Regulatory Authority Quarterly Report

Market Operator Performance Criteria

September 2016

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1   Introduction

The Single Electricity Market has been in operation since the 1st November 2007. Under the licence conditions of both EirGrid and SONI to operate the Single Electricity Market (SEM), SEMO has to report to the Regulatory Authorities (RAs) on critical performance metrics. These critical metrics were identified in a letter dated 18th October 2007 from the RAs to SEMO. The letter outlined four main categories of metric:

- Manage Change
- Service Delivery
- Manage Stakeholders
- Provide Information

Following the third quarterly meeting with the RAs, some of the metrics were revised under discussion with SEMO. This report has taken these comments on board in its preparation.

Quarters in this report are defined according to the financial year outlined below:

- Q1 = 1st October to 31st December

- Q2 = 1st January to 31st March

- Q3 = 1st April to 30th June

- Q4 = 1st July to 30th September

2   Manage Change

2.1   Software Deployments

2.1.1   Release SEM R2.8.0 (Deployed June 17th 2016)

SEM R 2.8.0 Release was deployed successfully on Friday 17th June. No issues have resulted following this deployment.

The following Change Requests were deployed as part of the SEM R 2.8.0

Change Request Reference	Summary	Business Case for Change
SEM_PC_CR351 (2014 Market Audit)	Eligible Availability Audit Change	During the 2014 Market Audit an observation relating to the optimisation of Eligible Generation Availability (and therefore Capacity Payments) for Energy Limited (EL) and Pumped Storage (PS) Units was identified. Due to incorrect prioritisation of Trading Periods where either Ex-Ante or Ex-Post Loss of Load Probability (LOLP) is zero the resulting assignment of availability for the affected units is sub-optimal. This is not a strict non-compliance with the algebraic formulation of the mechanism. It could, however, be considered contrary to the intent of the rules which is to optimise revenue in relation to generation availability. Where LOLP is zero this indicates a diminished need for generation availability so that Capacity revenues are lower in these periods. These Trading Periods should be considered lowest priority for the assignment of availability for affected EL/PS units. Due to a "divide by zero" in the maximised function, where LOLP is zero, the function cannot be evaluated. As a result these Trading Periods are in some cases given top priority for the assignment of availability where they should be given lowest priority. This change will correct this feature.
SEM_PC_CR354 (Revenue)	Irish Revenue – Electricity VAT Change	Revenue has introduced new rules as to how VAT is applied to supplies of wholesale electricity in the domestic ROI area. In summary, for domestic "business to business" supplies of electricity, the generator no longer apples VAT to supplies of electricity, rather the entity receiving the supply is liable to account for VAT. The new rules became effective on January 1st, 2016.

Table 1: Approved Scope for SEM R2.8.0 – Change Requests

2.1.2 Modification Management

SEMO Modifications Committee Report Period: 01 July 2016 to 30 September 2016	
Modification Committee Summary	**Total**
Number of Meetings held	1
• Modifications Committee Meeting 69 – 11th August	
Modification Proposal Activity in this period	
Standard Modification Proposals raised	0
Alternative Versions of Proposals raised	0
Urgent Modification Proposals raised	0
Modification Proposals 'Withdrawn'	0
New Modification Proposals 'Deferred' as of end of this period	0
Existing Modification Proposals 'Deferred' as of end of this period	3
Existing Modification Proposals 'Further Work Required' as of end of this period	0
Modification Proposals 'Recommended for Approval'	0
Modification Proposals 'Recommended for Rejection'	0
RA Determinations in this period	
RA Decision Papers 'Extension Granted'	0
RA Decision Papers 'Further Work Required'	0
RA Decision Papers 'Approved'	2
RA Decision Papers 'Rejected'	1
Summary of All Modifications to Date (30th June 2016)	
Total raised to date	352
Total 'Withdrawn' to date	51
Currently 'New or Deferred' in process (includes anything deemed "further work required")	3
Currently 'Recommended for Rejection'	3
Currently 'Recommended for Approval'	0
Currently 'Approved' (awaiting Implementation)	41
Total 'Implemented' to date	279
Total 'Rejected' to date	15

Details of all Modifications Proposals can be found at: http://www.sem-o.com/MarketDevelopment/Modifications/Pages/Modifications.aspx?Stage=Active
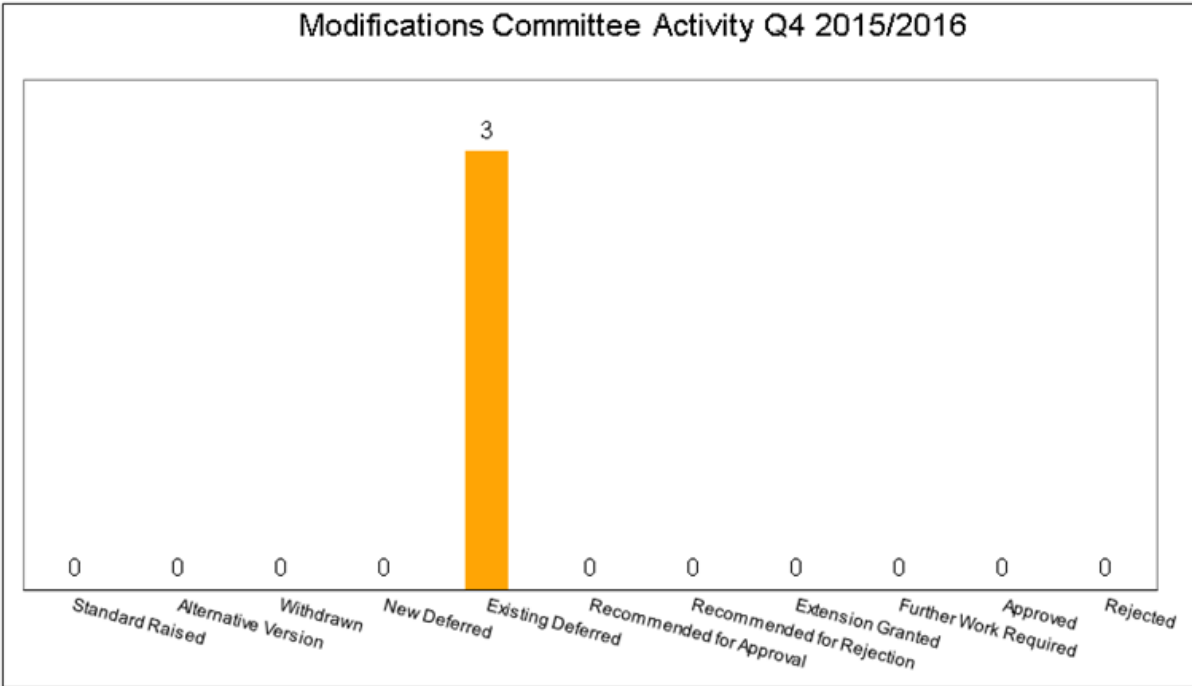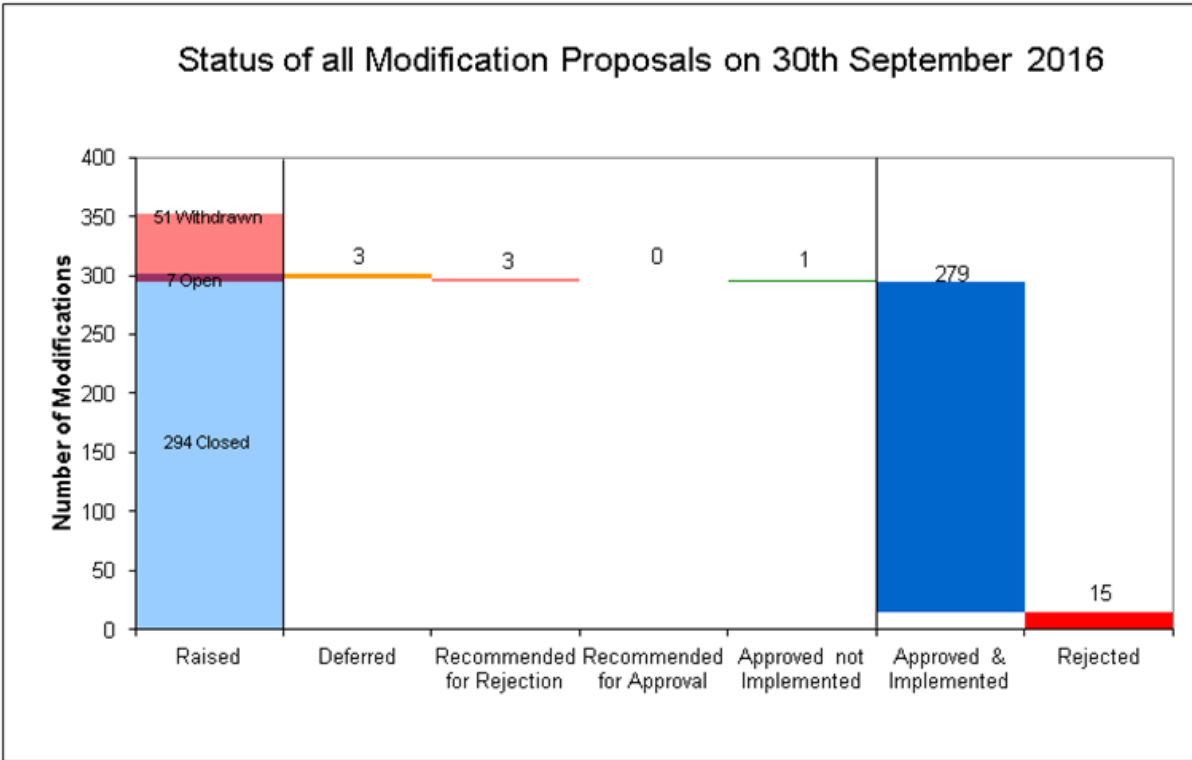
Figure 1: Modifications Summary Quarter 4 2016

Figure 2: Modifications Status to Date on 30th September 2016

2.2   Modifications Process Development

Modifications in Quarter 4 2015/2016

One Modifications Committee Meeting took place in Q4 of 2015/2016. Modifications Committee Meeting 69 took place on Thursday 11th August 2016.

Modifications Recommended for Approval

Mod_02_13 Registration of Charges

Regulatory Authorities issued a Final Decision letter approving this proposal with immediate effect as per the letter dated 8th September 2016.

Mod_09_15: AP07 Mod_08_14) Clarification of Location of SEM Collateral Reserve Accounts

Regulatory Authorities issued a Final Decision letter approving this proposal which will be effective within 6 months from the letter dated 8th September 2016. Final effective date will be agreed and communicated.

