect.
- One query relating to an Eligible Availability Payment Calculation was upheld, however it is not Material and will not be re-settled.
- One query relating to Metered Generation was raised, this was deemed to be of low Materiality and will be corrected in M+4.

Unresolved Queries

There are no unresolved Data Queries as at the 13th of March, 2015.

A full list of all the Data and Settlement queries raised is contained in Appendix B.

6. Central Systems

Proportion of Default Data Used

On review of the Commercial Offer Data used in the MSP runs, 74.26% of data used was submitted by Participants through the normal Bid-Offer process. 25.58% of the data used was based on Standing Commercial Offer Data. 0.16% of the data used was based on adjusted offer data. None of the data used was based on Default Commercial Offer Data (Default differs from Standing in that it is based on the initial Default data submitted during registration process and not on more recent Standing Data submitted by the Participant through the Market Participant Interface). Details by unit are provided in <u>Appendix F</u>.

Proportion of Estimated Meter Data used in Initial Settlement and Resettlement

This is not calculable presently.

List of System Errors and Re-runs

6.1.1 Re-Pricing and Resettlement Runs

There were no Re-Price runs carried out in February 2015.

There were two Resettlement runs carried out in February 2015.

6.1.2 System Errors

There were three defects found in February. One in the Market Interface (MI) and two in the Market Application (MA).

- 1. Defect 137973
- 2. Defect 138021
- 3. Defect 137670

These have all been raised as defects and we will aim to have them fixed for the SEM 2.6.0 Release.

Details are provided in 10 Appendix C: List of All System Errors and Failures.

6.2 Operational Timings

This section lists the operation timings of MSP software runs and Settlement runs.

There are five run types for MSP software,

- Ex-Ante 1 Indicative, run on Trading Day 1 calendar day,
- Ex-Ante 2 Indicative, run on Trading Day 1 calendar day,
- With In Day 1 Indicative, run on Trading Day,
- Ex-Post Indicative, run on Trading Day + 1 calendar day, and
- Ex-Post Initial, run on Trading Day + 4 calendar days.

The following tables and graphs provide details for the postings of the MSP for February 2015.

6.2.1 MSP Postings February 2015

| Process | On Time | < 1 hr late | > 1 hr late | Not done |
|---------------|---------|-------------|-------------|----------|
| Gate Close EA | 31-31 | 0-31 | 0-31 | 0 |
| Post EA1 | 31-31 | 0-31 | 0-31 | 0 |
| Post EA2 | 31-31 | 0-31 | 0-31 | 0 |
| Post WD1 | 31-31 | 0-31 | 0-31 | 0 |
| Post EP1 | 31-31 | 0-31 | 0-31 | 0 |
| Post EP2 | 31-31 | 0-31 | 0-31 | 0 |

Table 14 - Operational Timings

| Process | On Time | < 1 hr late | > 1 hr late | Not done |
|------------|---------|-------------|-------------|----------|
| Gate Close | 100% | 0% | 0% | 0% |
| Post EA1 | 100% | 0% | 0% | 0% |
| Post EA2 | 100% | 0% | 0% | 0% |
| Post WD1 | 100% | 0% | 0% | 0% |
| Post EP1 | 100% | 0% | 0% | 0% |
| Post EP2 | 100% | 0% | 0% | 0% |

Table 15 - Operational Timings (% on time)

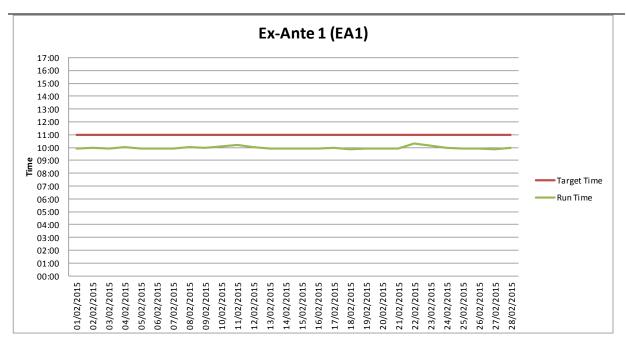


Figure 17 - Ex-Ante 1

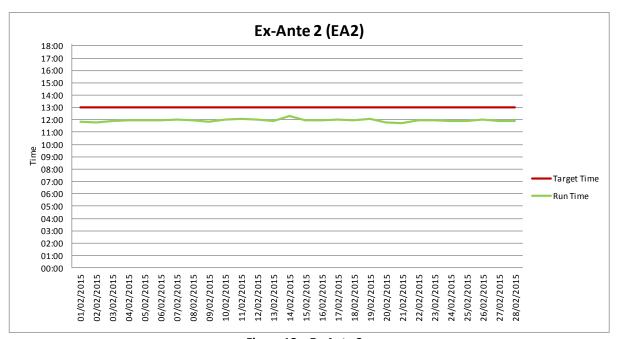


Figure 18 – Ex-Ante 2

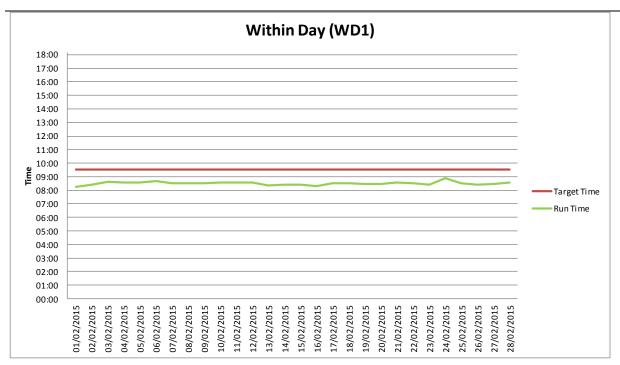


Figure 19 - Within Day 1

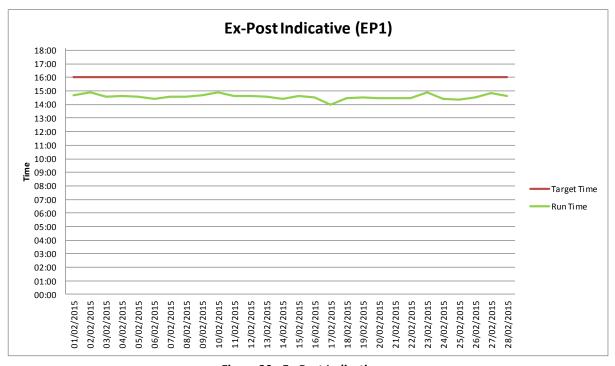


Figure 20 - Ex-Post Indicative

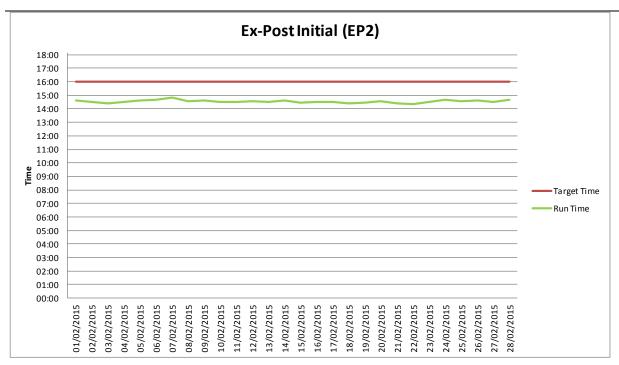


Figure 21 - Ex-Post Initial

Details of the operational timings of the Market System and Price (MSP) runs and Gate Closure are provided in <u>Appendix D</u>.

6.2.2 MSP Algorithms

The Market Operator has two different certified solvers used to determine Unit Commitment. These solvers use the Lagrangian Relaxation (LR) and Mixed Integer Programming (MIP) methodologies.

The primary solver used in the SEM is Lagrangian Relaxation (LR). Under certain schedule outcomes where a significant pricing event is observed, the MSP software is re-run using the Mixed Integer Programming (MIP) solver. The outcomes of the two solvers are compared. Where solution determined using the MIP solver provides a better overall solution, this solution may be selected for publishing. An updated policy document on the use of MIP has been published and is available on the SEMO website <a href="https://example.com/here-running-mail-running-running-mail-running-

In February 2015, there were ten instances of publishing with the MIP solver.

A detail of historical runs and dates where the MIP algorithm has been used for published results is provided in <u>Appendix I</u>.

6.2.3 Settlement Postings February 2015

The publication timings for Settlement runs are provided below.

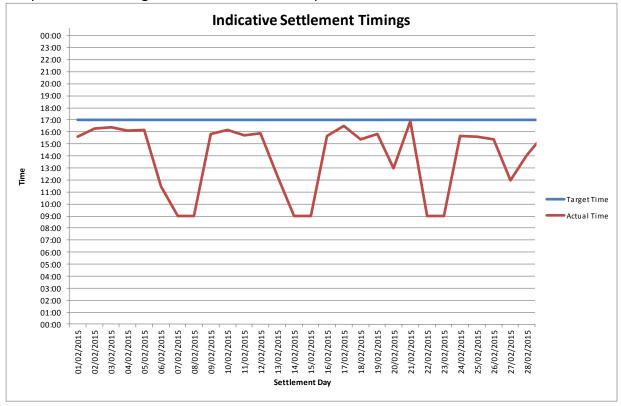


Figure 22 - Indicative Settlement Postings

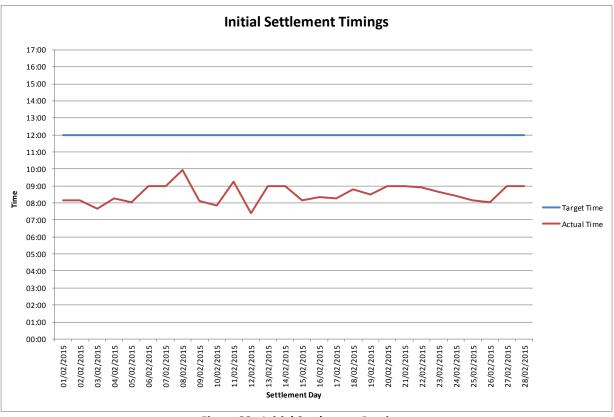


Figure 23 - Initial Settlement Postings

Further details of any delays noted above are provided in Appendix A

6.5 Market System Releases

6.5.1 Release SEM R2.6.0 (Proposed Deployment: April 2015)

The release cut-off date for the SEM R2.6.0 release was Friday 5th of September 2014.

As at the Cut-Off Date there were no:

- Approved Modification Proposals or
- New Change Requests submitted to the SDS

As there are no functional changes being proposed, a Change Control Forum (CCF) meeting will not be required. Three technical changes have been proposed by SEMO IT and these are currently being assessed by our vendors. Once assessments are complete SEMO will issue a scope proposal to the Regulatory Authorities and if approved, this will be published to the industry.

We are due our first drop of the software on 31st of March. Once deployed to non-production Systen Integration Testing (SIT) will commence. As there are no functional changes a full suite of regression tests will be performed to verify the applications are fit for purpose.

7 Occasional Components

7.1 Disaster Recovery/Business Continuity Tests

There was no Business Continuity Tests performed during February 2015.

7.3 Communications or Systems Failures

There was 2 Market Interface System issues during February 2015;

On the 2nd of February 2015, Market Operations reported that a participant had logged an issue stating that their Type 3 submissions to the SEM webservice had failed, but upon retrying, the submissions worked successfully. An issue was found by Market Systems IS, and was corrected live (without any outage required). All submissions were monitored after this by Market System IS and there was no re-occurrence of the observed issue.

On the 3rd of February 2015, the TSO reported that they had an issue submitting meter data to the AMP web service. A call was placed with the 3rd party vendor, and upon investigation, it was discovered that the login account used by the TSO (SONIWS) was locked out due to unsuccessful login attempts. The 3rd party vendor unlocked the account, the TSO tested again, and submission worked successfully.

7.4 Denial of Service Attacks

There was no Denial of Service Attacks during February 2015.

7.5 Submission of Parameters to RAs for Approval

No parameters were submitted to the Regulatory Authorities during February 2015.

