Version	Description of Change
1.0	First published version
1.1	Inclusion of Traded Not Delivered in Forecast CCR calculations Separate calculation of the ICCR Update to reference approved SEMO Tariffs.
1.2	Clarification of I-SEM Initial Credit Cover Requirements and Forecast Credit Cover Requirements and SEM vs I-SEM credit requirements
1.3	Updates for Traded Not Delivered Exposure and "intraday Traded Not Delivered Exposure", especially pertaining to Assetless Units and Demand Side Units Updates for consolidation of worksheets to remove separate ROI and NI worksheets. Minor updates to order of some sections.

Explanatory Note on I-SEM Initial and Forecast Credit Cover Requirement Calculation Spreadsheet

Introduction

This document provides explanatory notes for understanding the spreadsheet used to calculate a Participant's I-SEM Initial Credit Cover Requirements (CCR) and a forecast of CCR for ~3 months after I-SEM go-live.

The explanation includes how the spreadsheet works, the key assumptions made, details of the methodology used, and any limitation identified on the forecast CCR made.

SEMO is only obliged under the Trading and Settlement Code (TSC) to provide Initial CCR to Participants. However to ensure Participant's also have a view of the potential increase in their CCR over time, SEMO have prepared the Initial and Forecast Credit Cover Requirement Calculation spreadsheet ("IFCR" for short) for each Participant.

Under TSC Part C Section 11.1 and 11.2, all I-SEM Participants will be classed as 'New' Participants at the Cutover Time. As a consequence credit cover calculations will be based on forecast volumes until sufficient historical information is available.

The I-SEM ICCR and Forecast Credit Cover Requirements provided for each Participant only relate to the new I-SEM (TSC Part B) arrangements. Participants will still need to consider separately the credit cover requirements they will need to maintain with the SEM (TSC Part A) - while the existing market winds down.

From I-SEM go-live separate credit reports will be issued for SEM and I-SEM, with the combination of the credit requirements needing to be met by Participants.

Having in place an Interim Transfer Facility will assist Participants in minimising their credit requirements and allocating any credit cover they have between the SEM and I-SEM credit cover requirements.

Warning

Aside from the Initial CCR calculated in the IFCR, the remaining future values of CCR are provided for illustrative purposes only to provide Participants with a general guide of their likely CCR over time.

The actual CCR will be calculated each day by SEMO based on the best available information, including actual settlement results, imbalance prices, and forecast volumes or historical amounts. Therefore, the forecasts of future CCR provided in the IFCR may differ from the actual CCR values.

IFCR Calculations

The following section provides a narrative for each of the tabs in the IFCR.

'1. Inputs' Tab

The '1. Inputs' Tab provides a summary of the parameters used in the calculations of initial and forecast CCR.

The inputs are split into two groups:

1) "Participant Specific Inputs" that relate to the characteristics of the Participant
2) "Global Inputs" that relate to all Participants

Parameters in grey require input based on the characteristics of the Participant.

All other parameters are approved values or calculated using other inputs.

Some of the key parameters worth providing particular mention are:

Participant Specific Parameters	
Parameter	**Explanation**
Jurisdiction	Identifies whether the Unit is classed as ROI (PT_4xxxxxx) or NI (PT_xxxxxx) based on the naming convention for Participant IDs
Number of Units	Refers to how many Supply or Generation Units are related to the Participant. This is used to calculate the Fixed Credit Requirement. Note: Generator Units include Assetless Units, Trading Units and Demand Side Units
Awarded Capacity	Is the total Awarded Capacity for the T-1 2017/2018 for all Units related to the Participant. This is used in the calculation of the Capacity Payments.
Weighted Average Price of Awarded Capacity	In all but a few cases the Clearing Price of the T-1 2017/2018 auction will be used for this parameter i.e. €41,800. It is only valid for a different value to apply where the relevant Participant Units have an Awarded Capacity Price higher than the Clearing Price. This value is used in the calculation of Capacity Payments.
Fixed Credit Cover Requirement for Supplier Units	Derived value based on a combination of the average demand provided in the Supplier Unit forecasts multiplied by the Regulatory Authority (RA) approved Fixed CCR rates per MWh from SEM-17-034, in the absence of any further updated values. With upper and lower limits per Unit based on the RA approved limits from SEM-17-034. An approximation has been used as the forecast volumes for the Supplier Units had already been aggregated on entry in the IFCR. Therefore the Supplier Unit Metered Demand aggregate forecast is compared to the combined Supplier Unit limits for all Supplier Units related to the Participant, rather than calculating the average demand per Unit and then comparing this to the individual limits. The impact of such an approximation is not considered to be material.
Fixed Credit Cover Requirement for Generation Units	RA approved value from SEM-17-034, in the absence of any further updated values.
Interim Transfer Approved	Default is 'No', flag is set to 'Yes' where a Participant has confirmed an interim transfer facility for the Participant between the SEM and I-SEM. The implication is that Fixed Credit Requirements are reduced in this case in accordance with TSC Part C Section 11.4
Forecast Volumes	Are the key forecast volumes needed for calculation of CCR. The sign convention for forecast volumes used in the IFCR is that all consumption/demand/buys are positive, and all generation/sells are negative.

	Values for DAM/IDM and Balancing/Imbalance are required for both Supplier and Generator Units to allow for calculations.

Global Parameters	
Parameter	**Explanation**
Fixed Credit Requirement Parameters	RA approved value from SEM-17-034, in the absence of any further updated values.
Suspension Delay Periods	Assumption is that all Generators (NI/ROI) and Suppliers (NI/ROI) have the same Suspension Delay Periods set to 7 Calendar Days
Historical Assessment Period	RA approved value from SEM-17-034, not used in initial or forecast CCR calculations
Analysis Percentile	RA approved value from SEM-17-034, not used in initial or forecast CCR calculations
Credit Assessment Price	Determined for I-SEM Go-Live based the Transitional Credit Assessment Price methodology defined in TSC Part C Section 11.3. A spreadsheet containing details of the calculation of the Transitional Credit Assessment Price is available from the SEMO I-SEM Website. Re-calculated in June 2018.
Imperfections Price	Approved RA values for 1st October 2018 onward were not available at the time of calculation. SEM-17-076 values were used in their absence.
Residual Volume Error Price	Approved RA values for 1st October 2018 onward were not available at the time of calculation. SEM-18-008 values were used in their absence..
Currency Cost Price	Approved RA values for 1st October 2018 onward were not available at the time of calculation. SEM-18-008 values were used in their absence..
Combined Credit Assessment Price	Calculated in accordance with TSC Part B Section G.14.2.1
Average Price of Awarded Capacity	Based on results of T-1 2018/2019 Capacity Auction Results available from the Capacity Market - Final Capacity Auction Results Report.pdf
Awarded Total Capacity from the 2017/2018 Auction	Based on results of T-1 2018/2019 Capacity Auction Results available from the Capacity Market - Final Capacity Auction Results Report.pdf
Capacity Payments Total Amount	Derived from Average Price of Awarded Capacity multiplied by the Awarded Total Capacity. Used as an input into the calculation of the Capacity Charges as defined in TSC Part B Section G14.3.3.
Forecast Demand (MWh)	Substitute value used in place of the calculation of the total credit assessment volumes for all Suppliers in TSC Part B Section G.14.3.3, due to the unavailability of a complete set of forecasts at the time of calculation. The value is taken from the 2017/2018 Forecast Outturn Demand from the Imperfections Charge Decision SEM-17-076.
Exchange Rate	The Annual Capacity Charge Exchange Rate SEM-18-013 was used as an approximation for the exchange rate that will be used to convert Euro amounts into GBP amounts for Northern Ireland Participants.
Traded Not Delivered	Defines the number of day used for the Traded Not Delivered (TND) components of the IFCR. 1 day has been used for Supplier Units and 2 days for Generator Units to model a conservative approach, as the true TND component will fluctuate between <1 day and 2 days dependent on the timing of settlement and credit reports. TND calculations are defined in TSC Part B Section G14.13. Note: The values in TND do not account for any trading that is intended to have a net zero total between the different DAM/IDM timeframes for a given trading day. Nor do they account for TND exposure related to DSUs that have forecasts netted. Further details on this are provided in the “3. Calculations” section below.