Deferred Modifications

Mod_04_15: Modification to Relevant Meter Operator Role and Support Requirements for Meter Communication Channels

The purpose of this modification will require the Relevant Meter Operator and Generator where it provided Meter Communication channels, to provide 2 day support arrangements (on a 7 day basis) for Meter Communication Channels and associated power supplies to energy metering systems. This is required for the provision of meter data to the SEM as per T&SC requirements under Appendix L "Meter data Transactions".

Engagement is also ongoing through various Metering Groups to address this issue. This proposal and progress on further engagement will be discussed again at Meeting 70 in October.

Mod_08_15: Clarification of Outturn Availability

On 29 September 2015, the SEMC published Decision Paper SEM-15-071 "Process for the Calculation of Outturn Availability". In this decision paper, the SEMC note that Outturn Availability is not adequately defined in the Trading and Settlement Code (and not defined in the Grid Code) and requires that the TSOs bring forward modifications commensurate with this decision paper.

Outturn Availability is the name assigned in SEM to the set of availability data for the relevant day received by the SEM systems from the TSO systems following the end of that day. This set of data is subsequently used to develop the availability profile of each Generator Unit in the SEM and consequently affects the commercial position of the generator. This modification to the TSC does not propose to change this meaning of Outturn Availability, but instead to clarify the definitions of Availability and Outturn Availability, referring to the Grid Code.

As the Grid Code does not currently refer to the term Outturn Availability, as the submission of data from the TSO systems to the SEM systems after the relevant day, is not within scope of the Grid Code. A modification to the Grid Code has also been developed by EirGrid and a consultation process is also being managed by SONI. This proposal will be discussed at Meeting 70.

Mod_08_16 : Proposal to end M+13 obligations under the TSC following the completion of M+4 resettlement period plus dispute window.

MO Member explained the changes to the original version of the Mod which were circulated to the Panel on the 26th July 2016 as agreed at Meeting 68. Observer asked if it would be possible to have an account of how many of the listed disputes from previous years would fall within the proposed timelines and a number of other Members and observers agreed that this would be useful information to have before taking a vote on the Mod.

No further observation was raised on the current drafting. MO member agreed to include details of the timelines of disputes and circulate those before Meeting 70. This proposal will be discussed at Meeting 70.

3   Service Delivery

This metric is to indicate how timely SEMO was in producing reports to Participants

3.1   Core Market Operations Function Performance excluding ad-hoc Re-pricing and Re-settlement

SEMO's daily obligations include closing the market gate, issuing Ex-Ante Indicative schedules, running Indicative and Initial pricing runs and issuing Initial and Indicative Settlement runs. The following series of graphs shows the percentage of all reports issued in the Quarter that were on time, late by less than an hour or late by over an hour. In summary, the majority of reports are published on time or within an hour of the required time. Priority is given to the Initial Reports (Ex-Post Initial Pricing Schedule and Initial Settlement Statements).
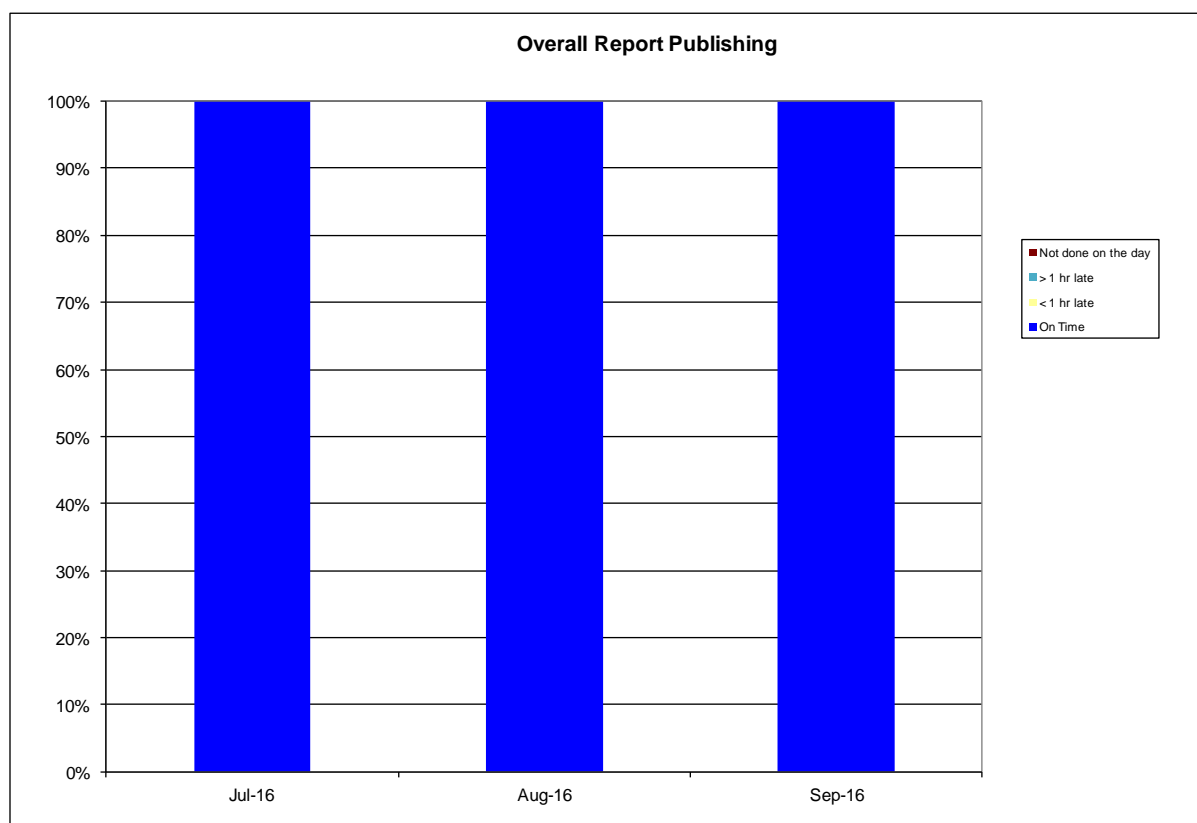

Figure 3 - Overall Daily Report Publication

Gate closure is a significant market event as all bids and offers are required to be captured at that point.
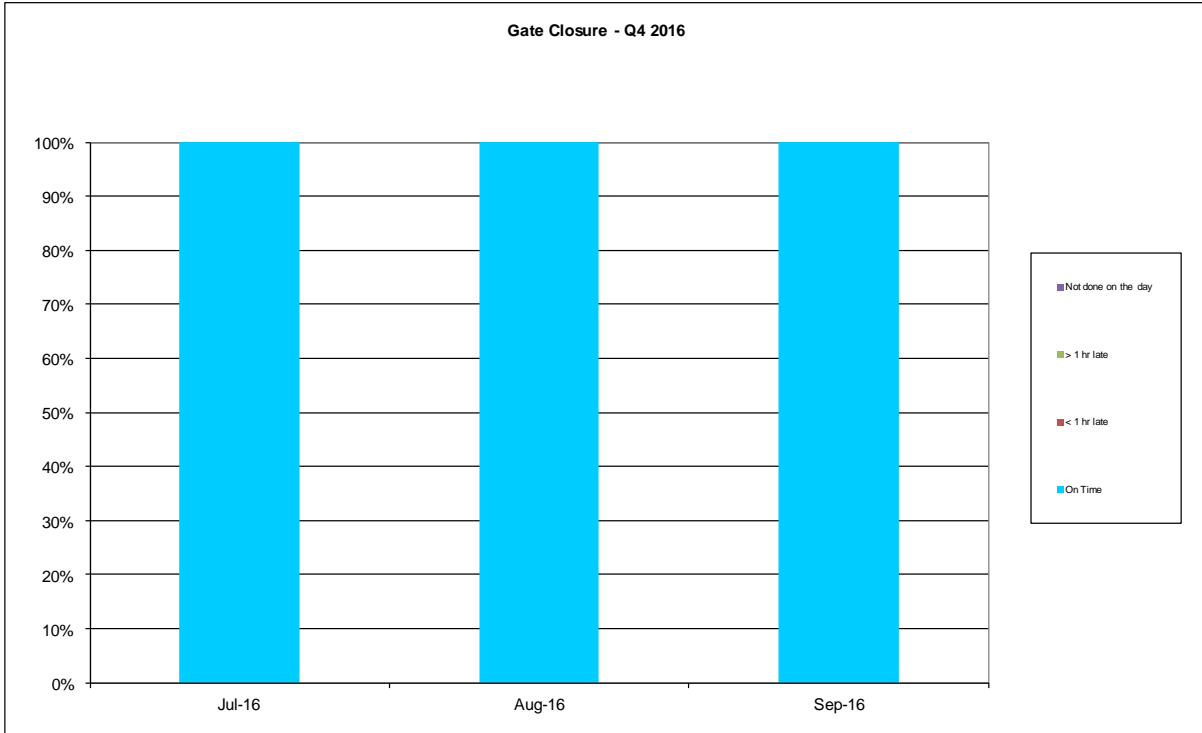
Figure 4 - Gate Closure performance

The Initial Reports (Pricing and Settlement) are published on a calendar and Working Day respectively. It is these reports that are used in the final settlement of the market.
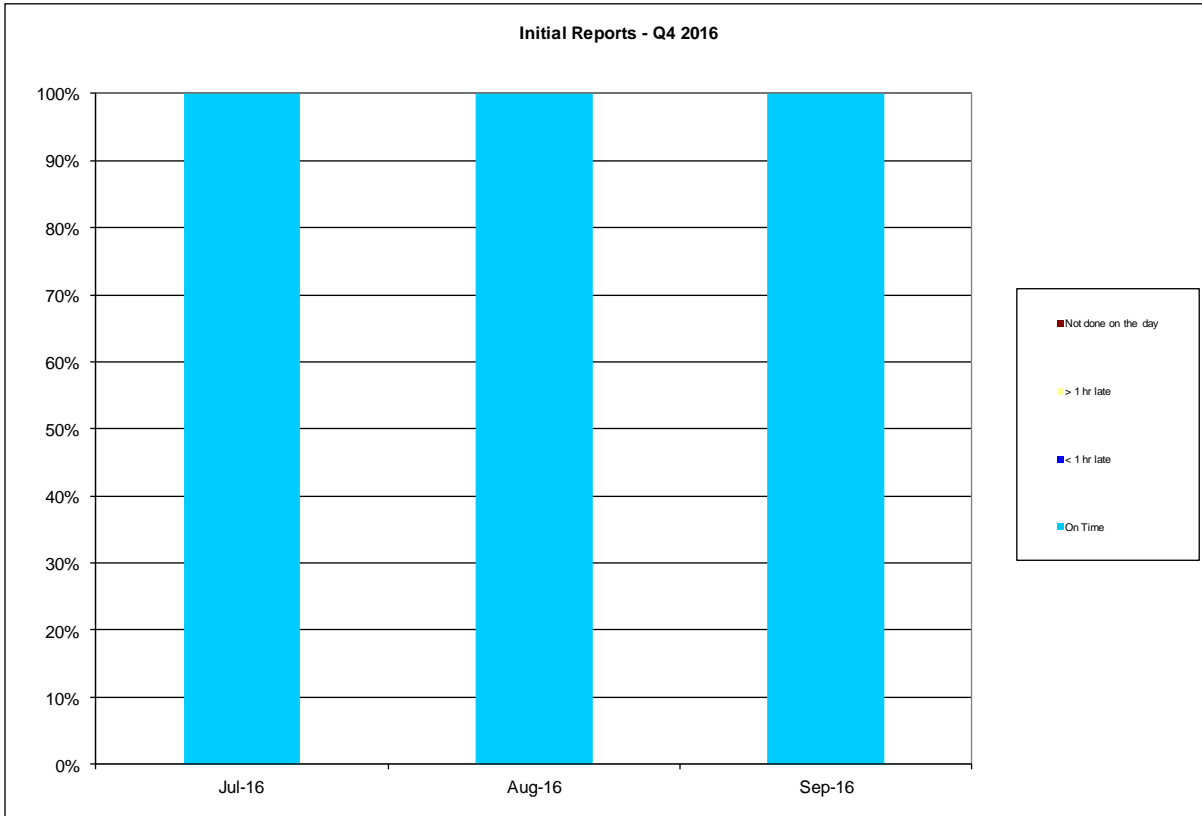