8 Appendix A: Detail of Code Breaches

Market Participant

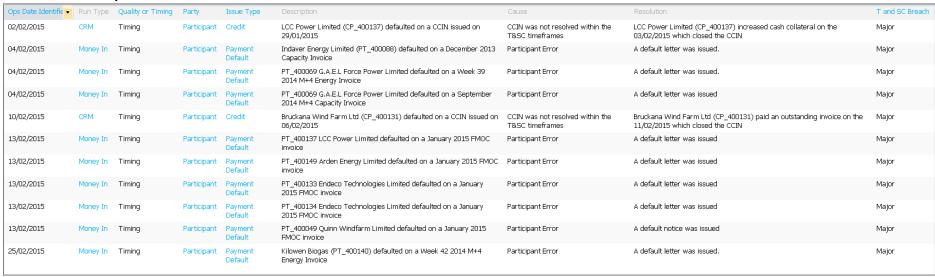


Table 16 - Code Breaches – Market Participants

Data Provider

There were no issues to report in February 2015

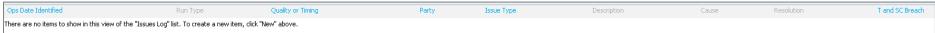


Table 17 - Code Breaches - Data Providers

SEMO - Pricing and Scheduling

There were no issues to report in February 2015

| Ops Date Identified | Run Type | Quality or Timing | Party | Issue Type | Description | Cause | Resolution | T and SC Breach |
|---------------------|----------|-------------------|-------|-------------|---|---|---|-----------------|
| 09/02/2015 | EP1 | Quality | SEMO | Operational | The Eirgrid data feed SO_EP_LOSS_OF_LOAD_PROBABILITY for Trade Date 09/02/2015 failed to submit correctly. | The relevant gate EXT_EP_LOLP had been closed in error by SEMO on the previous Operational Date 08/02/2015. | Eirgrid IT submitted the data feed manually. SEMO reopened the relevant gate and uploaded the file manually. The data feed was successfully received into the Market Systems. | Minor |
| 16/02/2015 | EA1 | Quality | SEMO | Operational | The Eirgrid data feed SO_EP_LOSS_OF_LOAD_PROBABILITY for Trade Date 16/02/2015 failed to submit correctly at 16:00pm on the 15/02/2015. | The relevant gate EXT_EP_LOLP had been closed in error by SEMO on the previous Operational Date 15/02/2015. | SEMO re-opened the EXT_EP_LOLP gate for the 16/02/2015 and Eirgrid IT resubmitted the file.The data feed was successfully received into the Market Systems at 10:02am. | Minor |
| 25/02/2015 | EA2 | Quality | SEMO | System | The publication of EWIC MIUNs for the Ex-Ante 2 (EA2) run for Trade Date $26/02/2015$ was delayed. | The MIUN calculator produced an error and a revised file was required. | Revised EWIC MIUNs were published at 13:24. | Minor |

Table 18 - Code Breaches - Pricing and Scheduling

SEMO - Settlements

| Ops Date Identified | Run Type | Quality or Timing | Party | Issue Type | Description | Cause | Resolution | T and SC Breach |
|---------------------|--------------------------------------|-------------------|-------|-------------|--|--|--|-----------------|
| 19/02/2015 | M+13 ENG & VMOC Statements | Quality | SEMO | Operational | M+13 Statements and Participant Information Reports (PIRs) for Billing Period Week 3 2014 were published after the 17:00 deadline. | The delay was due to wrong save case being used and was identified by a second controller. This led to all the checks being re-done and Statements and PIRs published the following morning. | An IP- rerun was carried out by IT to ensure that the correct figures were used in M13 resettlement. Statements were then sent out to participants the next morning 20/02/2015 | Minor |
| 19/02/2015 | Adhoc ENG Invoice | Timing | SEMO | Operational | Ad hoc Statements and Participant Information Reports (PIRs) for Billing Period Week 33 2012 were published after the 17:00 deadline. | Statements were delayed due to materiality not matching analyst calculations on the VPTG defect. | Schedules including the VPTG defect data were cancelled and M13 run with original schedules. | Minor |
| 23/02/2015 | Indicative Statements and PIRs | Timing | SEMO | Operational | Indicative Statements and PIRs for 22/02/2015 were published after the 17:00 deadline. | Due to an operational error 3 batches had to be run on Monday. Saturdays Indicaitve run was kicked off before Friday's which led to re-running of batches. | All batches were complete and 22/02/2015 were published 10 minutes outside the 17:00pm deadline | Minor |
| 26/02/2015 | Adhoc CAP Invoice | Quality | SEMO | Operational | Ad hoc Statements and Participant Information Reports (PIRs) for Billing Period Week 34 2012 published after the 17:00 deadline. | Statements, PIRs and Invoices were delayed due to an incorrect save case that was used for the VPTG defect | All statements, PIRs and invoices for week 34 2012 were published Monday 02/03/2015 | Minor |
| 27/02/2015 | Adhoc CAP Invoice | Timing | SEMO | Operational | Market message was issued to Participants as Statements, PIRs and Invoices were deferred for Week 34 2012 Ad hoc Energy Resettlement . | Invoices were delayed due to materiality not matching analyst calculations on the VPTG defect and incorrect files being used | All statements, PIRs and invoices for week 34 2012 were published Monday 02/03/2015 | Major |

Table 19 - Code Breaches - Settlements

SEMO - Funds Transfer

There were no issues to report in February 2015



Table 20 - Code Breaches - Funds Transfer

SEMO - Credit Management

There were no issues to report in February 2015

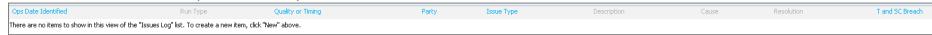


Table 21 - Code Breaches - Credit Risk Management

SEMO - Other

There were no issues to report in February 2015

| Ops Date Identified | Run Type | Quality or Timing | Party | Issue Type | Description | Cause | Resolution | T and SC Breach |
|---|---|-------------------|-------|------------|-------------|-------|------------|-----------------|
| There are no items to show in this view of the "Issue | es Log" list. To create a new item, click "Ne | w" above. | | | | | | |

Table 22 - Code Breaches - Other

9 Appendix B: List of Queries by Type

Data Queries

| Summary Title | Description ▼ | ID 🔻 | Logged On 🔻 | Date sent to MP 🔻 |
|-----------------------|---|------------------------|-------------|-------------------|
| Availability | Incorrect ACTAs were sent to the SEM for the following units at the following times;GU_400211 (Erne Unit 2) at 12:28 on the 12/02/2015GU_400120 (Sealrock Unit 3) at 00:30, 00:52 & 23:09 on the 12/02/2015 | GU_400211 GU_400120 | 2015-02-16 | 2014-12-23 |
| Dispatch instructions | Incorrect DIs were sent to the SEM for the following units at the following times;GU_401720 (Booltiagh Windfarm Phase 1) at 21:24 on the 12/02/2015GU_400120 (Sealrock Unit 3) at 00:30 and 00:52 on the 12/02/2015 | GU_401720 GU_400120 | 2015-02-16 | 2015-02-27 |

Table 23 - Data Queries

Settlement Queries

| Summary Title | Description | ID 🔻 | Logged On 🔻 | Date sent to MP 🔻 |
|---------------------|--|--|-------------|-------------------|
| Payment Calculation | Unit (GU_400200) AA1. Difference in Constraint Payments. Market Operator paid a start-up payment for this unit at 12:00, when no Sync instruction issued. | GU_400200 | 2015-02-23 | 2015-03-05 |
| Availability | There are a number of days in November when no EA values have been provided for unit GU_400211 ie 20th to 22nd and from 24th to 26th. A CPP values has been calculated for the unit on these days. Could you confirm the EA vulues used in settlement. Will send an attachment file by separate email. | GU_400211 | 2015-02-27 | 2015-03-06 |
| Availability | Incorrect Actual Availability and therefore Market Schedule Quantity for a number of curtailed VPTG's where Actual Output is greater than Time Weighted Average Outturn Availability which is resulting in settlement errors from 11th May 2014 to 15th Nov 2014. | Eirgrid | 2015-02-10 | 2014-12-11 |
| Payment Calculation | Query re the CPP calculated for the EWIC unit for a number of days in October. We have calculated a different value for the CPP on a number of days and in particular when the unit is importing. Specific dates where there is a difference are 2nd 16th 17th 18th 19th 21st 25th 26th and 31st. I will send a spreadsheet by separate email which gives a break-down by trading period. Could you plese review and advise. | | 2015-02-25 | 2015-03-05 |
| Meter Data | The meters were uncontactable for GU_400650 (Ballybane Windfarm Phase 1), this resulted in Backstop being sent to the SEM for all day (00:00-23:59) on the 26/01/2015. | GU_400650 - Ballybane Wind Farm Phase 1 | 2015-02-10 | 2015-02-13 |

Table 24 - Settlement Queries

10 Appendix C: List of All System Errors and Failures

The definitions of the statuses used for the List of All System Errors and Failures are:

- In Progress: Fix being identified and implemented.
- Resolved: Fix has been implemented, but reruns have not been performed.
- Closed: Required reruns have been performed and error-failure has been completely rectified.

Note: Items in the List of All System Errors and Failures that have status 'Closed' in this month's report will not appear in subsequent Monthly Market Operator Reports as they are no longer open issues.

| Issue No. | Description | Effect | Fixed from | Re-Pricing | Resettlement | Status |
|-----------|--|--------|------------|------------|--------------|--------|
| ABB2015- | IP - Heat state issue on new unit | | | | | |
| 137670 | IP - Heat state issue on new unit | - | - | - | - | - |
| ABB2015- | Single ramp rate (CR255) | | | | | |
| 138021 | Single ramp rate (CR255) | - | - | 1 | - | - |
| ABB2015- | SM INTCON IART web-service not working | - | = | - | = | - |
| 137973 | Sini In LCOIN INV. Men-selvice lint motklild | | | | | |

Table 25 - List of System Errors and Failures

11 Appendix D: Details of Operational Timings

Market Schedule and Price Runs

| | EA1 Po | ostings | EA2 Po | ostings | WD1 P | ostings | EP1Pc | ostings | EP2 Po | ostings |
|-------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| Operational | | | | | | | | | | |
| Day | Target | Actual |
| 01/02/2015 | 11:00 | 09:54 | 13:00 | 11:49 | 09:30 | 08:16 | 16:00 | 14:42 | 17:00 | 14:37 |
| 02/02/2015 | 11:00 | 10:00 | 13:00 | 11:48 | 09:30 | 08:24 | 16:00 | 14:55 | 17:00 | 14:32 |
| 03/02/2015 | 11:00 | 09:56 | 13:00 | 11:54 | 09:30 | 08:36 | 16:00 | 14:35 | 17:00 | 14:24 |
| 04/02/2015 | 11:00 | 10:01 | 13:00 | 11:59 | 09:30 | 08:35 | 16:00 | 14:38 | 17:00 | 14:32 |
| 05/02/2015 | 11:00 | 09:56 | 13:00 | 11:57 | 09:30 | 08:34 | 16:00 | 14:34 | 17:00 | 14:38 |
| 06/02/2015 | 11:00 | 09:57 | 13:00 | 11:58 | 09:30 | 08:39 | 16:00 | 14:26 | 17:00 | 14:40 |
| 07/02/2015 | 11:00 | 09:57 | 13:00 | 12:00 | 09:30 | 08:31 | 16:00 | 14:34 | 17:00 | 14:51 |
| 08/02/2015 | 11:00 | 10:02 | 13:00 | 11:57 | 09:30 | 08:30 | 16:00 | 14:36 | 17:00 | 14:35 |
| 09/02/2015 | 11:00 | 10:00 | 13:00 | 11:52 | 09:30 | 08:32 | 16:00 | 14:40 | 17:00 | 14:36 |
| 10/02/2015 | 11:00 | 10:04 | 13:00 | 12:02 | 09:30 | 08:34 | 16:00 | 14:54 | 17:00 | 14:31 |
| 11/02/2015 | 11:00 | 10:12 | 13:00 | 12:06 | 09:30 | 08:33 | 16:00 | 14:37 | 17:00 | 14:29 |
| 12/02/2015 | 11:00 | 10:01 | 13:00 | 12:00 | 09:30 | 08:35 | 16:00 | 14:38 | 17:00 | 14:35 |
| 13/02/2015 | 11:00 | 09:57 | 13:00 | 11:54 | 09:30 | 08:21 | 16:00 | 14:34 | 17:00 | 14:30 |
| 14/02/2015 | 11:00 | 09:56 | 13:00 | 12:19 | 09:30 | 08:23 | 16:00 | 14:24 | 17:00 | 14:38 |
| 15/02/2015 | 11:00 | 09:57 | 13:00 | 11:56 | 09:30 | 08:26 | 16:00 | 14:37 | 17:00 | 14:27 |
| 16/02/2015 | 11:00 | 09:56 | 13:00 | 11:56 | 09:30 | 08:17 | 16:00 | 14:32 | 17:00 | 14:31 |
| 17/02/2015 | 11:00 | 09:59 | 13:00 | 12:00 | 09:30 | 08:30 | 16:00 | 14:00 | 17:00 | 14:30 |
| 18/02/2015 | 11:00 | 09:51 | 13:00 | 11:56 | 09:30 | 08:30 | 16:00 | 14:29 | 17:00 | 14:24 |
| 19/02/2015 | 11:00 | 09:54 | 13:00 | 12:03 | 09:30 | 08:28 | 16:00 | 14:33 | 17:00 | 14:27 |
| 20/02/2015 | 11:00 | 09:55 | 13:00 | 11:47 | 09:30 | 08:28 | 16:00 | 14:27 | 17:00 | 14:33 |
| 21/02/2015 | 11:00 | 09:55 | 13:00 | 11:45 | 09:30 | 08:33 | 16:00 | 14:27 | 17:00 | 14:24 |
| 22/02/2015 | 11:00 | 10:19 | 13:00 | 11:57 | 09:30 | 08:32 | 16:00 | 14:28 | 17:00 | 14:21 |
| 23/02/2015 | 11:00 | 10:09 | 13:00 | 11:59 | 09:30 | 08:25 | 16:00 | 14:53 | 17:00 | 14:30 |
| 24/02/2015 | 11:00 | 09:59 | 13:00 | 11:54 | 09:30 | 08:52 | 16:00 | 14:26 | 17:00 | 14:39 |
| 25/02/2015 | 11:00 | 09:55 | 13:00 | 11:54 | 09:30 | 08:30 | 16:00 | 14:23 | 17:00 | 14:35 |
| 26/02/2015 | 11:00 | 09:56 | 13:00 | 12:00 | 09:30 | 08:26 | 16:00 | 14:32 | 17:00 | 14:38 |
| 27/02/2015 | 11:00 | 09:52 | 13:00 | 11:53 | 09:30 | 08:27 | 16:00 | 14:50 | 17:00 | 14:30 |
| 28/02/2015 | 11:00 | 10:00 | 13:00 | 11:55 | 09:30 | 08:33 | 16:00 | 14:38 | 17:00 | 14:39 |