‘2. Exposure Periods’ Tab

The '2. Exposures Period' Tab identifies the relevant Exposure Periods used for the calculation of CCR. The relevant exposure periods relate to a combination of Actual Exposure/Traded Not Delivered/Undefined Exposure (i.e. settled but not paid, traded but not settled, and future exposure).

The Undefined Exposure Period is based on the RA approved Suspension Delay Periods for Suppliers and Generators. For the purposes of these IFCR calculations the Suspension Delay Period is assumed to be seven (7) calendar days for both Generators and Suppliers in both the Republic of Ireland and in Northern Ireland.

Typically there is a day difference in payments in and payments out, the exposure period cycles are typically slightly different for net debtors and net creditors in the SEM. For simplicity, and due to the fact that the estimates are an approximation anyway, the exposure period cycles for debtors and creditors have been assumed to be the same.

Also for simplicity the Undefined Exposure Periods do not take account of Bank Holidays.

The reason for the apparent lag in the Actual Exposure Period values (columns C . G, K, and O), where the Actual Exposure Period is typically 2 days behind the current Settlement Day, is due to the fact that it takes time to complete the settlement calculations after the Trading Day. As an example, at the time the Exposure will be calculated on the first day of the market the Actual Exposure will be zero (no settlements will have been completed), and the Undefined will be 8 days (1 day for the current trading day and 7 days for the Supplier Suspension Delay Period).

The Traded Not Delivered Exposure Periods are defined as 1 day for Supplier Units and 2 days for Generator Units. This is a conservative approach to the application the TND as the true TND component will fluctuate between <1 day and 2 days dependent on the timing of settlement and credit reports.

In addition, the Exposure Period cycles are difference for Trading Charges/Payments and Capacity Charges/Payments because Trading Charges/Payments are settled daily and invoiced weekly, whereas Capacity is settled and invoiced monthly.

'3. Calculations' Tab

The '3. Calculations' Tab provides the main calculations of the Initial and Forecast CCR.

Supplier Unit CCR

Columns B to D provide the Supplier Unit forecast volumes related to each Settlement Day for Day Ahead/Intraday, Imbalance Settlement, and Total Metered Demand respectively. These are used in the calculation of the relevant volumes, charges and hence the CCR.

Columns E to H provided the length of the relevant Actual, Traded Not Delivered, Undefined and Total Exposure Period for a given Settlement Day and are used in the calculation of the relevant volumes to be included in the exposure calculated in columns I to K.

The "Trading Charges - Forecast Actual Volumes in Exposure Period" [column I] are based on the Imbalance Settlement Demand that is related to the "Trading Charges - Actual Exposure Period", while the "Trading Charges - Forecast Undefined Volumes in Exposure Period" [column J] are based on the Total Metered Demand (in accordance with TSC Part B G.14.3.1) that relates to the "Trading Charges - Undefined Exposure Period".

The "Capacity Charges - Forecast Actual and Undefined Volumes in Exposure Period" [column H] are based on the Total Metered Demand that is related to the Capacity Actual and Undefined Exposure Period.

Columns L to O calculate the actual Trading, Traded not Delivered, Trading Undefined Exposure and Capacity for the Exposure Period that relates to the given Settlement Day. For Trading Actuals and

Future Exposure the values are based on the Combined Credit Assessment Price, while the Traded not Delivered are based on the Credit Assessment Price.

Column Q then calculates the total Supplier Unit related exposure as a summation of the all the charges plus the Fixed Credit Cover Requirement. Note: the Traded Not Delivered Exposure is subtracted from the total as it is effectively a credit against other exposures as the contracts have been formed in the DAM/IDM.