Figure 5 - Initial report performance

All Initial Market Schedules were published within the Trading and Settlement Code time scales.
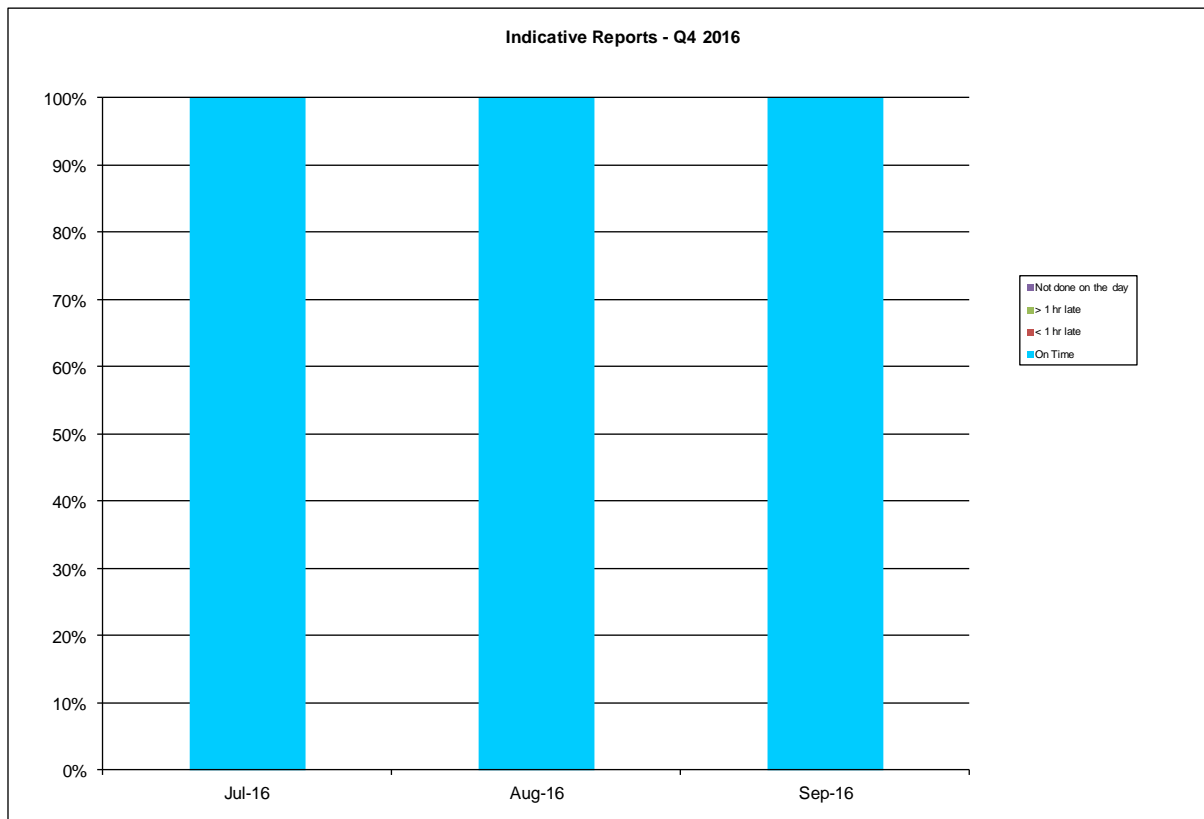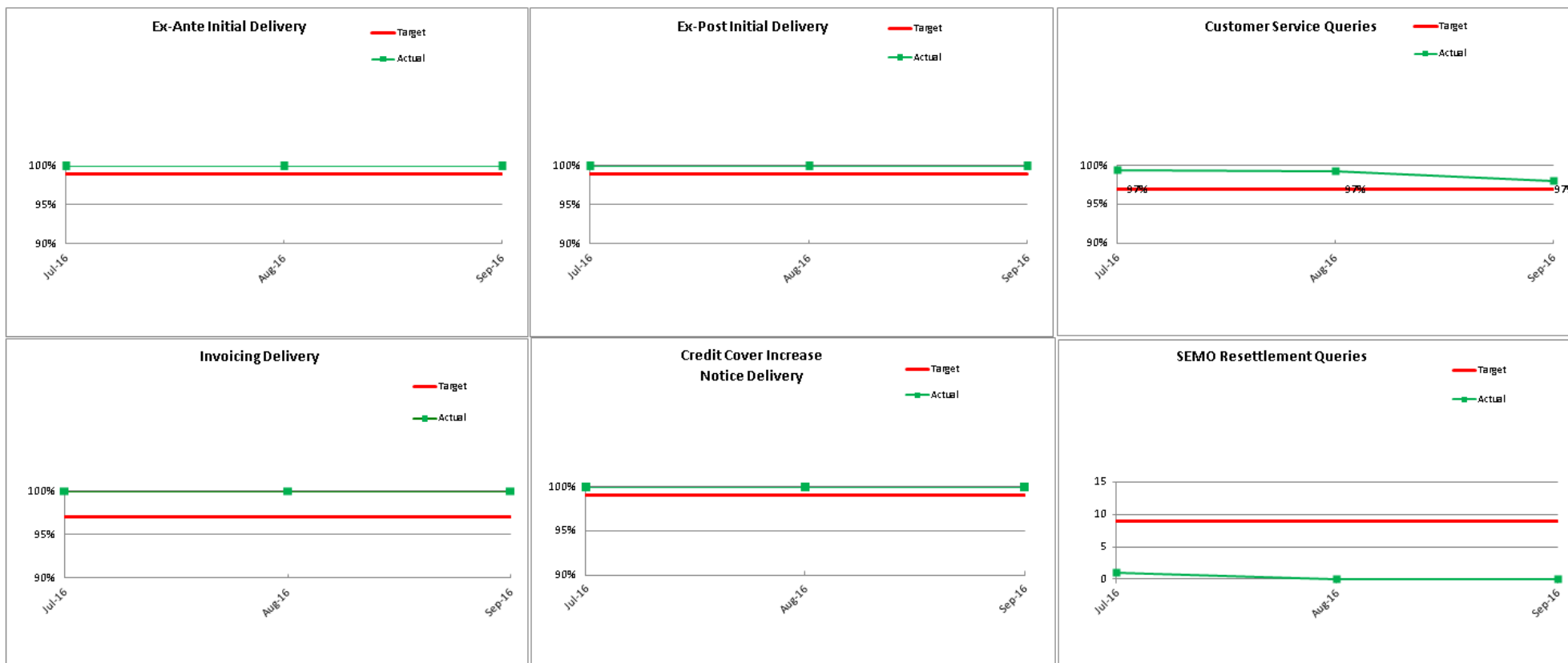

Figure 6 - Indicative report performance

3.2 SEMO Key Performance Indicators

The following graphs display SEMO performance in line with the Key Performance Indicators as set out in the SEM Revenue & Tariffs decision paper.

3.2 *Planned Resettlement M+4 and M+13*

Scheduled Re-Settlement has continued to run on time and on schedule.

3.3 *Ad hoc Pricing and Ad-hoc Resettlement Runs*

<u>*Ad-hoc Re-prices*</u>

There was no Ad hoc re-prices required for Quarter 4.

<u>*Ad-hoc Re-settlement*</u>

There was one Ad hoc resettlement for Capacity month June 2015 in Quarter 4.

3.4 *Administration of Credit Cover*

The SEM has been fully collateralised according to the Trading and Settlement Code provisions during Q4, July 2016 – Sept 2016. However, at times Posted Credit Cover may be less than the calculated requirement leading to Participants being issued with Credit Cover Increase Notices (CCINs). All CCINs were fully honoured within Q4. For more information on Credit Cover in the SEM, please refer to section 6.