Table 26 – MSP Runs

Settlement Runs

| | INDICATIVE | | | | INITIAL | | | |
|------------|------------|------------|--------|--------|------------|------------|--------|--------|
| Trading | Target | Actual | Target | Actual | Trading | Actual | Target | Actual |
| Day | Date | Date | Time | Time | Day | Date | Time | Time |
| 01/02/2015 | 02/02/2015 | 02/02/2015 | 17:00 | 15:36 | 01/02/2015 | 06/02/2015 | 12:00 | 08:09 |
| 02/02/2015 | 03/02/2015 | 03/02/2015 | 17:00 | 16:15 | 02/02/2015 | 09/02/2015 | 12:00 | 08:10 |
| 03/02/2015 | 04/02/2015 | 04/02/2015 | 17:00 | 16:24 | 03/02/2015 | 10/02/2015 | 12:00 | 07:40 |
| 04/02/2015 | 05/02/2015 | 05/02/2015 | 17:00 | 16:05 | 04/02/2015 | 11/02/2015 | 12:00 | 08:17 |
| 05/02/2015 | 06/02/2015 | 06/02/2015 | 17:00 | 16:08 | 05/02/2015 | 12/02/2015 | 12:00 | 08:02 |
| 06/02/2015 | 09/02/2015 | 09/02/2015 | 17:00 | 11:29 | 06/02/2015 | 13/02/2015 | 12:00 | 12:35 |
| 07/02/2015 | 09/02/2015 | 09/02/2015 | 17:00 | 12:45 | 07/02/2015 | 13/02/2015 | 12:00 | 14:04 |
| 08/02/2015 | 09/02/2015 | 09/02/2015 | 17:00 | 15:55 | 08/02/2015 | 13/02/2015 | 12:00 | 09:56 |
| 09/02/2015 | 10/02/2015 | 10/02/2015 | 17:00 | 15:51 | 09/02/2015 | 16/02/2015 | 12:00 | 08:07 |
| 10/02/2015 | 11/02/2015 | 11/02/2015 | 17:00 | 16:10 | 10/02/2015 | 17/02/2015 | 12:00 | 07:52 |
| 11/02/2015 | 12/02/2015 | 12/02/2015 | 17:00 | 15:44 | 11/02/2015 | 18/02/2015 | 12:00 | 09:16 |
| 12/02/2015 | 13/02/2015 | 13/02/2015 | 17:00 | 15:54 | 12/02/2015 | 19/02/2015 | 12:00 | 07:24 |
| 13/02/2015 | 16/02/2015 | 16/02/2015 | 17:00 | 12:20 | 13/02/2015 | 20/02/2015 | 12:00 | 11:45 |
| 14/02/2015 | 16/02/2015 | 16/02/2015 | 17:00 | 12:56 | 14/02/2015 | 20/02/2015 | 12:00 | 12:05 |
| 15/02/2015 | 16/02/2015 | 16/02/2015 | 17:00 | 15:47 | 15/02/2015 | 20/02/2015 | 12:00 | 08:09 |
| 16/02/2015 | 17/02/2015 | 17/02/2015 | 17:00 | 15:38 | 16/02/2015 | 23/02/2015 | 12:00 | 08:21 |
| 17/02/2015 | 18/02/2015 | 18/02/2015 | 17:00 | 16:28 | 17/02/2015 | 24/02/2015 | 12:00 | 08:15 |
| 18/02/2015 | 19/02/2015 | 19/02/2015 | 17:00 | 15:23 | 18/02/2015 | 25/02/2015 | 12:00 | 08:47 |
| 19/02/2015 | 20/02/2015 | 20/02/2015 | 17:00 | 15:49 | 19/02/2015 | 26/02/2015 | 12:00 | 08:30 |
| 20/02/2015 | 23/02/2015 | 23/02/2015 | 17:00 | 12:59 | 20/02/2015 | 27/02/2015 | 12:00 | 12:45 |
| 21/02/2015 | 23/02/2015 | 23/02/2015 | 17:00 | 16:52 | 21/02/2015 | 27/02/2015 | 12:00 | 13:59 |
| 22/02/2015 | 23/02/2015 | 23/02/2015 | 17:00 | 17:07 | 22/02/2015 | 27/02/2015 | 12:00 | 08:55 |
| 23/02/2015 | 24/02/2015 | 24/02/2015 | 17:00 | 16:25 | 23/02/2015 | 02/03/2015 | 12:00 | 08:39 |
| 24/02/2015 | 25/02/2015 | 25/02/2015 | 17:00 | 15:39 | 24/02/2015 | 03/03/2015 | 12:00 | 08:25 |
| 25/02/2015 | 26/02/2015 | 26/02/2015 | 17:00 | 15:36 | 25/02/2015 | 04/03/2015 | 12:00 | 08:10 |
| 26/02/2015 | 27/02/2015 | 27/02/2015 | 17:00 | 15:21 | 26/02/2015 | 05/03/2015 | 12:00 | 08:03 |
| 27/02/2015 | 02/03/2015 | 02/03/2015 | 17:00 | 11:58 | 27/02/2015 | 06/03/2015 | 12:00 | 12:14 |
| 28/02/2015 | 02/03/2015 | 02/03/2015 | 17:00 | 14:02 | 28/02/2015 | 06/03/2015 | 12:00 | 13:31 |

Table 27 - Settlement Runs

12 Appendix E: Imperfections Charge

This appendix provides daily data for the Constraint Payments, Uninstructed Imbalance Payments and Imperfections Charges, and as well as the weekly values of Make Whole Payments and Testing Charges.

The following table is updated to take account of the values calculated in the Initial Settlement runs only.

Historical information will be shown in Appendix E until completion of the current financial year. Information prior to that can be found in previous Monthly Market Operator Reports.

| Date | Constraints Payments | Uninstructed Imbalances Payments | Imperfections Charges |
|------------|----------------------|-------------------------------------|-----------------------|
| 01/10/2014 | €227,003.16 | €4,663.19 | -€497,010.43 |
| 02/10/2014 | €735,796.33 | -€19,882.49 | -€485,485.43 |
| 03/10/2014 | €614,655.29 | €10,871.94 | -€504,078.89 |
| 04/10/2014 | €431,006.78 | -€7,434.77 | -€448,528.17 |
| 05/10/2014 | €824,385.72 | €10,977.87 | -€414,125.03 |
| 06/10/2014 | €656,891.36 | -€20,536.24 | -€496,825.27 |
| 07/10/2014 | €271,569.15 | €7,652.10 | -€515,909.62 |
| 08/10/2014 | €317,802.51 | -€36,024.01 | -€520,694.36 |
| 09/10/2014 | €271,129.06 | -€14,582.31 | -€525,428.89 |
| 10/10/2014 | €442,983.70 | -€26,317.26 | -€517,313.97 |
| 11/10/2014 | €311,801.03 | €11,849.83 | -€473,083.86 |
| 12/10/2014 | €401,470.02 | -€7,407.00 | -€451,034.95 |
| 13/10/2014 | €353,395.99 | -€24,498.55 | -€513,674.01 |
| 14/10/2014 | €358,013.74 | -€19,066.88 | -€523,546.32 |
| 15/10/2014 | €428,117.82 | -€853.11 | -€511,064.60 |
| 16/10/2014 | €310,763.65 | -€12,618.38 | -€513,456.78 |
| 17/10/2014 | €483,353.64 | -€5,253.97 | -€495,989.17 |
| 18/10/2014 | €1,079,153.36 | €23,841.90 | -€428,037.24 |
| 19/10/2014 | €506,373.44 | -€2,840.01 | -€416,208.56 |
| 20/10/2014 | €565,796.01 | -€13,121.95 | -€490,614.73 |
| 21/10/2014 | €722,480.43 | €17,262.53 | -€491,996.93 |
| 22/10/2014 | €622,659.96 | -€35,249.53 | -€515,127.40 |
| 23/10/2014 | €299,585.53 | €2,462.07 | -€513,013.48 |
| 24/10/2014 | €505,499.46 | -€8,503.06 | -€505,991.61 |
| 25/10/2014 | €899,840.05 | €24,936.45 | -€439,804.29 |
| 26/10/2014 | €867,189.29 | -€8,010.50 | -€428,234.85 |
| 27/10/2014 | €739,332.30 | €6,690.55 | -€444,796.70 |
| 28/10/2014 | €553,302.80 | -€61,012.80 | -€519,037.78 |
| 29/10/2014 | €754,919.24 | -€6,314.82 | -€530,046.54 |
| 30/10/2014 | €636,202.61 | -€3,395.44 | -€513,730.14 |
| 31/10/2014 | €508,522.20 | -€17,778.71 | -€506,014.82 |
| 01/11/2014 | €546,540.25 | -€6,912.86 | -€457,086.94 |
| 02/11/2014 | €318,890.98 | -€12,990.39 | -€443,511.55 |
| 03/11/2014 | €569,073.38 | -€4,244.85 | -€532,442.41 |
| 04/11/2014 | €669,098.98 | -€16,550.06 | -€528,960.67 |
| 05/11/2014 | €546,197.90 | -€18,613.60 | -€550,138.29 |
| 06/11/2014 | €637,275.88 | -€14,424.86 | -€537,063.83 |
| 07/11/2014 | €382,071.17 | -€11,250.48 | -€531,305.30 |
| 08/11/2014 | €416,600.72 | -€18,592.20 | -€500,732.00 |
| 09/11/2014 | €324,554.00 | -€6,024.57 | -€481,392.83 |

| 10/11/2014 | 0500 050 03 | C42.75C.0C | CE 40 CZE 47 |
|------------|---------------|-------------|--------------|
| 10/11/2014 | €506,959.62 | -€12,756.86 | -€540,675.17 |
| 11/11/2014 | €305,371.45 | -€44,629.39 | -€565,550.06 |
| 12/11/2014 | €532,498.02 | -€28,281.20 | -€554,600.49 |
| 13/11/2014 | €345,990.75 | -€17,901.27 | -€553,923.16 |
| 14/11/2014 | €343,466.61 | -€1,320.38 | -€534,716.18 |
| 15/11/2014 | €494,457.91 | €3,019.64 | -€499,765.88 |
| 16/11/2014 | €360,376.17 | €7,373.68 | -€482,898.42 |
| 17/11/2014 | €553,003.49 | -€24,556.35 | -€545,895.52 |
| 18/11/2014 | €415,247.34 | €4,362.82 | -€543,481.42 |
| 19/11/2014 | €534,047.47 | -€12,653.01 | -€548,548.06 |
| 20/11/2014 | €548,216.05 | -€26,506.42 | -€571,397.50 |
| 21/11/2014 | €351,743.55 | -€34,277.81 | -€542,644.18 |
| 22/11/2014 | €402,367.39 | -€15,880.02 | -€504,134.67 |
| 23/11/2014 | €543,674.52 | -€9,757.73 | -€492,515.83 |
| 24/11/2014 | €436,153.86 | -€3,275.68 | -€568,242.69 |
| 25/11/2014 | €252,433.54 | -€17,224.01 | -€582,837.38 |
| 26/11/2014 | €268,639.50 | -€6,672.97 | -€590,843.52 |
| 27/11/2014 | €477,133.30 | -€17,221.50 | -€571,833.74 |
| 28/11/2014 | €514,059.40 | -€24,958.57 | -€548,216.58 |
| 29/11/2014 | €466,095.46 | -€17,684.09 | -€518,324.65 |
| 30/11/2014 | €426,493.00 | €228.22 | -€497,681.99 |
| 01/12/2014 | €425,729.84 | -€17,667.29 | -€564,559.17 |
| 02/12/2014 | €608,884.75 | -€9,337.96 | -€580,266.39 |
| 03/12/2014 | €506,617.59 | -€48,599.53 | -€604,794.55 |
| 04/12/2014 | €524,348.76 | -€26,701.42 | -€598,118.36 |
| 05/12/2014 | €461,085.09 | -€25,561.67 | -€572,477.87 |
| 06/12/2014 | €568,753.24 | -€12,613.70 | -€516,202.71 |
| 07/12/2014 | €484,127.53 | €2,302.13 | -€486,982.31 |
| 08/12/2014 | €885,938.85 | -€37,551.38 | -€584,787.94 |
| 09/12/2014 | €718,257.00 | -€19,795.27 | -€567,508.60 |
| 10/12/2014 | €694,745.69 | -€28,671.71 | -€573,652.69 |
| 11/12/2014 | €523,434.14 | -€5,545.19 | -€588,404.70 |
| 12/12/2014 | €674,997.85 | -€30,954.05 | -€590,328.30 |
| 13/12/2014 | €574,892.66 | -€14,185.39 | -€545,225.54 |
| 14/12/2014 | €628,744.88 | -€7,460.18 | -€494,683.75 |
| 15/12/2014 | €586,494.13 | -€52,410.95 | -€589,165.45 |
| 16/12/2014 | €596,239.45 | -€17,823.19 | -€593,950.92 |
| 17/12/2014 | €709,290.15 | -€19,551.47 | -€567,440.23 |
| 18/12/2014 | €896,816.00 | €2,905.28 | -€554,081.45 |
| 19/12/2014 | €995,932.96 | €4,662.09 | -€543,943.87 |
| 20/12/2014 | €505,276.32 | €4,952.12 | -€510,278.41 |
| 21/12/2014 | €1,032,186.15 | €3,856.82 | -€470,790.42 |
| 22/12/2014 | €783,718.05 | €19,779.93 | -€528,728.17 |
| 23/12/2014 | €580,782.79 | €13,315.83 | -€531,858.69 |
| 24/12/2014 | €522,323.53 | -€1,231.24 | -€497,446.95 |
| 25/12/2014 | €365,691.72 | €1,963.64 | -€464,366.17 |
| 26/12/2014 | €540,788.12 | -€8,172.04 | -€457,472.59 |
| 27/12/2014 | €646,748.39 | €14,909.59 | -€472,798.28 |
| 28/12/2014 | €607,407.31 | €7,022.19 | -€497,727.79 |
| 29/12/2014 | €555,367.66 | €7,365.97 | -€524,246.05 |
| 30/12/2014 | €640,363.39 | €14,384.93 | -€505,239.86 |
| 31/12/2014 | €603,204.62 | €25,349.47 | -€482,895.60 |
| 01/01/2015 | €1,183,313.74 | €22,302.55 | -€432,637.80 |

| 02/01/2015 | €719,060.46 | €7,180.94 | -€488,863.06 |
|--------------------------|----------------------------|-------------------------|--------------|
| 03/01/2015 | €347,426.55 | €22,383.30 | -€509,883.65 |
| 04/01/2015 | €368,525.85 | €17,445.50 | -€492,762.63 |
| 05/01/2015 | €858,552.99 | -€57,810.06 | -€547,249.34 |
| 06/01/2015 | €846,901.18 | €24,062.40 | -€565,026.70 |
| 07/01/2015 | €754,789.55 | €18,197.44 | -€553,124.60 |
| 08/01/2015 | €738,052.46 | €5,912.21 | -€560,161.59 |
| 09/01/2015 | €799,401.56 | €25,467.67 | -€544,123.83 |
| 10/01/2015 | €471,870.80 | €23,541.24 | -€489,886.95 |
| 11/01/2015 | €804,037.00 | €7,957.03 | -€475,707.54 |
| 12/01/2015 | €532,334.91 | -€28,660.44 | -€547,621.88 |
| 13/01/2015 | €657,677.89 | €13,214.17 | -€585,068.72 |
| 14/01/2015 | €769,303.38 | -€3,725.21 | -€591,675.05 |
| 15/01/2015 | €571,780.65 | €11,193.51 | -€586,646.16 |
| 16/01/2015 | €716,352.94 | -€13,748.94 | -€590,495.78 |
| 17/01/2015 | €377,678.95 | €8,181.35 | -€550,070.38 |
| 18/01/2015 | €166,250.30 | -€3,020.40 | -€514,226.93 |
| 19/01/2015 | €698,080.04 | -€37,908.42 | -€609,509.53 |
| 20/01/2015 | €437,319.37 | -€40,386.17 | -€614,164.65 |
| 21/01/2015 | €667,403.57 | -€48,191.01 | -€614,449.45 |
| 22/01/2015 | €542,321.93 | -€24,334.20 | -€614,473.92 |
| 23/01/2015 | €461,543.80 | -€1,291.99 | -€571,701.09 |
| 24/01/2015 | €375,088.02 | €3,285.01 | -€529,114.19 |
| 25/01/2015 | €370,985.65 | -€4,188.67 | -€488,904.88 |
| 26/01/2015 | €761,148.58 | -€5,809.04 | -€566,069.74 |
| 27/01/2015 | €496,305.71 | €3,197.27 | -€578,227.32 |
| 28/01/2015 | €679,942.31 | -€5,819.24 | -€567,278.15 |
| 29/01/2015 | €842,221.29 | -€19,380.22 | -€582,068.03 |
| 30/01/2015 | €498,670.69 | -€19,380.22 | -€568,791.17 |
| 31/01/2015 | €621,711.25 | €5,481.92 | -€508,791.17 |
| | | ÷5,481.92 -€7,159.85 | |
| 01/02/2015 | €465,811.18 | • | -€522,488.66 |
| 02/02/2015 03/02/2015 | €600,896.72 | -€25,058.44 | -€612,427.31 |
| | €622,108.61 €680,810,77 | -€646.83 | -€612,448.65 |
| 04/02/2015 | €680,810.77 | €3,948.07 | -€619,315.92 |
| 05/02/2015 | €524,358.46 | -€557.07 | -€614,409.37 |
| 06/02/2015 | €507,125.10 | -€3,973.79 | -€600,953.78 |
| 07/02/2015 | €552,603.96 | -€3,844.92 | -€533,253.15 |
| 08/02/2015 | €513,181.80 | -€8,706.01 | -€526,790.04 |
| 09/02/2015 | €721,677.70 | -€75,869.33 | -€603,738.54 |
| 10/02/2015 | €612,792.69 | -€54,689.56 | -€615,533.69 |
| 11/02/2015 | €397,523.20 | -€49,206.80 | -€612,372.90 |
| 12/02/2015 | €584,234.54 | -€9,961.83 | -€589,104.96 |
| 13/02/2015 | €581,694.45 | -€18,426.02 | -€571,753.77 |
| 14/02/2015 | €519,304.93 | -€11,018.35 | -€524,311.37 |
| 15/02/2015 | €402,543.48 | €350.55 | -€482,429.93 |
| 16/02/2015 | €539,037.68 | -€34,021.35 | -€564,140.28 |
| 17/02/2015 | €542,064.44 | -€575.68 | -€567,853.68 |
| 18/02/2015 | €602,625.88 | -€7,288.26 | -€546,880.62 |
| 19/02/2015 | €512,519.51 | €18,470.83 | -€556,672.04 |
| 20/02/2015 | €592,720.94 | -€10,749.31 | -€567,934.87 |
| 21/02/2015 | €632,840.91 | €17,014.71 | -€511,712.83 |
| 22/02/2015 | €870,894.49 | €1,282.86 | -€484,230.97 |
| 23/02/2015 | €674,860.17 | -€5,480.97 | -€557,984.41 |
| 24/02/2015 | €512,106.06 | -€7,870.22 | -€569,013.81 |

| 25/02/2015 | €642,952.47 | -€31,481.05 | -€567,195.52 | |
|------------|-------------|--------------|--------------|---|
| 26/02/2015 | €488,203.62 | -€68,355.71 | -€541,080.48 | |
| 27/02/2015 | €702,055.03 | -€278,358.30 | -€551,568.91 | |
| 28/02/2015 | €763.470.11 | -€156.795.83 | -€490.683.19 | 1 |

Table 28 - Constraint Payments, Uninstructed Imbalance Payments, and Imperfections Charges

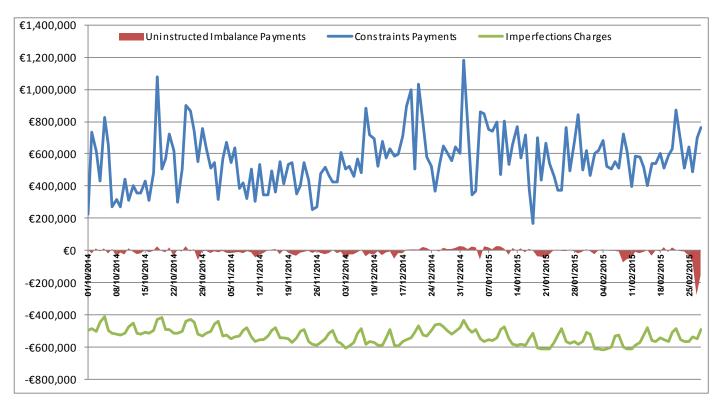


Figure 24 - Constraint Payments, Uninstructed Imbalance Payments, and Imperfections Charges

| Week No | Make Whole |
|---------|-------------|
| | Payments |
| 38 | €202,188.33 |
| 39 | €225,015.64 |
| 40 | €280,671.13 |
| 41 | €186,568.53 |
| 42 | €159,900.73 |
| 43 | €172,804.93 |
| 44 | €117,287.97 |
| 45 | €69,322.58 |
| 46 | €151,346.18 |
| 47 | €116,593.30 |
| 48 | €89,395.20 |
| 49 | €75,360.41 |
| 50 | €169,324.41 |
| 51 | €121,591.48 |
| 52 | €55,670.15 |
| 1 | €80,155.98 |
| 2 | €72,635.72 |
| 3 | €117,670.85 |
| 4 | €162,664.95 |

| 5 | €78,694.34 |
|---|-------------|
| 6 | €58,735.16 |
| 7 | €160,187.55 |
| 8 | €132,758.27 |

Table 29 - Make Whole Payments

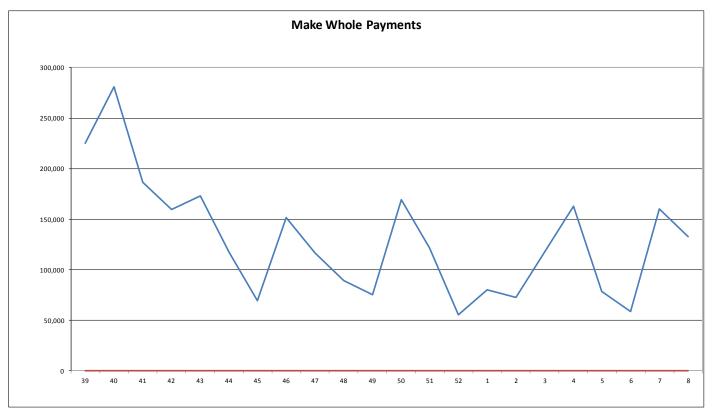


Figure 25 - Make Whole Payments

| Week No | Testing Charges |
|---------|-----------------|
| 39 | -€64,349.25 |
| 40 | -€23,212.88 |
| 41 | -€8,173.18 |
| 42 | -€106,220.13 |
| 43 | -€106,488.24 |
| 44 | -€74,217.72 |
| 45 | -€13,149.01 |
| 46 | €31,147.27 |
| 47 | -€34,993.39 |
| 48 | -€8,926.09 |
| 49 | -€31,711.41 |
| 50 | -€91,587.25 |
| 51 | -€43,797.04 |
| 52 | €0.00 |
| 1 | -€69,863.70 |
| 2 | €0 |
| 3 | €0 |
| 4 | €0 |
| 5 | -€116,570.26 |
| 6 | -€15,192.63 |

| 7 | -€9,394.34 |
|---|-------------|
| 8 | -€56,342.39 |

Table 30 - Testing Charges

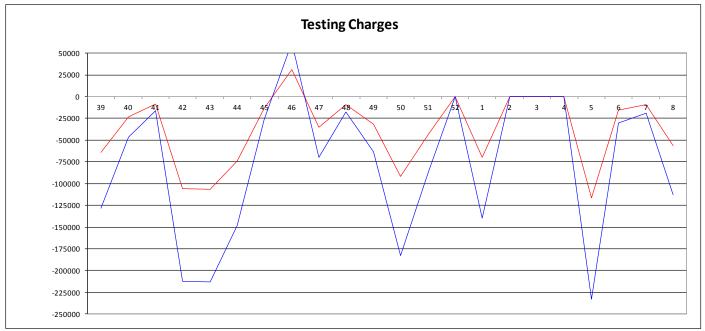


Figure 26 - Testing Charges

13 Appendix F: Default Commercial Offer Data Used

The table below lists for each unit the number of times in operations during February 2015 where the Commercial Offer Data was based on a Participant submission within the Market window, or based on Standing Data or Default Data submitted.