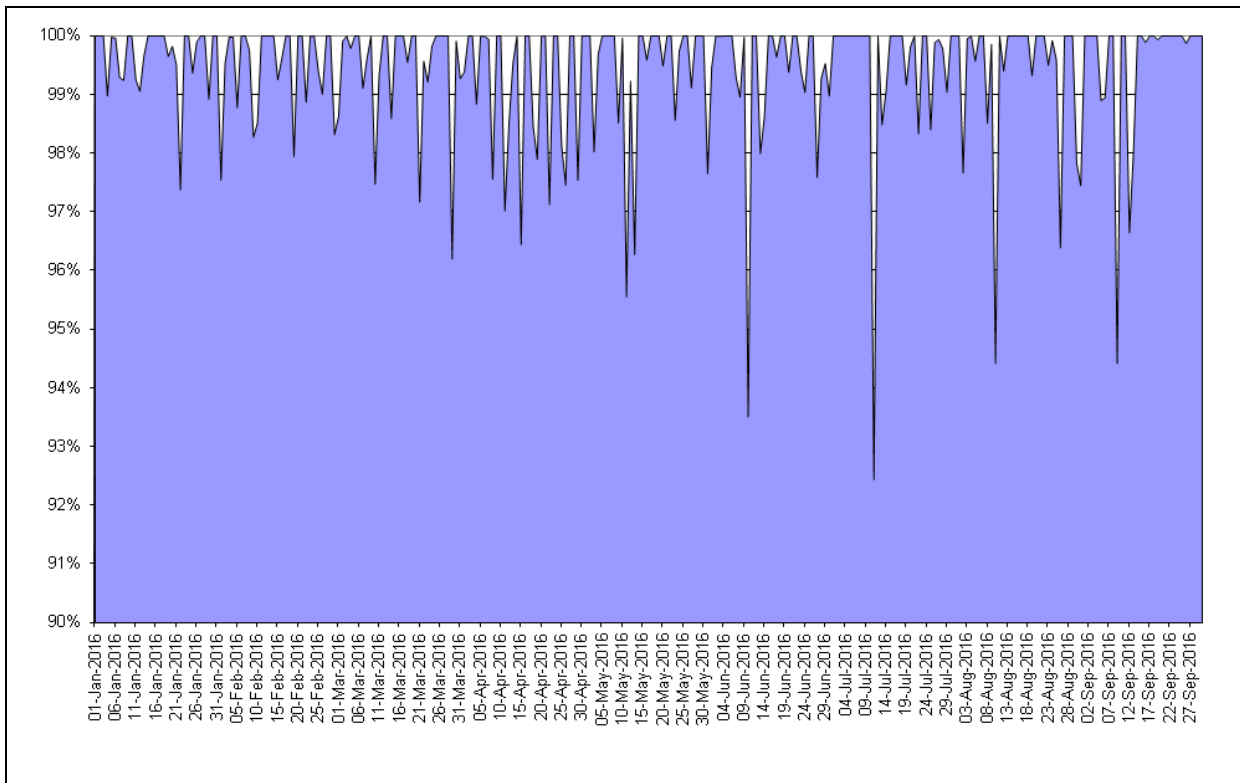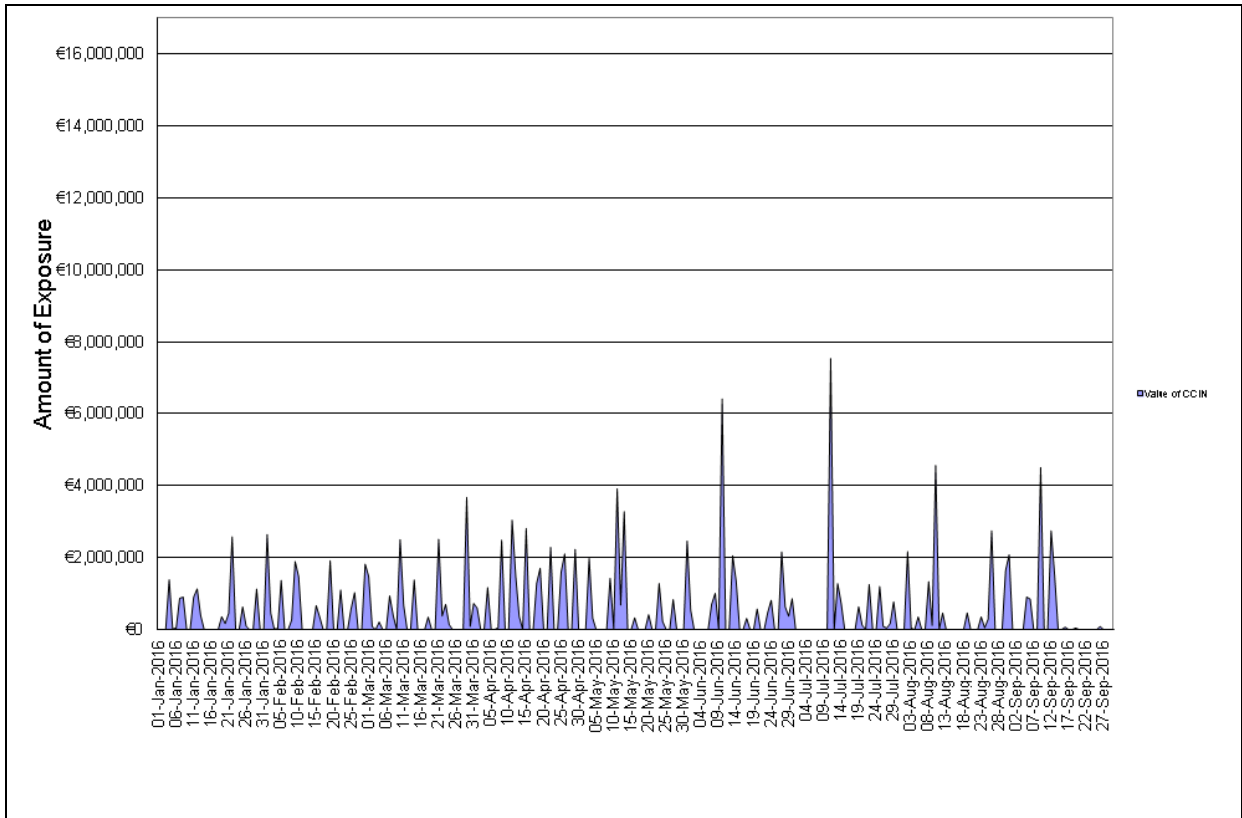**Figure 7 Market Collateralisation in Accordance with Trading and Settlement Code Requirements**

Figure 8 Credit Cover Increase Notice Total Amounts per Day
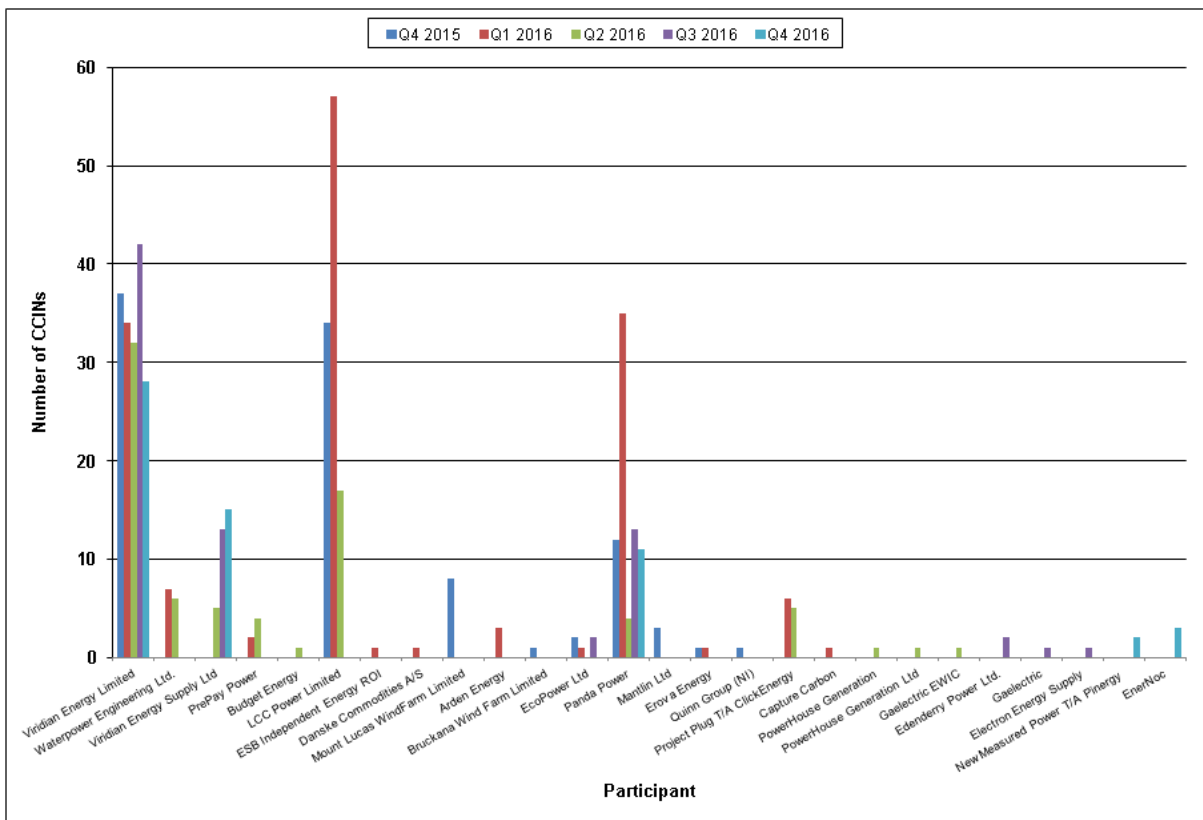
Figure 9 –Number of Credit Cover Increase Notices Issued

14
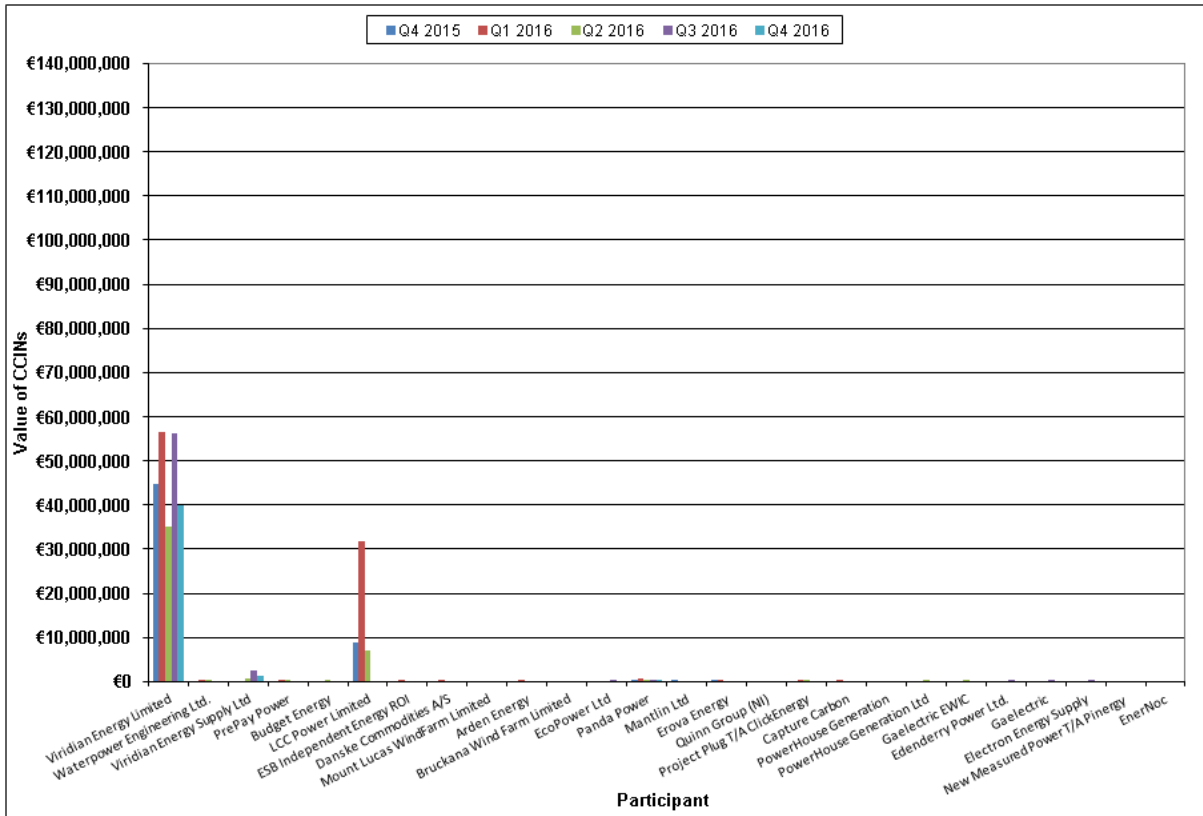
Figure 10 - Value of Credit Cover Increase Notices

The frequency of CCINs decreased in Q4 2016 compared to Q3 2016 (59 compared to 74 last quarter) with the greatest number of CCINs issued in August 2016 (25).