| PNAME | RNAME | Manual | Adjusted | Standing | COUNT |
|-----------|------------|--------|----------|----------|-------|
| PT_400090 | DSU_401620 | | | 28 | 28 |
| PT_400090 | DSU_401610 | 27 | | | 27 |
| PT_400138 | DSU_401590 | 28 | | | 28 |
| PT_400111 | DSU_401390 | | 9 | | 9 |
| PT_400116 | DSU_401400 | 28 | | | 28 |
| PT_400090 | DSU_401610 | | | 2 | 2 |
| PT_400111 | DSU_401390 | | | 1 | 1 |
| PT_400090 | DSU_401270 | 28 | | | 28 |
| PT_400106 | DSU_401330 | 36 | | | 36 |
| PT_400111 | DSU_401390 | 19 | | | 19 |
| PT_400133 | DSU_401530 | 28 | | | 28 |
| PT_400133 | DSU_401530 | | | 2 | 2 |
| PT_400124 | DSU_401490 | 29 | | | 29 |
| PT_400024 | GU_400120 | 28 | | | 28 |
| PT_400024 | GU_400121 | 28 | | | 28 |
| PT_400026 | GU_400140 | 28 | | | 28 |
| PT_400030 | GU_400180 | 45 | | | 45 |
| PT_400030 | GU_400181 | 46 | | | 46 |
| PT_400030 | GU_400182 | 46 | | | 46 |
| PT_400030 | GU_400183 | 41 | | | 41 |
| PT_400030 | GU_400200 | 43 | | | 43 |
| PT_400030 | GU_400201 | 43 | | | 43 |
| PT_400030 | GU_400202 | 41 | | | 41 |
| PT_400030 | GU_400203 | 44 | | | 44 |
| PT_400030 | GU_400210 | 42 | | | 42 |
| PT_400030 | GU_400211 | 41 | | | 41 |
| PT_400030 | GU_400220 | 40 | | | 40 |
| PT_400030 | GU_400221 | 41 | | | 41 |
| PT_400030 | GU_400240 | 42 | | | 42 |
| PT_400030 | GU_400250 | 41 | | | 41 |
| PT_400030 | GU_400251 | 42 | | | 42 |
| PT_400030 | GU_400252 | 41 | | | 41 |
| PT_400030 | GU_400260 | 41 | | | 41 |
| PT_400030 | GU_400270 | 42 | | | 42 |
| PT_400030 | GU_400271 | 42 | | | 42 |
| PT_400030 | GU_400272 | 43 | | | 43 |
| PT_400030 | GU_400280 | 40 | | | 40 |
| PT_400030 | GU_400281 | 40 | | | 40 |
| PT_400030 | GU_400290 | 41 | | | 41 |
| PT_400030 | GU_400300 | 46 | | | 46 |
| PT_400030 | GU_400311 | 46 | | | 46 |
| PT_400030 | GU_400323 | 45 | | | 45 |
| PT_400030 | GU_400360 | 39 | | | 39 |
| PT_400030 | GU_400361 | 39 | | | 39 |
| PT_400030 | GU_400362 | 40 | | | 40 |
| PT_400030 | GU_400363 | 40 | | | 40 |

| PT 400030 | GU 400370 | 41 | 41 |
|------------------------|------------------------|----------|----------|
| PT 400030 | GU 400850 | 46 | 46 |
| PT 400032 | GU 400430 | 26 | 26 |
| PT 400034 | GU 400940 | 28 | 28 |
| PT 400034 | GU 401090 | 27 | 27 |
| PT 400034 | GU 401440 | 28 | 28 |
| PT 400035 | GU 400480 | 53 | 53 |
| PT 400037 | GU 400500 | 30 | 30 |
| PT 400041 | GU 400530 | 51 | 51 |
| PT 400041 | GU 400540 | 53 | 53 |
| PT 400054 | GU_400620 | 28 | 28 |
| PT 400055 | GU 400630 | 27 | 27 |
| PT 400064 | GU 400750 | 28 | 28 |
| PT 400064 | GU 400751 | 28 | 28 |
| PT 400064 | GU 400752 | 28 | 28 |
| PT 400064 | GU 400753 | 28 | 28 |
| PT 400064 | GU 400754 | 28 | 28 |
| PT 400064 | GU 400760 | 28 | 28 |
| PT 400064 | GU 400761 | 28 | 28 |
| PT 400064 | GU 400762 | 28 | 28 |
| PT 400064 | GU_400702 GU_400770 | 28 | 28 |
| PT 400064 | GU 400771 | 28 | 28 |
| PT 400064 | GU 400780 | 28 | 28 |
| PT 400064 | GU_400780 | 28 | 28 |
| PT 400075 | GU_400781 | 74 | 74 |
| PT_400073 | GU 400950 | 27 | 27 |
| PT_400077 PT_400078 | GU_400930 GU 401010 | 28 | 28 |
| PT_400078 | GU 401011 | 28 | 28 |
| PT_400078 | GU_401011 | 8 | 8 |
| PT_400087 PT_400148 | GU_401230 GU_401690 | 12 | 12 |
| PT 400148 | GU 401770 | 12 | 12 |
| PT_400131 | GU_401770 | 38 | 38 |
| PT_500024 | GU_500040 | 28 | 28 |
| PT_500024 PT_500027 | | | - |
| PT_500027 | GU_500130 GU_500131 | 80 | 80 |
| PT_500027 | GU_500131 | 80 | 80 80 |
| PT_500027 | GU_500140 | 17 | 17 |
| PT_500032 PT_500040 | GU_501290 GU 500280 | 28 | 28 |
| PT_500040 | GU_500280 | 28 | 28 |
| PT_500040 PT_500040 | GU_500281 | 28 | 28 |
| PT_500040 PT_500040 | GU_500282 | 28 | 28 |
| PT_500040 PT_500040 | GU_500284 | 28 | 28 |
| PT_500040 PT_500045 | GU_500264 GU_500820 | 28 | 28 |
| PT_500045 | GU_500820 | 28 | 28 |
| PT_500045 | GU_500821 | 28 | 28 |
| PT_500045 | GU_500823 | 28 | 28 |
| PT_500045 PT_500045 | GU_500823 GU 500824 | 28 | 28 |
| PT_500045 PT_500045 | GU_500824 GU_500825 | 28 | 28 |
| PT_500045 PT_500048 | GU_500825 GU_500904 | 45 | 45 |
| PT_500048 PT_500050 | GU_500904 GU 501040 | 27 | 27 |
| PT_500050 PT_500050 | GU_501040 GU_501050 | 26 | 26 |
| PT_500050 PT_500050 | GU_501050 GU 501150 | | 27 |
| PT_500050 PT_500050 | GU_501150 GU 501190 | 27 27 | 27 |
| PT_500050 PT_500053 | GU_501190 | 28 | 28 |
| F1_00003 | 30_301130 | 20 | 28 |