These CCINs were distributed across 5 Participants this quarter compared to 7 last quarter. The total value of the CCINs issued was €41.5 million compared to €59.2 million last quarter.

3.5 Breaches of the Trading and Settlement Code

There were 28 breaches of the Trading & Settlement Code in Q4 2016 that SEMO is aware of. This is down 8 from 36 in Q3 2016.
SEMO was responsible for a total of 3 breaches in this quarter; this is down 7 from 10 in Q3 2016.
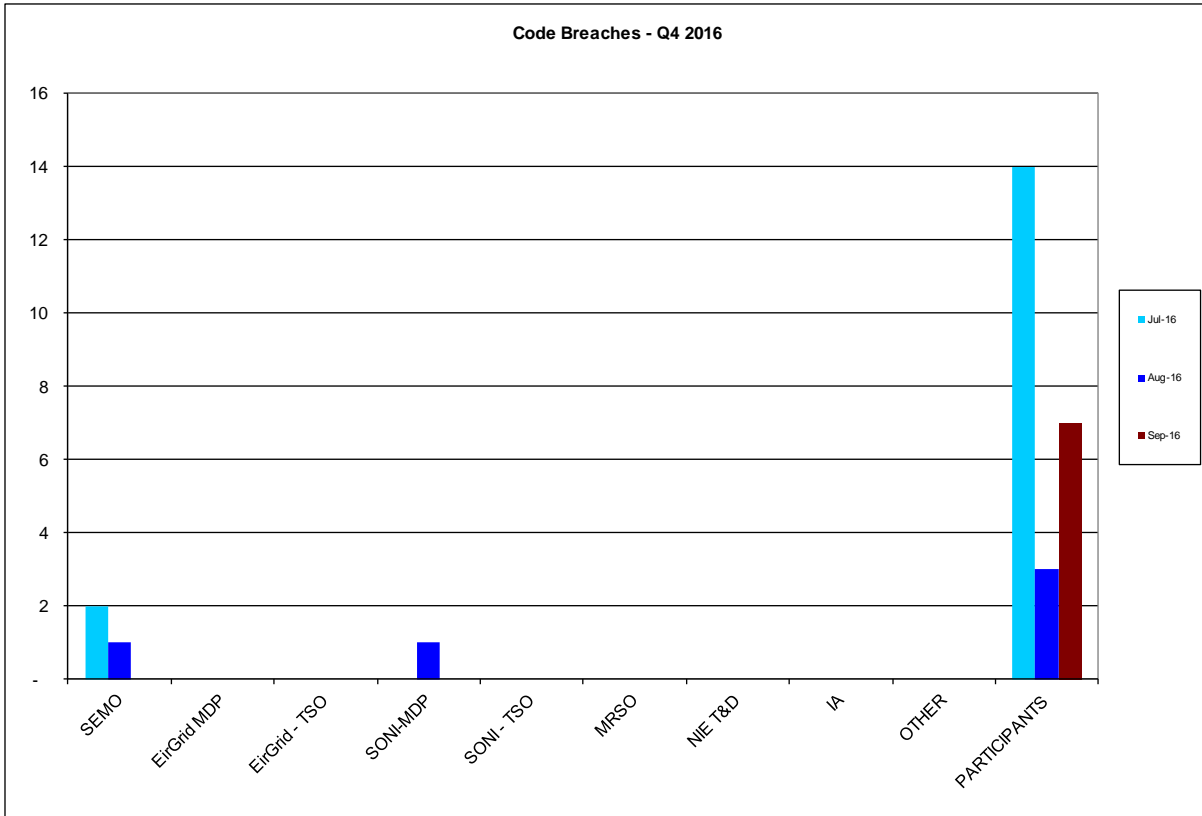
Figure 11 - Number of Trading and Settlement Code Breaches
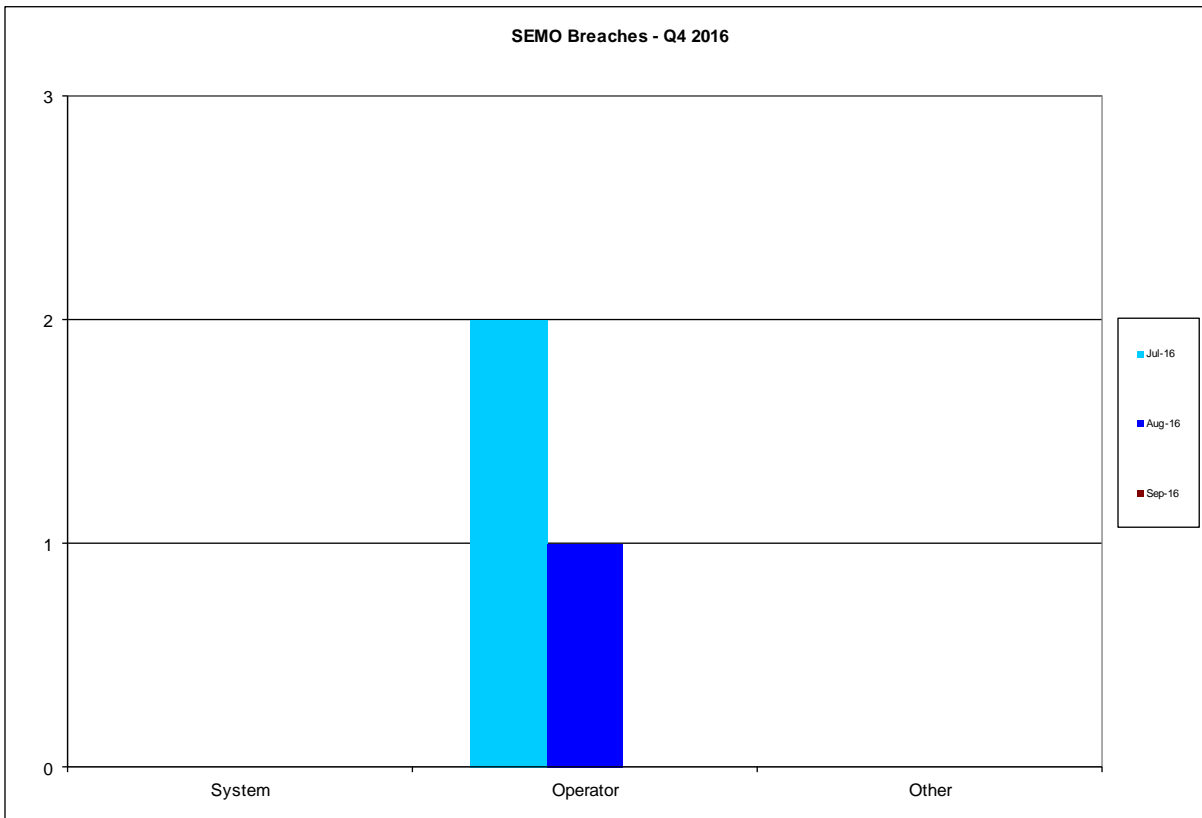
Figure 12 - Source of SEMO Trading and Settlement Code Breaches

4   Regulatory Affairs

SEMO has completed the annual analysis of MSP software parameters and yearly Credit Cover Parameters review. The relevant reports have been issued to the Regulatory Authority by the August deadline for approval and have since been published on the SEMO website.

The Market System Development Plan N.8 (MSDP8) and SEMO KPI report have also been published in this period.

5   Provide Information

The Trading and Settlement Code obligates SEMO to answer Data Queries and Settlement Queries within a given time line. Since 1st November 2007, with the exception of two Settlement Queries, all such queries have been answered within the timelines prescribed. This is still the case for this quarter. General queries have no prescribed timeline for response; however, SEMO aims to answer these within 15 working days. We aim to answer Urgent General Queries within 3 working days; the number of queries answered within SEMO guideline timeframes continues to be a focus for SEMO.

There were no Disputes raised within this quarter.

5.1   Customer Queries in a Timely Manner

Details of Data, Settlement and General Queries can be found in the below table and graphs for the Quarter ending 30/09/2016.

	Received	Resolved within the period	Not Resolved	Resolved in the period	Resolution Time (Working Days)	Resolved On Time
Normal	455	438	17	456	1.05	443
Important	2	2	0	2	0.03	2
Urgent	0	0	0	0	0.00	0
Settlement	18	18	0	18	2.11	18
Credit	0	0	0	0	0.00	0
Dispute	0	0	0	0	0.00	0
Data	0	0	0	0	0.00	0
Total/Average	475	458	17	476	0.64	463