| PT_400021 GU_400050 28 28 28 28 29 28 29 28 28 | PT 500066 | GU 501210 | 27 | | 27 |
|--|-----------|-----------|----|----|----|
| PT_400021 GU_400060 28 28 28 28 PT_400021 GU_400060 28 28 28 PT_400021 GU_400070 28 28 28 PT_400021 GU_400080 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400900 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_401080 28 28 28 PT_400025 GU_400130 28 28 28 PT_400025 GU_400130 28 28 28 PT_400030 GU_400310 28 28 28 PT_400033 GU_400310 28 28 28 PT_400033 GU_400430 2 2 2 PT_400033 GU_400430 2 2 2 PT_400033 GU_400550 S 28 28 PT_400050 GU_400660 GU_400150 GU_401150 GU_401150 GU_401150 GU_401150 GU_401150 GU_401150 GU_401240 GU_401150 GU_400650 GU_401150 GU_401150 GU_400650 GU_401150 GU_401150 GU_400650 GU_401150 GU_401150 GU_400650 GU_401150 GU_401 | | _ | 21 | 28 | |
| PT_400021 GU_400070 28 28 28 PT_400021 GU_400070 28 28 28 PT_400021 GU_400080 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400910 28 28 28 PT_400021 GU_400910 28 28 28 PT_400021 GU_400920 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401600 28 28 PT_400021 GU_401600 28 28 28 PT_400021 GU_401600 28 28 PT_400021 GU_401600 28 28 PT_400021 GU_401600 28 28 PT_400021 GU_401600 28 28 PT_400031 GU_401400 28 28 PT_400032 GU_400130 28 28 PT_400033 GU_400430 22 2 PT_400033 GU_400430 2 2 2 PT_400034 GU_400430 1 1 PT_400038 GU_400650 28 28 28 PT_400050 GU_400650 GU_400660 28 28 28 PT_400050 GU_401660 28 28 28 PT_400050 GU_401660 GU_401660 GU_401660 GU_401660 GU_401660 GU_401660 GU_401660 GU_401660 GU_401600 GU_4001600 | | | | | |
| PT_400021 GU_400080 28 28 28 PT_400021 GU_400080 28 28 28 PT_400021 GU_400080 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400900 28 28 28 PT_400021 GU_400910 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401000 28 28 28 PT_400021 GU_401000 28 28 28 PT_400021 GU_401000 28 28 28 PT_400025 GU_400130 28 28 PT_400025 GU_400130 28 28 PT_400032 GU_400130 28 28 PT_400033 GU_400310 28 28 PT_400034 GU_401090 1 1 1 PT_400030 GU_400650 GU_400650 28 28 28 PT_400050 GU_400650 GU_400660 28 28 28 PT_400050 GU_400660 GU_40660 | | _ | | | |
| PT_400021 GU_400591 28 28 28 PT_400021 GU_400591 28 28 28 PT_400021 GU_400591 28 28 28 PT_400021 GU_400900 28 28 28 PT_400021 GU_400910 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401640 28 28 28 PT_400021 GU_401640 28 28 28 PT_400021 GU_401640 28 28 28 PT_400023 GU_400130 28 28 28 PT_400030 GU_400310 28 28 28 PT_400030 GU_400310 28 28 28 PT_400033 GU_400310 30 28 28 PT_400033 GU_400310 30 30 30 30 30 30 30 | | _ | | | |
| PT_400021 GU_400501 28 28 28 PT_400021 GU_400600 28 28 28 PT_400021 GU_400910 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401600 28 28 28 PT_400021 GU_401600 28 28 28 PT_400021 GU_401640 28 28 28 PT_400025 GU_400130 28 28 28 PT_400030 GU_400310 28 28 28 PT_400030 GU_400310 28 28 28 PT_400033 GU_400430 22 2 2 2 2 2 2 2 2 | | _ | | | |
| PT_400021 GU_400600 28 28 PT_400021 GU_400910 28 28 PT_400021 GU_400920 28 28 PT_400021 GU_401080 28 28 PT_400021 GU_401600 28 28 PT_400021 GU_401640 28 28 PT_400025 GU_400130 28 28 PT_400030 GU_400310 28 28 PT_400032 GU_400430 2 2 PT_400033 GU_400430 2 2 PT_400034 GU_400550 28 28 PT_400038 GU_400650 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_40060 28 28 PT_400050 GU_401060 28 28 PT_400050 GU_401060 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401240 28 28 | | | | | |
| PT_400021 GU_400910 28 28 28 PT_400021 GU_400920 28 28 28 PT_400021 GU_400180 28 28 28 PT_400021 GU_401380 28 28 28 PT_400021 GU_401600 28 28 28 PT_400025 GU_400130 28 28 PT_400030 GU_400310 28 28 PT_400032 GU_400430 2 2 2 PT_400034 GU_400500 1 1 1 PT_400038 GU_400550 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_401600 GU_40150 GU_40150 GU_401600 GU_401200 GU_401600 GU_401200 GU_401260 GU_400660 GU_401260 GU_400660 GU_401260 GU_400660 GU_401260 GU_400660 GU_401260 GU_400660 GU_401260 GU_400660 GU_4 | | _ | | | |
| PT_400021 GU_401080 28 28 28 PT_400021 GU_401080 28 28 28 PT_400021 GU_401600 28 28 28 PT_400021 GU_401600 28 28 28 PT_400021 GU_401640 28 28 28 PT_400025 GU_400130 28 28 PT_400030 GU_400310 28 28 PT_400030 GU_400310 28 28 PT_400032 GU_400430 2 2 2 2 PT_400034 GU_400550 28 28 PT_400038 GU_400550 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_401060 28 28 PT_400050 GU_401060 28 28 PT_400050 GU_401060 28 28 28 PT_400050 GU_40160 GU_40150 GU_40150 GU_40150 GU_40150 GU_40150 GU_40150 GU_40150 GU_401250 GU_401250 GU_401250 GU_401250 GU_40160 GU_40060 GU_40060 GU_40160 GU_40060 GU | | | | | |
| PT_400021 GU_401080 28 28 PT_400021 GU_401380 28 28 PT_400021 GU_401600 28 28 PT_400025 GU_401640 28 28 PT_400035 GU_400130 28 28 PT_400032 GU_400430 2 2 2 PT_400034 GU_401990 1 1 1 PT_400036 GU_400550 28 28 PT_400050 GU_400650 28 28 PT_400050 GU_400660 28 28 PT_400050 GU_401000 28 28 PT_400050 GU_401600 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401360 28 | | | | | |
| PT_400021 GU_401380 28 28 PT_400021 GU_401600 28 28 PT_400025 GU_400130 28 28 PT_400030 GU_400310 28 28 PT_400032 GU_400430 2 2 2 PT_400034 GU_401990 1 2 2 2 2 2 2 2 | | | | | |
| PT_400021 GU_401640 28 28 PT_400021 GU_4001404 28 28 PT_400025 GU_400310 28 28 PT_400030 GU_400310 28 28 PT_400032 GU_400430 2 2 2 PT_400038 GU_400650 28 28 28 PT_400050 GU_400660 28 28 28 PT_400050 GU_400660 28 28 28 PT_400050 GU_401000 28 28 28 PT_400050 GU_40160 28 28 28 PT_400050 GU_40160 28 28 28 PT_400050 GU_40160 28 28 28 PT_400050 GU_401240 28 28 28 PT_400050 GU_401250 28 28 28 PT_400050 GU_401250 28 28 28 PT_400050 GU_401290 28 28 28 | | _ | | | |
| PT_400021 GU_401640 28 28 PT_400025 GU_400130 28 28 PT_400032 GU_400430 2 2 2 PT_400034 GU_401090 1 1 1 PT_400036 GU_400550 28 28 28 PT_400050 GU_400660 28 28 28 PT_400050 GU_401660 28 28 28 PT_400050 GU_401600 28 28 28 PT_400050 GU_401000 28 28 28 PT_400050 GU_401060 28 28 28 PT_400050 GU_401240 28 28 28 PT_400050 GU_401240 28 28 28 PT_400050 GU_401250 28 28 28 PT_400050 GU_401260 28 28 28 PT_400050 GU_401290 28 28 28 PT_400050 GU_400630 1 1 | | | | | |
| PT_400025 GU_400130 28 28 28 PT_400030 GU_400310 28 28 28 PT_400032 GU_400430 2 2 2 2 2 2 2 2 2 | | | | | |
| PT_400030 GU_400310 28 28 28 PT_400032 GU_400430 2 2 2 2 2 PT_400034 GU_401090 1 1 1 1 1 1 1 1 1 | _ | | | | |
| PT_400032 GU_400430 2 2 2 PT_400034 GU_401090 1 1 1 1 1 1 1 1 1 | | | | | |
| PT_400034 GU_401090 | | _ | | | |
| PT_400038 GU_400550 28 28 28 PT_400050 GU_400650 28 28 28 PT_400050 GU_400660 28 28 28 PT_400050 GU_401000 28 28 28 PT_400050 GU_401060 28 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400050 GU_401360 28 28 PT_400050 GU_401360 28 28 PT_400050 GU_401360 28 28 PT_400055 GU_400630 1 1 1 1 1 1 1 1 1 | | | | | |
| PT_400050 GU_400650 28 28 28 PT_400050 GU_401060 28 28 28 PT_400050 GU_401060 28 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400050 GU_401290 28 28 28 PT_400055 GU_400630 1 1 1 PT_400055 GU_400630 1 1 1 PT_400062 GU_400731 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400731 28 28 PT_400062 GU_400730 28 28 28 PT_400062 GU_400730 28 28 PT_400062 GU_400730 28 28 PT_400062 GU_400730 28 28 PT_400062 GU_400770 GU_400950 1 1 1 PT_400062 GU_401100 28 28 28 PT_400067 GU_401230 20 20 20 PT_400151 GU_401770 28 28 28 PT_400152 GU_401770 28 28 28 PT_400152 GU_401700 28 28 28 PT_400152 GU_401700 28 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_5001160 28 28 PT_500021 GU_500110 28 28 PT_500021 GU_500110 28 28 PT_500021 GU_500110 28 28 PT_500032 GU_500210 28 28 PT_500032 GU_500210 28 28 PT_500044 GU_500720 28 28 PT_500046 GU_500720 28 28 PT_500046 GU_500740 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 2 ET_500050 GU_501050 2 2 2 ET_5000 | | | | | |
| PT_400050 GU_400660 28 28 PT_400050 GU_401000 28 28 PT_400050 GU_401160 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400050 GU_401360 28 28 PT_400050 GU_401360 28 28 PT_400050 GU_400630 1 1 1 PT_400062 GU_400731 28 28 PT_400062 GU_400731 28 28 PT_400062 GU_400840 28 28 PT_400062 GU_400840 28 28 PT_400062 GU_400840 28 28 PT_400087 GU_40190 28 28 PT_400087 GU_401700 28 28 PT_400151 GU_401770 28 28 | | | | | |
| PT_400050 | | _ | | | |
| PT_400050 GU_401060 28 28 PT_400050 GU_401150 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400050 GU_401360 28 28 PT_400055 GU_400630 1 1 1 PT_400062 GU_400730 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400840 28 28 28 PT_400077 GU_400950 1 1 1 PT_400077 GU_400950 1 1 1 PT_400082 GU_401100 28 28 28 PT_400087 GU_401230 20 20 20 PT_400151 GU_401770 28 28 28 PT_400152 GU_401700 28 28 28 PT_400152 < | | | | | |
| PT_400050 GU_401150 28 28 PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400055 GU_401360 28 28 PT_400062 GU_400630 1 1 1 PT_400062 GU_400731 28 28 PT_400062 GU_400840 28 28 PT_400062 GU_400840 28 28 PT_400077 GU_400950 1 1 1 PT_400082 GU_401230 20 20 20 PT_400087 GU_401230 20 20 20 PT_400151 GU_401770 28 28 28 PT_400152 GU_401700 28 28 28 PT_400152 GU_401720 28 28 28 PT_400152 GU_401740 28 28 28 PT_400152 GU_401760 28 | | _ | | | |
| PT_400050 GU_401240 28 28 PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400055 GU_401360 28 28 PT_400065 GU_400630 1 1 1 PT_400062 GU_400730 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400840 28 28 28 PT_400062 GU_400950 1 2 2 2 2 2 2 2 2 | | | | | |
| PT_400050 GU_401250 28 28 PT_400050 GU_401290 28 28 PT_400050 GU_401360 28 28 PT_400055 GU_400630 1 1 1 PT_400062 GU_400730 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400840 28 28 28 PT_400077 GU_400950 1 2 8 28 28 28 28 28 28 28 28 | | _ | | | |
| PT_400050 GU_401290 28 28 PT_400050 GU_401360 28 28 PT_400055 GU_400630 1 1 1 PT_400062 GU_400730 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400840 28 28 28 PT_400077 GU_400950 1 2 8 28 8 8 < | | _ | | | |
| PT_400050 GU_401360 28 28 PT_400055 GU_400630 1 1 PT_400062 GU_400730 28 28 PT_400062 GU_400731 28 28 PT_400062 GU_400840 28 28 PT_400077 GU_400950 1 1 1 PT_400082 GU_401100 28 28 PT_400087 GU_401230 20 20 PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500160 28 28 PT_500032 GU_5001120 28 28 | | _ | | | |
| PT_400055 GU_400630 1 1 1 PT_400062 GU_400730 28 28 28 PT_400062 GU_400731 28 28 28 PT_400062 GU_400840 28 28 28 PT_400077 GU_400950 1 2 8 28 28 | | _ | | | |
| PT_400062 GU_400730 28 28 PT_400062 GU_400731 28 28 PT_400062 GU_400840 28 28 PT_400077 GU_400950 1 1 PT_400082 GU_401100 28 28 PT_400087 GU_401230 20 20 PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500040 28 28 PT_500032 GU_500740 28 28 PT_500032 GU_500160 28 28 PT_500032 GU_500211 28 28 PT_500044 GU_500720 28 28 PT_500048 < | | | | | |
| PT_400062 GU_400731 28 28 PT_400062 GU_400840 28 28 PT_400077 GU_400950 1 1 PT_400082 GU_401100 28 28 PT_400151 GU_401230 20 20 PT_400152 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500032 GU_501160 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_50070 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 PT_500050 | | | | | |
| PT_400062 GU_400840 28 28 PT_400077 GU_400950 1 1 PT_400082 GU_401100 28 28 PT_400087 GU_401230 20 20 PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500039 GU_50070 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_5000050 G | | | | | |
| PT_400077 GU_400950 1 1 PT_400082 GU_401100 28 28 PT_400151 GU_401230 20 20 PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500032 GU_501160 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_50070 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 1 PT_500050 GU_501040 1 1 1 | | | | | |
| PT_400087 GU_401230 20 20 PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500032 GU_501160 28 28 PT_500032 GU_501120 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 1 PT_500050 GU_501040 1 1 1 PT_500050 GU_501050 2 2 | PT 400077 | GU 400950 | | 1 | |
| PT_400151 GU_401770 28 28 PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_501120 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 1 PT_500050 GU_501040 1 1 1 PT_500050 GU_501050 2 2 | PT_400082 | GU_401100 | | 28 | 28 |
| PT_400152 GU_401710 28 28 PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 1 PT_500050 GU_501040 1 1 1 PT_500050 GU_501050 2 2 | PT_400087 | GU_401230 | | 20 | 20 |
| PT_400152 GU_401720 28 28 PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_50120 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 1 PT_500050 GU_501040 1 1 1 PT_500050 GU_501050 2 2 2 | PT_400151 | GU_401770 | | 28 | 28 |
| PT_400152 GU_401730 28 28 PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401710 | | 28 | 28 |
| PT_400152 GU_401740 28 28 PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401720 | | 28 | 28 |
| PT_400152 GU_401750 28 28 PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401730 | | 28 | 28 |
| PT_400152 GU_401760 28 28 PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401740 | | 28 | 28 |
| PT_500021 GU_500010 28 28 PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401750 | | 28 | 28 |
| PT_500021 GU_500740 28 28 PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_400152 | GU_401760 | | 28 | 28 |
| PT_500021 GU_501160 28 28 PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500021 | GU_500010 | | 28 | 28 |
| PT_500032 GU_500211 28 28 PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500021 | GU_500740 | | 28 | 28 |
| PT_500032 GU_501120 28 28 PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500021 | GU_501160 | | 28 | 28 |
| PT_500039 GU_500270 28 28 PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500032 | GU_500211 | | 28 | 28 |
| PT_500044 GU_500720 28 28 PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500032 | GU_501120 | | 28 | 28 |
| PT_500047 GU_500790 28 28 PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500039 | GU_500270 | | 28 | 28 |
| PT_500048 GU_500904 1 1 PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500044 | GU_500720 | | 28 | 28 |
| PT_500050 GU_501040 1 1 PT_500050 GU_501050 2 2 | PT_500047 | GU_500790 | | 28 | 28 |
| PT_500050 GU_501050 2 2 | PT_500048 | GU_500904 | | 1 | 1 |
| | PT_500050 | GU_501040 | | 1 | 1 |
| PT_500050 GU_501150 1 1 | PT_500050 | | | 2 | 2 |
| | PT_500050 | GU_501150 | | 1 | 1 |

| | Percentage | 74.26% | 0.16% | 25.58% | 100.00% |
|-----------|------------|--------|-------|--------|---------|
| | Total | 4090 | 9 | 1409 | 5508 |
| PT_400030 | I_ROIEWIC | 28 | | | 28 |
| PT_400099 | I_ROIEWIC | 28 | | | 28 |
| PT_500070 | I_NIMOYLE | 64 | | | 64 |
| PT_400108 | I_ROIEWIC | 63 | | | 63 |
| PT_400136 | I_ROIEWIC | 62 | | | 62 |
| PT_400115 | I_ROIEWIC | 30 | | | 30 |
| PT_500037 | I_NIMOYLE | 28 | | | 28 |
| PT_400096 | I_ROIEWIC | 84 | | | 84 |
| PT_400113 | I_ROIEWIC | 26 | | | 26 |
| PT_500031 | I_NIMOYLE | 30 | | | 30 |
| PT_500058 | I_NIMOYLE | 26 | | | 26 |
| PT_500069 | I_NIMOYLE | 84 | | | 84 |
| PT_500024 | I_NIMOYLE | 41 | | | 41 |
| PT_500075 | I_NIMOYLE | 80 | | | 80 |
| PT_500021 | I_NIMOYLE | 28 | | | 28 |
| PT_400021 | I_ROIEWIC | 28 | | | 28 |
| PT_500074 | GU_501250 | | | 28 | 28 |
| PT_500073 | GU_501230 | | | 28 | 28 |
| PT_500066 | GU_501210 | | | 1 | 1 |
| PT_500062 | GU_501180 | | | 28 | 28 |
| PT_500061 | GU_501170 | | | 28 | 28 |
| PT_500050 | GU_501190 | | | 1 | 1 |

Table 31 – Default Commercial Data Used

14 Appendix G: Total Charges and Payments Data

The tables below list historical values for Total Charges and Total Payments in the SEM by month and currency since start of the SEM.

- Month of inclusion based on invoice date.
- Amounts are after application of Settlement Reallocation.

| Market | | Energy | Capacity | Market Operator | M+4 Energy | M+4 Capacity | M+4 Market Operator | M+13 Energy | M+13 Capacity | M+13 Market Operator | Ad-hoc Energy | Ad-hoc Capacity | Ad-hoc Market Operator | Total |
|----------|-----|-----------------|------------------|-----------------|---------------|--------------|------------------------|---------------|---------------|-------------------------|---------------|-----------------|---------------------------|----------------|
| Nov-13 | ROI | £94,237,410.27 | £26,111,830.04 | £1,768,924.89 | £1,095,479.88 | £186,255.41 | £10,667.03 | £1,203,541.15 | £58,436.00 | £1,881.53 | £2,162,845.35 | £0.00 | £0.00 | 126,837,271.55 |
| 1404-13 | NI | £40,120,956.32 | £9,383,627.04 | £512,345.05 | £79,171.25 | £13,455.28 | £753.82 | £304,333.70 | £18,778.73 | £614.32 | £591,913.98 | £0.00 | £0.00 | 51,025,949.49 |
| Dec-13 | ROI | £59,731,699.86 | £27,864,400.43 | £1,135,385.04 | £777,997.00 | £175,711.33 | £8,515.85 | £874,795.89 | £44,746.05 | £1,825.43 | £0.00 | £0.00 | £0.00 | 90,615,076.88 |
| Dec 13 | NI | £26,108,999.75 | £9,220,782.35 | £325,646.22 | £58,193.58 | £77,917.35 | £571.58 | £137,253.25 | £14,599.87 | £487.47 | £0.00 | £0.00 | £0.00 | 35,944,451.42 |
| Jan-14 | ROI | £114,421,340.65 | £24,793,160.86 | £2,129,762.27 | £798,055.27 | £127,352.61 | £7,984.34 | £204,139.96 | £36,418.59 | £1,561.86 | £473,584.35 | £0.00 | £0.00 | 142,993,360.76 |
| Juli 21 | NI | £51,824,850.54 | £9,142,377.84 | £617,870.56 | £62,006.75 | £10,003.11 | £595.49 | £67,335.86 | £14,491.45 | £574.85 | £141,821.26 | £0.00 | £0.00 | 61,881,927.71 |
| Feb-14 | ROI | £66,102,607.16 | £27,393,747.26 | £1,496,376.58 | £305,733.65 | £76,911.71 | £2,819.89 | £479,013.35 | £22,451.87 | £9,128.65 | £381,194.91 | £0.00 | £0.00 | 96,269,985.03 |
| 100 14 | NI | £31,130,342.59 | £9,846,758.26 | £422,869.99 | £25,720.60 | £3,900.39 | £240.37 | £187,918.65 | £15,303.03 | £942.92 | £235.51 | £0.00 | £0.00 | 41,634,232.31 |
| Mar-14 | ROI | £70,041,213.49 | £26,285,336.21 | £1,449,159.95 | £261,906.17 | £61,216.38 | £2,226.19 | £92,283.95 | £30,407.22 | £960.16 | £0.00 | £0.00 | £0.00 | 98,224,709.72 |
| | NI | £30,175,818.70 | £9,293,564.48 | £406,620.40 | £46,940.79 | £7,639.04 | £408.77 | £52,408.32 | £11,933.67 | £470.83 | £0.00 | £0.00 | £0.00 | 39,995,805.00 |
| Apr-14 | ROI | £62,098,778.40 | £21,155,742.39 | £1,388,175.41 | £528,104.58 | £142,466.39 | £4,901.73 | £242,053.48 | £38,030.86 | £1,783.00 | £0.00 | £0.00 | £0.00 | 85,600,036.24 |
| 7-p1 1-1 | NI | £26,448,426.91 | £9,644,850.74 | £386,840.18 | £307,948.88 | £77,962.26 | £2,649.15 | £53,805.05 | £9,613.13 | £381.03 | £0.00 | £0.00 | £0.00 | 36,932,477.33 |
| May-14 | ROI | £68,945,192.38 | £22,029,381.87 | £1,615,436.17 | £629,905.18 | £213,410.99 | £7,659.07 | £192,421.65 | £21,030.53 | £1,110.05 | £429,407.30 | £0.00 | £0.00 | 94,084,955.19 |
| may 14 | NI | £28,649,957.73 | £7,313,397.03 | £439,831.96 | £149,812.37 | £34,908.87 | £997.82 | £58,386.93 | £9,959.93 | £468.77 | £0.03 | £0.00 | £0.00 | 36,657,721.44 |
| Jun-14 | ROI | £52,841,750.77 | £17,596,854.80 | £1,312,068.35 | £423,771.26 | £115,750.72 | £4,162.65 | £89,169.46 | £18,685.28 | £1,014.73 | £28,526.30 | £0.00 | £0.00 | 72,431,754.32 |
| Juli 14 | NI | £21,944,762.06 | £6,361,219.34 | £345,120.63 | £120,971.43 | £44,784.33 | £1,003.03 | £41,125.48 | £9,461.42 | £415.67 | £2,532.18 | £0.00 | £0.00 | 28,871,395.57 |
| Jul-14 | ROI | £48,255,770.91 | £22,988,780.17 | £1,292,701.68 | £332,606.61 | £88,357.34 | £2,943.28 | £85,242.72 | £17,526.18 | £1,047.39 | £0.00 | £0.00 | £0.00 | 73,064,976.28 |
| 7di 14 | NI | £16,832,807.07 | £5,122,118.14 | £325,108.62 | £91,338.63 | £25,719.39 | £870.76 | £34,166.04 | £7,520.83 | £436.14 | £0.00 | £0.00 | £0.00 | 22,440,085.62 |
| Aug-14 | ROI | £65,650,453.03 | £55,349,682.44 | £856,456.83 | £281,934.15 | £56,929.88 | £1,558.86 | £451,006.63 | £29,817.73 | £839.90 | £68,857.79 | £0.00 | £0.00 | 122,747,537.24 |
| | NI | £25,773,047.64 | £16,395,217.13 | £213,118.58 | £112,874.22 | £37,025.56 | £783.98 | £25,242.43 | £5,150.11 | £140.40 | £0.00 | £0.00 | £0.00 | 42,562,600.05 |
| Sep-14 | ROI | £73,166,499.86 | £17,774,079.00 | £1,638,145.68 | £285,506.09 | £62,431.70 | £3,367.28 | £92,320.83 | £30,020.38 | £728.19 | £0.00 | £0.00 | £0.00 | 93,053,099.01 |
| 3CP 14 | NI | £24,828,028.32 | £5, 414, 449. 74 | £421,681.34 | £62,719.19 | £15,276.27 | £566.66 | £41,391.12 | £13,194.54 | £660.78 | £0.00 | £0.00 | £0.00 | 30,797,967.96 |
| Oct-14 | ROI | £24,219,443.57 | £5,293,829.01 | £290,759.61 | £125,095.27 | £15,188.14 | £796.75 | £32,076.91 | £6,465.54 | £355.27 | £0.00 | £0.00 | £0.00 | 29,984,010.07 |
| 000 14 | NI | £73,931,567.89 | £18,999,271.36 | £1,111,306.76 | £521,095.61 | £105,483.15 | £5,765.50 | £89,815.40 | £9,518.03 | £802.55 | £0.00 | £0.00 | £0.00 | 94,774,626.25 |
| Nov-14 | ROI | £57,386,075.03 | £21,066,561.05 | £829,482.91 | £519,431.32 | £147,151.65 | £6,123.28 | £79,434.93 | £23,622.83 | £721.00 | £0.00 | £0.00 | £0.00 | 80,058,604.00 |
| 1107 27 | NI | £21,159,632.98 | £6,853,966.46 | £220,983.06 | £50,691.24 | £27,250.12 | £653.21 | £26,795.35 | £6,589.23 | £253.47 | £0.00 | £0.00 | £0.00 | 28,346,815.12 |
| Dec-14 | ROI | £70,930,088.87 | £29,867,271.70 | £888,221.25 | £635,976.36 | £143,088.63 | £7,086.94 | £116,364.21 | £26,279.71 | £995.87 | £0.00 | £0.00 | £0.00 | 102,615,373.54 |
| Dec 14 | NI | £24,123,259.48 | £7,725,422.06 | £238,369.94 | £58,794.95 | £14,543.55 | £696.33 | £34,690.50 | £7,234.36 | £296.35 | £0.00 | £0.00 | £0.00 | 32,203,307.52 |
| Jan-15 | ROI | £66,217,285.22 | £32,948,586.09 | £1,048,029.61 | £438,657.65 | £106,047.92 | £3,853.63 | £150,902.14 | £27,588.16 | £819.15 | £0.00 | £2,703.81 | £0.00 | 100,944,473.38 |
| Juli 13 | NI | £27,989,159.87 | £8,572,662.67 | £280,425.53 | £42,989.83 | £9,581.57 | £365.00 | £37,526.70 | £7,104.61 | £229.56 | £0.00 | £1,338.36 | £0.00 | 36,941,383.70 |
| Feb-15 | ROI | £65,650,453.03 | £55,349,682.44 | £856,456.83 | £281,934.15 | £56,929.88 | £1,558.86 | £451,006.63 | £29,817.73 | £839.90 | £68,857.79 | £0.00 | £0.00 | 122,747,537.24 |
| 160-13 | NI | £25,773,047.64 | £16,395,217.13 | £213,118.58 | £112,874.22 | £37,025.56 | £783.98 | £25,242.43 | £5,150.11 | £140.40 | £0.00 | £0.00 | £0.00 | 42,562,600.05 |

Table 32 - Total Charges by Month

| Mark | ket | Energy | Capacity | M+4 Energy | M+4 Capacity | M+4 Market Operator | M+13 Energy | M+13 Capacity | M+13 Market Operator | Ad-hoc Energy | Ad-hoc Capacity | Ad-hoc Market Operator | Total |
|----------|-----|-----------------|----------------|---------------|--------------|------------------------|---------------|---------------|-------------------------|---------------|-----------------|---------------------------|-----------------|
| Nov-13 | ROI | €101,727,467.69 | €26,117,243.83 | €1,224,763.25 | €189,998.42 | €12,263.50 | €1,215,831.35 | €57,206.41 | €1,470.22 | €2,187,635.43 | €0.00 | €0.00 | €132,733,880.10 |
| 1404-73 | NI | €38,593,632.08 | €9,396,822.98 | €111,667.01 | €10,330.33 | €754.66 | €405,512.07 | €19,818.44 | €503.29 | €523,998.04 | €0.00 | €0.00 | €49,063,038.90 |
| Dec-13 | ROI | €65,016,104.57 | €28,265,983.93 | €814,481.63 | €237,772.30 | €8,560.54 | €742,019.49 | €45,101.88 | €1,753.62 | €0.00 | €0.00 | €0.00 | €95,131,777.96 |
| Dec-13 | NI | €26,883,033.60 | €8,854,167.97 | €62,225.77 | €25,458.47 | €563.46 | €254,389.50 | €14,183.48 | €467.80 | €0.00 | €0.00 | €0.00 | €36,094,490.05 |
| Jan-14 | ROI | €134,009,133.84 | €23,642,517.67 | €793,440.19 | €126,432.23 | €7,824.65 | €221,578.57 | €36,894.00 | €1,646.36 | €479,971.01 | €0.00 | €0.00 | €159,319,438.52 |
| Juli 14 | NI | €51,714,479.92 | €10,157,332.65 | €82,843.03 | €10,154.76 | €543.56 | €66,035.81 | €14,046.97 | €605.11 | €109,684.36 | €0.00 | €0.00 | €62,155,726.17 |
| Feb-14 | ROI | €78,679,881.12 | €26,819,095.36 | €304,687.52 | €76,805.50 | €2,536.46 | €531,739.65 | €29,343.21 | €10,349.43 | €443,421.38 | €0.00 | €0.00 | €106,897,859.63 |
| 160-14 | NI | €29,747,186.53 | €10,347,544.45 | €37,918.21 | €4,082.15 | €214.26 | €179,315.25 | €9,737.45 | €350.80 | €3.55 | €0.00 | €0.00 | €40,326,352.65 |
| Mar-14 | ROI | €75,149,006.14 | €26,180,620.54 | €259,644.98 | €60,397.08 | €2,170.67 | €127,303.70 | €28,200.28 | €960.40 | €0.00 | €0.00 | €0.00 | €101,808,303.79 |
| IVIGI-14 | NI | €29,749,446.42 | €9,292,032.85 | €46,950.40 | €8,326.93 | €408.65 | €52,017.29 | €13,760.80 | €471.08 | €0.00 | €0.00 | €0.00 | €39,163,414.42 |
| Apr-14 | ROI | €65,482,679.64 | €21,981,963.17 | €549,302.08 | €147,627.43 | €4,399.40 | €259,726.57 | €38,566.49 | €1,783.33 | €0.00 | €0.00 | €0.00 | €88,466,048.11 |
| Apr-14 | NI | €25,517,456.45 | €8,979,409.88 | €303,950.50 | €73,719.22 | €2,138.60 | €56,294.66 | €9,188.57 | €381.08 | €0.00 | €0.00 | €0.00 | €34,942,538.96 |
| May-14 | ROI | €68,502,489.93 | €22,405,052.21 | €652,683.44 | €210,307.65 | €7,807.32 | €249,029.58 | €16,425.79 | €1,110.17 | €9,581.32 | €0.00 | €0.00 | €92,054,487.41 |
| May-14 | NI | €27,515,054.00 | €7,036,489.15 | €150,145.26 | €37,452.65 | €999.79 | €81,713.52 | €13,718.04 | €468.77 | €3.89 | €0.00 | €0.00 | €34,836,045.07 |
| Jun-14 | ROI | €53,863,542.49 | €16,268,861.66 | €424,333.36 | €121,415.36 | €4,245.54 | €106,227.35 | €17,318.53 | €1,014.63 | €10,805.33 | €0.00 | €0.00 | €70,817,764.25 |
| Juli-14 | NI | €18,301,490.12 | €7,464,864.99 | €121,134.45 | €40,186.30 | €1,005.32 | €50,770.87 | €10,564.39 | €415.66 | €29.76 | €0.00 | €0.00 | €25,990,461.86 |
| Jul-14 | ROI | €50,929,138.15 | €21,772,067.06 | €326,631.36 | €82,858.43 | €2,938.18 | €123,130.56 | €17,118.42 | €1,016.51 | €0.00 | €0.00 | €0.00 | €73,254,898.67 |
| Jui-14 | NI | €12,936,147.70 | €6,035,816.09 | €91,479.13 | €29,875.87 | €813.16 | €67,310.27 | €7,807.37 | €427.29 | €0.00 | €0.00 | €0.00 | €19,169,676.88 |
| Aug-14 | ROI | €76,295,371.52 | €16,503,906.00 | €283,973.76 | €42,797.07 | €2,738.01 | €125,676.42 | €0.00 | €1,327.83 | €29.36 | €0.00 | €0.00 | €93,255,819.97 |
| Aug-14 | NI | €19,828,437.97 | €15,954,828.70 | €108,022.71 | €28,545.69 | €367.07 | €16,957.65 | €4,432.19 | €141.23 | €0.00 | €0.00 | €0.00 | €35,941,733.21 |
| Sep-14 | ROI | €73,630,247.02 | €17,405,067.16 | €261,367.00 | €62,924.88 | €3,377.33 | €73,033.72 | €11,845.94 | €728.13 | €0.00 | €0.00 | €0.00 | €91,448,591.18 |
| 3ep-14 | NI | €22,272,153.08 | €5,742,482.51 | €49,069.86 | €14,962.35 | €717.66 | €41,404.59 | €13,672.05 | €509.28 | €0.00 | €0.00 | €0.00 | €28,134,971.38 |
| Oct-14 | ROI | €19,828,437.97 | €15,954,828.70 | €108,022.71 | €28,545.69 | €367.07 | €16,957.65 | €4,432.19 | €141.23 | €0.00 | €0.00 | €0.00 | €35,941,733.21 |
| Ott-14 | NI | €18,391,944.98 | €5,868,972.09 | €82,257.95 | €15,709.16 | €1,031.70 | €42,677.16 | €6,422.11 | €498.29 | €0.00 | €0,00 | €0.00 | €24,409,513.44 |
| Nov-14 | ROI | €64,818,088.97 | €20,480,936.98 | €530,386.99 | €157,754.12 | €6,116.91 | €78,674.36 | €23,606.67 | €1,289.81 | €0.00 | €0.00 | €0.00 | €86,096,854.81 |
| 1404-14 | NI | €14,616,605.70 | €7,312,194.38 | €50,960.79 | €18,897.71 | €653.20 | €37,498.77 | €6,592.72 | €254.29 | €0.00 | €0.00 | €0.00 | €22,043,657.56 |
| Dec-14 | ROI | €79,262,340.64 | €30,252,803.13 | €636,211.01 | €143,171.30 | €7,087.15 | €116,495.94 | €25,330.11 | €995.97 | €0.00 | €0.00 | €0.00 | €110,444,435.25 |
| Det-14 | NI | €17,625,339.05 | €7,511,303.13 | €58,743.90 | €14,475.87 | €679.17 | €34,724.44 | €7,982.34 | €296.61 | €0.00 | €0.00 | €0.00 | €25,253,544.51 |
| Jan-15 | ROI | €77,706,417.44 | €34,394,754.66 | €438,764.21 | €107,475.98 | €4,105.28 | €98,914.59 | €27,079.30 | €830.89 | €14,240.78 | €3,537.75 | €0.00 | €112,796,120.88 |
| Jan-13 | NI | €21,735,748.95 | €7,476,289.80 | €38,275.71 | €8,505.48 | €324.11 | €25,331.16 | €7,456.18 | €248.46 | €0.00 | €691.42 | €0.00 | €29,292,871.27 |
| Feb-15 | ROI | €73,470,092.53 | €55,924,536.86 | €296,450.78 | €68,641.91 | €1,587.00 | €108,844.27 | €30,840.66 | €843.06 | €0.00 | €0.00 | €0.00 | €129,901,837.07 |
| F60-12 | NI | €19,828,437.97 | €15,954,828.70 | €108,022.71 | €28,545.69 | €367.07 | €16,957.65 | €4,432.19 | €141.23 | €0.00 | €0.00 | €0.00 | €35,941,733.21 |