Table 2: Query Statistics for Quarter
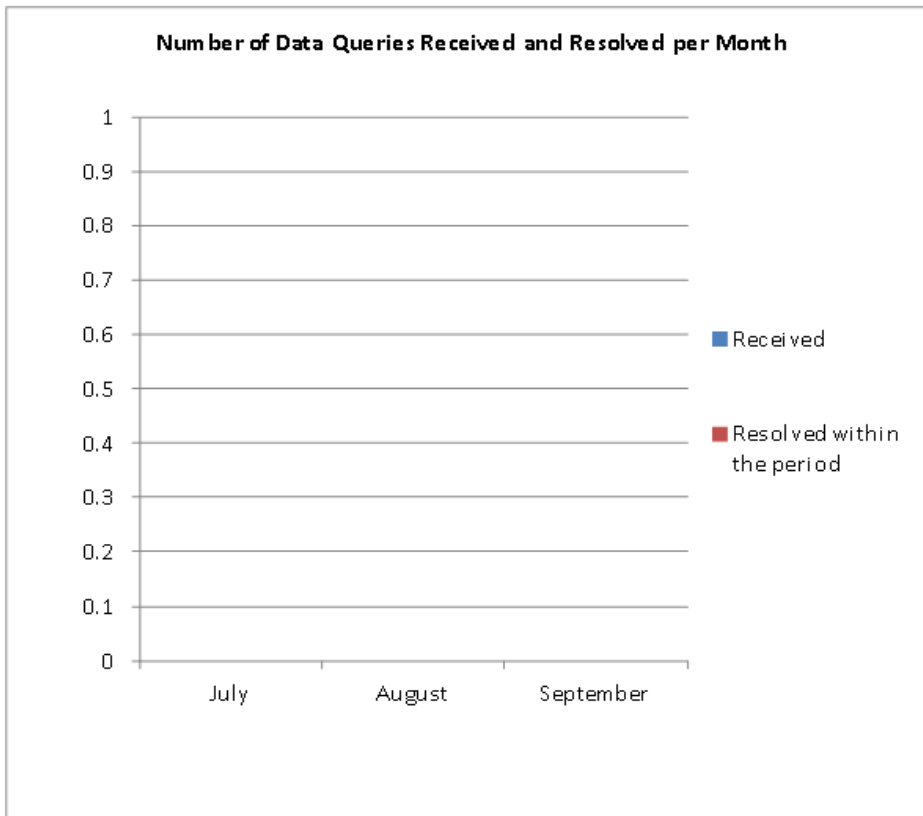
Figure 13 - Number of Data Queries submitted and Resolved per month
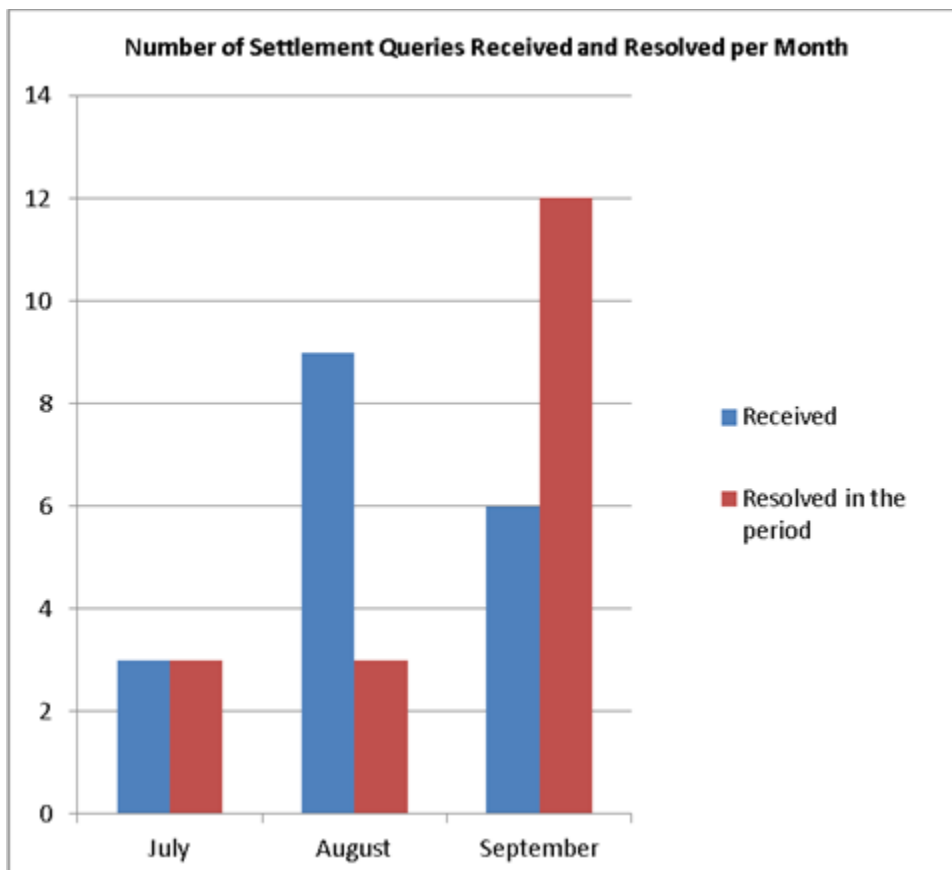
Figure 14 - Number of Settlement Queries submitted and resolved per month
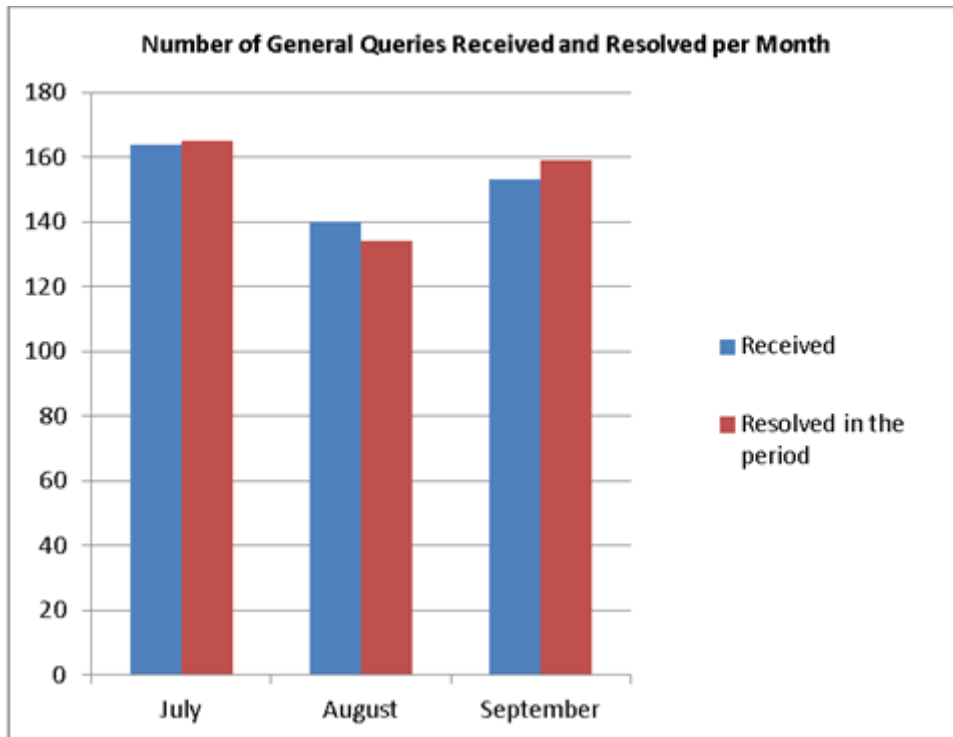
Figure 15 - Number of General Queries submitted and resolved per month
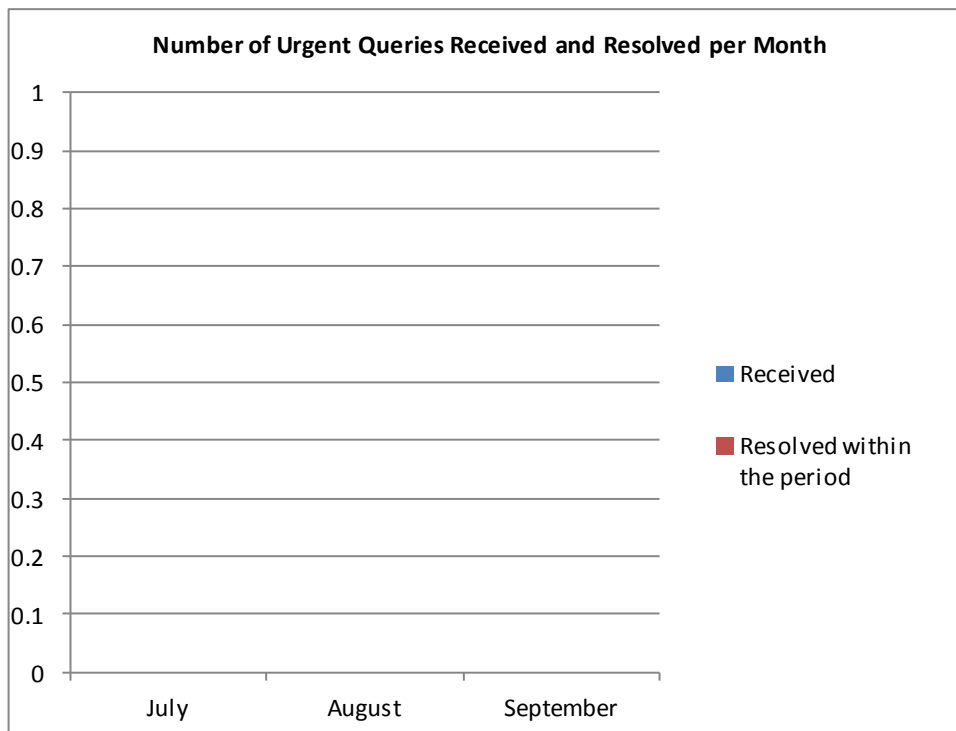
Figure 16 - Number of Urgent Queries submitted and resolved per month
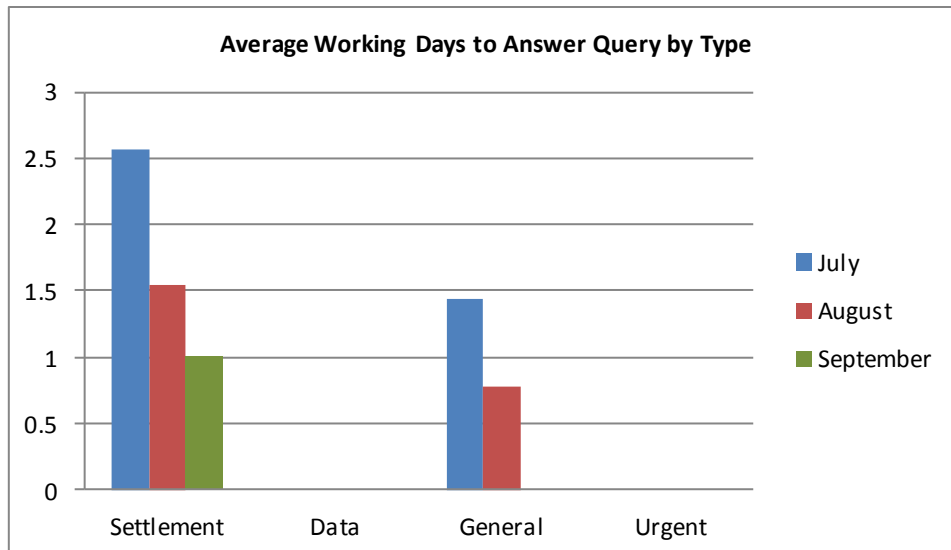
Figure 17 - Average Working Days to answer query type per month

5.1 Facilitate and Educate Participants to accede to the Code

The following acceded to the Code in Quarter 4 2016:

PY_000153 Sliabh Bawn Supply DAC
PY_000156 Green Grid Limited
PY_000157 Gurteen Energy Supply Limited
PY_000158 Meenacloghspar Supply Limited
PY_000159 TrailStone GmbH
PY_000160 Dunman Energy Supply Limited
PY_000163 Gaelectric Sustainable Energy Supply 2
PY_000164 Glanaruddery Energy Supply Limited

5.2 Facilitate Interaction with Customers
Stakeholder Events

SEMO organised individual stakeholder information meetings as requested during registration activities.