Table 33 - Total Payments by Month

15 Appendix H: Full Balancing Costs

Historical figures for full Balancing Costs of both the Trading and Capacity Markets, for the current financial year (October to September), are provided below. Information related to periods before this is available in previous Monthly Market Operator Reports.

- Positive values indicate Payments were greater than Charges.
- Negative values indicate Charges were greater than Payments.

Trading Market

| Date Of Invoice | Week No | SEM Balancing Costs | VAT Balancing Costs |
|--------------------|---------|---------------------|---------------------|
| 03/10/2014 | 38 | -€115,563.34 | -€ 12,716.83 |
| 10/10/2014 | 39 | €103,327.94 | €49,084.94 |
| 17/10/2014 | 40 | -€315,014.02 | -€ 48,688.42 |
| 24/10/2014 | 41 | €234,738.53 | €13,856.57 |
| 31/10/2014 | 42 | €833,278.35 | -€228,026.23 |
| 07/11/2014 | 43 | €1,209,277.49 | €172,019.41 |
| 14/11/2014 | 44 | -€89,236.37 | -€18,016.46 |
| 21/11/2014 | 45 | -€726,843.59 | -€105,801.85 |
| 28/11/2014 | 46 | -€504,700.82 | -€60,211.13 |
| 05/12/2014 | 47 | -€783,945.26 | -€105,665.85 |
| 12/12/2014 | 48 | -€481,481.35 | -€72,270.22 |
| 19/12/2014 | 49 | €485,102.80 | €53,433.64 |
| 31/12/2014 | 50 | €980,523.50 | € 148,117.94 |
| 06/01/2015 | 51 | €1,093,199.99 | -€115,434.63 |
| 09/01/2015 | 52 | €1,320,639.28 | -€ 84,567.47 |
| 16/01/2015 | 1 | €1,142,575.16 | -€178,714.26 |
| 23/01/2015 | 2 | €496,291.68 | -€87,488.46 |
| 30/01/2015 | 3 | -€871,479.91 | €86,389.82 |
| 06/02/2015 | 4 | €371,162.79 | -€86,251.15 |
| 13/02/2015 | 5 | -€198,874.86 | €21,560.90 |
| 20/02/2015 | 6 | -€341,073.88 | €60,600.73 |
| 27/02/2015 | 7 | €9,930.09 | -€86,398.49 |

Table 34 – Full Balancing Costs for Trading Charges and Payments

Note: SEM Balancing Costs are provided based on daily exchange rates; VAT Balancing Costs are based on the Invoicing Date Trading Day exchange rate. VAT Balancing costs exclude Currency Cost related VAT.

Capacity Market

| Invoice Month | SEM Balancing Costs | VAT Balancing Costs |
|---------------|---------------------|----------------------------|
| October 2014 | -€361.28 | -€ 968.24 |
| November 2014 | -€348.12 | -€0.03 |
| December 2014 | -€393.11 | €0.00 |
| January 2015 | -€416.65 | €0.04 |
| February 2015 | -€364.18 | €0.02 |

Table 35 - Balancing Costs for Capacity Settlement

Note: SEM Capacity Balancing Costs and VAT Balancing Costs are provided based on Annual Capacity exchange rate. VAT Balancing costs exclude Currency Cost related VAT.

16 Appendix I: MSP Algorithms

The Market Operator has two different certified solvers used to determine Unit Commitment. These solvers use the Lagrangian Relaxation (LR) and Mixed Integer Programming (MIP) methodologies.

The primary algorithm used in the SEM is Lagrangian Relaxation (LR). Under certain schedule outcomes this solution is compared to results achieved using MIP. The SEMO policy on the use of MIP has been updated and is available from the SEMO website <a href="https://example.com/her-semonth-semon

Historical information on runs and dates where the MIP algorithm has been used for published results is provided below.

| Month | Ex-Ante | Ex-Ante 2 | Ex-Post Indicative | Ex-Post Initial | Within Day |
|---------------|------------|--|--|--|--------------------------|
| October 2014 | 10/10/2014 | 03/10/2014 15/10/2014 28/10/2014 | 06/10/2014 13/10/2014 29/10/2014 | 06/10/2014 13/10/2014 27/10/2014 | <u>19/10/2014</u> |
| November 2014 | <u>-</u> | 02/11/2014 11/11/2014 15/11/2014 25/11/2014 | 20/11/2014 24/11/2014 26/11/2014 | 12/11/2014 20/11/2014 26/11/2014 | Ξ |
| December 2014 | 14/12/2014 | 04/12/2014 14/12/2014 25/12/2014 | 01/12/2014 | 04/12/2014 | -11 |
| January 2015 | 06/01/2015 | 12/01/2015 15/01/2015 21/01/2015 23/01/2015 | 03/01/2015 | 28/01/2015 | <u>16/01/2015</u> |
| February 2015 | <u>-</u> | 06/02/2015 07/02/2015 09/02/2015 13/02/2015 18/02/2015 23/02/2015 | 24/02/2015 | 28/02/2015 | 05/02/2015 10/02/2015 |

Table 36 - MIP Algorithms

| | | | | MIP Peak | |
|-------------------------|------------|----------|-------------|----------|-----------|
| Operational Date | Trade Date | Run Type | LR Peak SMP | SMP | Published |
| 02/10/2014 | 03/10/2014 | EA2 | €1000 | €298.79 | MIP |
| 07/10/2014 | 06/10/2014 | EP1 | €1000 | €287.16 | MIP |
| 10/10/2014 | 06/10/2014 | EP2 | €1000 | €288.65 | MIP |
| 09/10/2014 | 10/10/2014 | EA1 | €1000 | €338.11 | MIP |
| 14/10/2014 | 13/10/2014 | EP1 | €1000 | €141.67 | MIP |

| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
|---|---|
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP MIP MIP MIP MIP MIP MIP MIP MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP MIP MIP MIP MIP MIP MIP MIP |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | MIP MIP MIP MIP MIP MIP MIP |
| 21/11/2014 20/11/2014 EP1 €1000 €228.86 27/11/2014 26/11/2014 EP1 €1000 €380.87 25/11/2014 24/11/2014 EP1 €630.52 €560.63 16/11/2014 12/11/2014 EP2 €1000 €357.67 24/11/2014 20/11/2014 EP2 €1000 €228.14 | MIP MIP MIP MIP MIP |
| 27/11/2014 26/11/2014 EP1 €1000 €380.87 25/11/2014 24/11/2014 EP1 €630.52 €560.63 16/11/2014 12/11/2014 EP2 €1000 €357.67 24/11/2014 20/11/2014 EP2 €1000 €228.14 | MIP MIP MIP |
| 25/11/2014 24/11/2014 EP1 €630.52 €560.63 16/11/2014 12/11/2014 EP2 €1000 €357.67 24/11/2014 20/11/2014 EP2 €1000 €228.14 | MIP MIP MIP |
| 16/11/2014 12/11/2014 EP2 €1000 €357.67 24/11/2014 20/11/2014 EP2 €1000 €228.14 | MIP MIP |
| 24/11/2014 20/11/2014 EP2 €1000 €228.14 | MIP |
| | |
| 30/11/2014 26/11/2014 EP2 €1,000 €455.21 | |
| | MIP |
| 01/12/2014 30/11/2014 EP1 €554.66 €841.81 | MIP |
| 04/12/2014 05/12/2014 EA2 €1000 €271.08 | MIP |
| 04/12/2014 30/11/2014 EP2 €554.65 €439.23 | MIP |
| 14/12/2014 15/12/2014 EA1 €585.68 €241.97 | MIP |
| 14/12/2014 15/12/2014 EA2 €585.68 €242.87 | MIP |
| 25/12/2014 26/12/2014 EA2 €584.33 €71.42 | MIP |
| 03/01/2015 02/01/2015 EP1 €560.46 €244.25 | MIP |
| 06/01/2015 07/01/2015 EA1 €550.32 €230.74 | MIP |
| 12/01/2015 13/01/2015 EA2 €1000 €162.06 | MIP |
| 15/01/2015 16/01/2015 EA2 €1000 €210.05 | MIP |
| 16/01/2015 16/01/2015 WD1 €557.82 €176.01 | MIP |
| 21/01/2015 | MIP |
| 23/01/2015 24/01/2015 EA2 €1000 €361.30 | MIP |
| 28/01/2015 24/01/2015 EP2 €1000 €358.00 | MIP |
| 05/02/2015 05/02/2015 WD1 €583.65 €461.14 | MIP |
| 06/02/2015 07/02/2015 EA2 €1000 €201.17 | MIP |
| 07/02/2015 08/02/2015 EA2 €1000 €238.69 | MIP |
| 09/02/2015 10/02/2015 EA2 €1000 €211.44 | MIP |
| 10/02/2015 10/02/2015 WD1 €1000 €206.00 | MIP |
| 13/02/2015 14/02/2015 EA2 €1000 €920.77 | MIP |
| 18/02/2015 19/02/2015 EA2 €1000 €475.15 | MIP |
| 23/02/2015 24/02/2015 EA2 €1000 €239.26 | MIP |
| 24/02/2015 23/02/2015 EP1 €1000 €206.00 | MIP |
| 28/02/2015 24/02/2015 EP2 €1000 €418.22 | MIP |

Table 37 - MIP Vs LR Peak Price Comparison