6 Required Credit Cover Coverage Analysis

6.1 Foreword on Required Credit Cover Coverage

On a quarterly basis the Market Operator (MO) is obliged under decision paper SEM/07/10 to "compare the extent to which calculated RCC was sufficient to meet the actual liabilities realised in respect of each Participant". This report compares how well the calculated Required Credit Cover (RCC) matches the actual (or realised) RCC in the SEM.

Given the complex nature and volumes of data involved in performing an exact comparison of calculated to realised RCC, the modelling performed was based on a number of assumptions which simplified the analysis. Full details of the assumptions used in the RCC Coverage modelling are provided in Appendix A.

In the results below the term 'under-estimation' refers to situations where the calculated RCC was less than the realised RCC meaning the RCC at the time of calculation was less, in hindsight, than it should have been. The reverse is true for 'over-estimation' where the calculated RCC was more than what was actually required.

Occurrences of under-estimation identified in the analysis do not necessarily mean that the market itself was under-collateralised as this is dependent on the level of Posted Credit Cover. The majority of Participants tend to have sufficient levels of Posted Credit Cover to meet fluctuations in RCC. The under-estimation merely identifies where the calculation of RCC was less than ideal relative to the realised RCC.

6.2 Summary of Required Credit Cover Coverage Analysis

The key conclusions on the RCC Coverage are:

- RCC Coverage was under-estimated 22% of the time in Q4 2016. This showed a increase of 1% compared against Q3 2016. This figure is higher than the long term average of 20% under-estimation since market start. It is lower than the values seen in the same quarter last year.

- The value of each occurrence of under-estimation has increased from the previous quarter from 0.88% to 1.3%, higher than the long term average of 0.73%.

- In Q4 2016, where the RCC Coverage is not sufficient, the market is under-estimated by an average of approximately €1.7 million on a total market exposure of just over €138.5 million. The long term average equates to an under-estimation of approximately €1.7 million on a total average market exposure of €262 million from the beginning of the market.

6.3 Occurrences of Under or Over Estimation

Figure 17 below illustrates the trend in the number of RCC calculations under or over-estimated. For the SEM as a whole, Q4 2016 period has seen the RCC under-estimated on 22% of credit cover calculations. This value is lower than the same period last year and is greater than the previous quarter reported. The average SMP price increased and the demand decreased compared to the previous quarter.
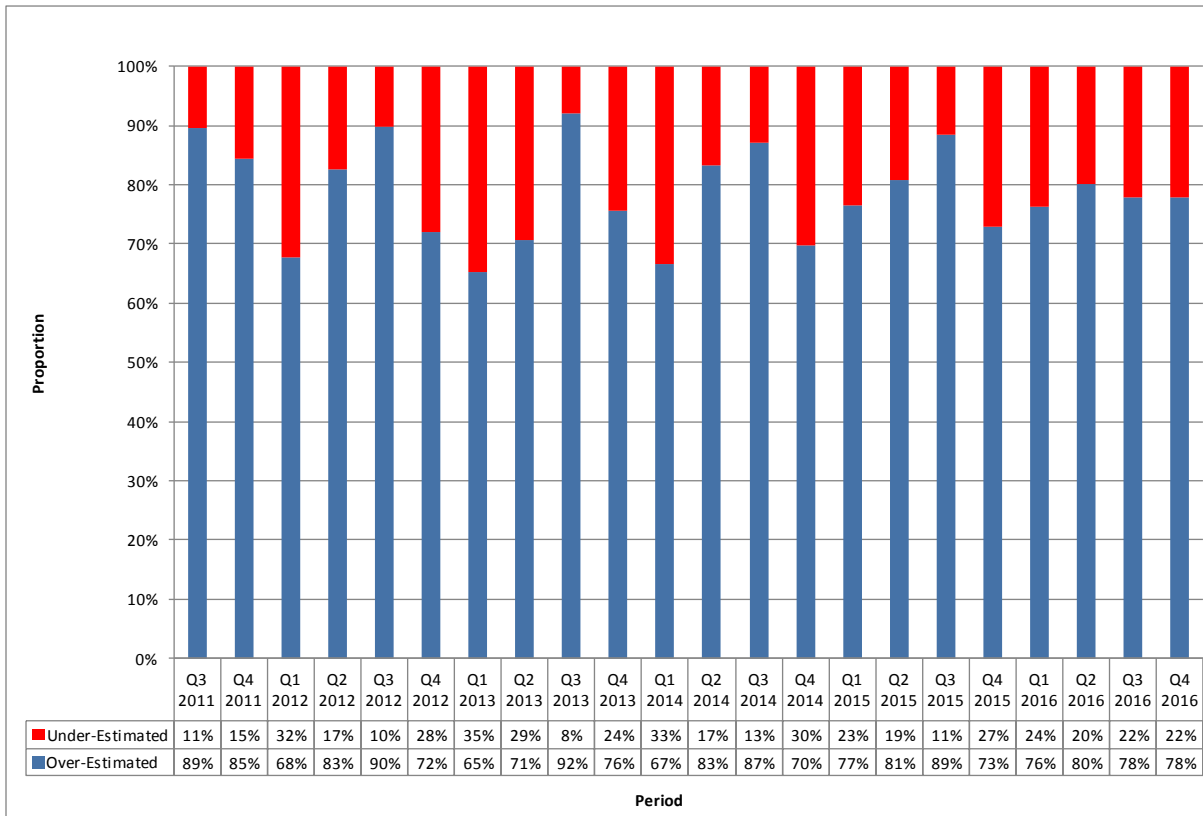
	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013	Q1 2014	Q2 2014	Q3 2014	Q4 2014	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Under-Estimated	11%	15%	32%	17%	10%	28%	35%	29%	8%	24%	33%	17%	13%	30%	23%	19%	11%	27%	24%	20%	22%	22%
Over-Estimated	89%	85%	68%	83%	90%	72%	65%	71%	92%	76%	67%	83%	87%	70%	77%	81%	89%	73%	76%	80%	78%	78%

Period

Figure 17- Occurrences of Under or Over Estimation

As discussed in previous reports on RCC Coverage the key factor in the proportion of under or over estimation is the historical SMP relative to the current period SMP.

Figure 18 below illustrates the trend in average daily SMP for Q4 2016. The daily time weighted average was €36, which is lower than Q3 2016. The SMP has historically been higher and more volatile in the first years of the market. It had then stabilised at lower values from around Oct 14 until Sept 2016. From this time on, we have seen SMP slightly decreasing in average value; however, there has been less deviation with higher peak prices being seen a few times in Q4 2016.

Another factor impacting on the proportion of under or over estimation is the variation in the System Demand which, in this quarter, has decreased by 3% from previous quarter.

These small variations have limited the amount of under estimation in the current quarter, particularly as demand shows and decreasing trend across the Q4 2016.

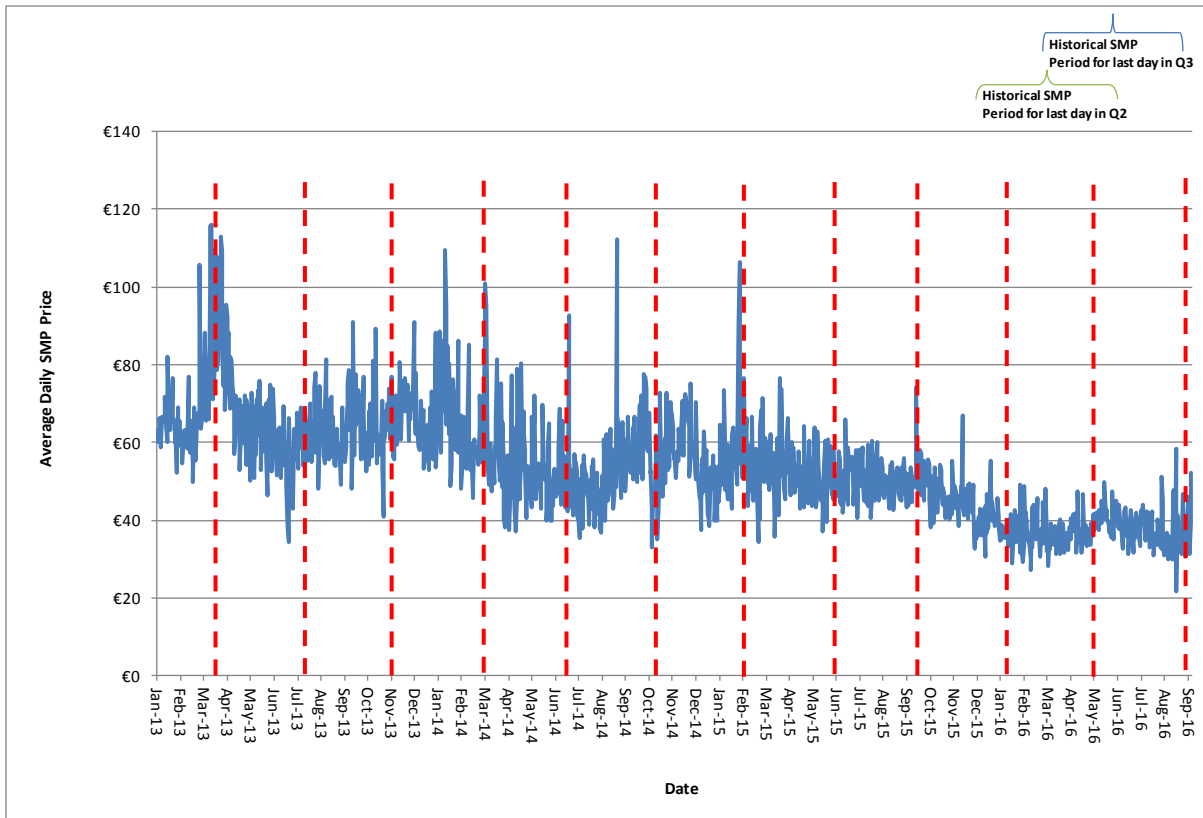**Figure 18- Trend in Average SMP**

6.4 Extent of Under and Over Estimation

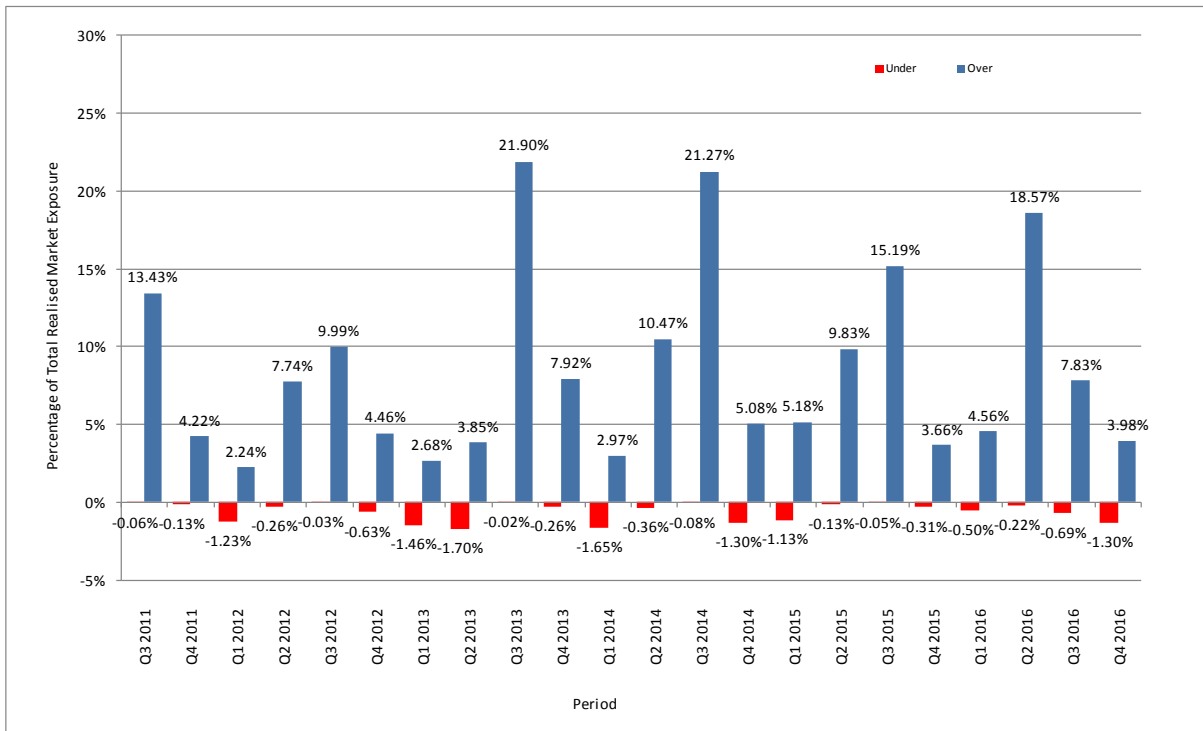Figure 19 below illustrates the trend in the extent to which RCC is under or over-estimated, when it occurs.

Figure 19 – Extent of Under or Over Estimation when under or Over Estimation Occurs

The majority of under-estimation, since the start of the market, is below 1%. Q4 2016 is higher with a figure of 1.3%.

Where over-estimation occurs, this has been on average between approximately 1.54% and 27% since the start of the market. In the quarter under analysis, the extent of over-estimation decreased to 3.98% compared to 9.01% in the previous quarter. This is lower than the long term average of 8.31%.

6.5   Market Monetary Exposure

Figure 20 below shows the actual monetary exposure of the SEM (excluding VAT) to these under or over estimations.

In Q4 2016, from an average exposure of the market of just over €139 million, the market has had an average RCC under-estimation of just over €1.7 million and an average RCC over-estimation of €5.3 million on any given day.
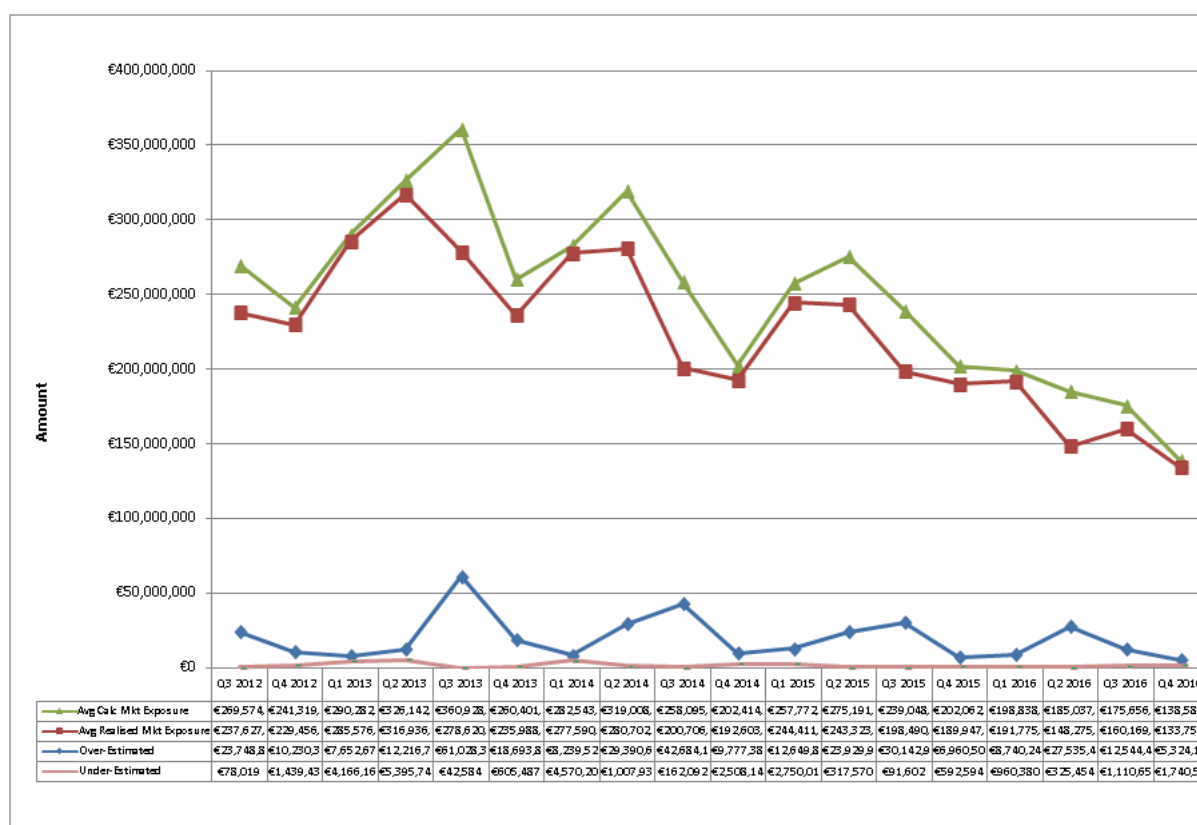
Figure 20 – Monetary Exposure due to Accuracy of Credit Cover Calculations

6.6   All Quarters Summary

For the SEM as a whole, from market start to the end of September 2016, RCC has been under-estimated 20% of the time. Of these occurrences the under-estimation as a percentage of the total realised market exposure is on average 1.3%, or €1.7 million out of a total average realised market exposure of €238 million.

With regard to over-estimation, the SEM as a whole has been over-estimated 78% of the time with the over-estimation as a percentage of the total realised market exposure being on average 3.98%, or €5 million out of a total average realised market exposure of €134 million.

7 Appendix A: Required Credit Cover Coverage

a) Required Credit Cover Coverage Modeling Assumptions

Given the complex nature and volumes of data involved in performing an exact comparison of calculated to realised RCC, the modelling performed was based on a number of assumptions which simplified the analysis.

- Only Participants with Supply Units were considered in the RCC analysis as they are the only Participants that have a positive RCC liability as a result of initial settlement. Generators are considered to have a negative RCC liability (i.e. no liability) as a result of initial settlement. Generators may have a liability due to resettlement but this is covered in credit cover calculations by the fixed credit cover requirement.

- Analysis was performed on a Participant Account basis for supply accounts only.

- All values were converted into Euros for ease of comparison. The exchange rate used was for trade date 14th October 2016. The value was 0.8999 for Euro to Pounds sterling.

- Settlement values used in the analysis are Initial Settlement values, with the exception of some Indicative Settlement values which were used for the last few days of analysis as initial values were not available. This is also the reason for small adjustments to figures published last quarter.

- When compiling the current report, data was available for the retrieval of the realised versus calculated UDE for the whole period up to the end of September 2016.

- Results for previous reporting periods may have changed slightly due to adjustments made to the model. This was to exclude units prior to enough historical data being available for the correct comparison of calculated and actual values. The change in values is not material to the results.

- VAT was not included in calculated or realised figures for Actual, Undefined or total market exposure. Proportions and percentages were determined without the application of VAT. This assumption was deemed to have little bearing on the final results as it is a percentage based tax which would apply to both calculated and realised amounts in the same proportions.

- A methodology was employed that simplified the analysis required in determining Actual Exposure and both calculated and realised Undefined Exposure (UDE). The volumes of processing required would otherwise involve repeating calculations for each day of the market for each Participant for both Energy and Capacity, using the snapshot of inputs for that particular day. This functionality is not available in the Credit Risk Management system implemented for the market and is not practical to perform external to the market systems at this point in time.

  o The Energy UDE and Actual Exposure were determined using settlement amounts for each day of the period being analysed (July 2016 to September 2016).

  o The UDE period for Energy was kept constant at 16 days when comparing calculated and realised RCC. The modelling does not allow for holidays or delays receiving settlement data for weekends, however, the comparison basis

is the same for both calculated and realised RCC. Therefore, this assumption should have minimal effect on the results.

The Actual Exposure for Energy was kept constant at 14 days. This is based on the average Actual Exposure being 7 days invoiced and 7 days un-invoiced.

- Part of the analysis required the comparison of the under or over estimation to the total market exposure. In order to determine the total market exposure the following methodology was used.

    1. Determine Energy UDE

    2. Determine Energy Actual Exposure

    3. Determine Proportion of Total Exposure made up by Energy and Capacity individually

    4. Determine the Capacity contribution to total exposure using the proportions of Energy and Capacity, and the Energy UDE and Energy Actual Exposure.

- The total market exposure proportion was determined using the following assumptions:

    o Energy has a significantly greater effect on the total exposure in the market relative to Capacity. Energy, based on 2016 financial year, is typically 74% of total market exposure, while Capacity is 26% of total market exposure. This is based on the figures for the period Oct 2015 to Sep 2016, of operation of the market, in which the Energy market was approximately €1.5billion and a Capacity market of approximately €530 million.

    o VAT was not included in Total Market Exposure figures.

    o Fixed Credit Cover used to provide collateral for resettlement was not considered as it forms a small proportion of the total exposure and should not affect the calculated versus realised comparisons.

- The first quarter of 2007 only consists of two months, November and December 2007. This is as a result of the market starting on 1st November 2007. All subsequent quarters are three months, and align with the standard reporting year for the market.

- There are only 14 days of analysis included in Q4 2007 as 45 days worth of historical data (HAP) are needed before the calculation of UDE can be determined.

- Please note that as of October 2010 report, reporting graphs now reflect the Financial Year not the Calendar Year as previously presented i.e. Quarter 1 (October – December 2010), Quarter 2 (January – March 2013) and Quarter 3 (April – June 2013).