Generator Unit CCR

The Generator Unit CCR calculations are determined in columns S to AG, in a similar way to the Supplier Unit calculations. The three main differences are:

1) that the relevant forecast volumes are the Generator Imbalance volumes (in accordance with TSC Part C Section 11.1.1)

2) the Trading Payments are based on the exposure volumes multiplied by the Credit Assessment Price.

3) the capacity payments are not related to the imbalance volumes but are related to the Awarded Capacity multiplied by the Exposure period multiplied by the relevant Price of Awarded Capacity.

Column AG then calculates the total Generator Unit related exposure as a summation of the Actual and Undefined Trading Payments and Capacity Payments, less the TND plus the Fixed Credit Cover Requirement.

Column AI then provides the summation of the Supplier Units and Generator Units CCR Participant to give the final figure for CCR. A negative value indicates no credit cover requirement, a positive figure indicates a CCR that must be met for the I-SEM.

Initial Credit Cover Requirement.

A separate row (row 5) has been included to show the calculation of the ICCR, as opposed to the forecast CCR. This is the credit cover that must be in place before the start of the I-SEM. The calculation of the ICCR is based on future exposure only and so does not include actuals or traded not delivered values.

Forecast Credit Cover Requirements Calculations for Demand Side Units

Mod_09_18 “Interim Credit Treatment for Participants with Trading Site Supply Units”. seeks to allow for the netting of settlement amounts between a Demand Side Unit (DSU) and its Trading Site Supply Unit (TSSU)for the actual and future exposure periods. In order to model this, the forecast volumes used in the IFRC only consider the net volumes. In most cases this means that the forecast volumes input in the IFRC are set to zero for both supplier and generator units, in order to simulate the netting effect.

However, this means that if a DSU is trading in the Ex-Ante markets then the calculations do not account for any Traded Not Delivered exposure. Therefore, Participants with DSUs will need to account for these TND exposure separately to the provided IFCR calculations.

As an example, a DSU (DSU_1) has traded in the DAM for the 3rd Dec 2018 for a sell of 10MWh. This is incorporated into the I-SEM credit report. This means the Traded Not Delivered exposure for the DAM trade is 10MWh x Credit Assessment Price of €51.37[1] = €514. This would appear as an exposure in an I-SEM credit report for the Participant that has the DSU_1.

The relevant references in the TSC are “G.14.13 Calculations in respect of Traded Not Delivered Exposure for Participants” and “G.15 Calculations of Required Credit Cover for Participants”.

[1] Note the actual TND exposure will be based on the clearing price of the trade. Credit Assessment Price has been used in this illustration as a substitute for the DAM clearing price.

Note the Traded Not Delivered exposure does not impact on Participant's Initial Credit Cover Requirement. However, it may impact on the credit cover requirements after I-SEM go-live and SEMO recommend that Participants consider this Traded Not Delivered exposure in posting collateral and managing their credit cover post I-SEM go-live.

Forecast Credit Cover Requirements Calculations for Assetless Units

Due to simplifications required in estimating the Forecast Credit Cover Requirements, no allowance was made in the calculations for the forecasting a subset of "Traded Not Delivered" exposure that may impact on Participants as a result of the timing of credit reports and Day-Ahead (DAM)/Intraday Auctions(IDA)/Intraday Continuous (IDM).

The Forecast Credit Cover Requirements do not account for any Traded not Delivered exposure that may arise in the case of Assetless Units that - overall may have a net zero position from the DAM/IDM for a given Trading Day - but at the time of the latest credit report may have DAM trades that have not been closed out with a corresponding IDA/IDC trade. These TND exposures are referred to as "intraday Traded Not Delivered" exposures in the following paragraphs. The "intraday Traded Not Delivered" exposures are different to the TND exposures that the model does cater for which are based on the net TND of the unsettled Trading Days.

As an example, Assetless Unit (AU_1) has traded in the DAM for the 3rd Dec 2018 for a sell of 50MWh. This is incorporated into the credit report which is initiated at 15:30 on 3rd Dec 2018. At this point in time the intended intraday trade to buy 50MWh has not completed as this will occur in the intraday auction scheduled for 17:30. This means the Traded Not Delivered exposure for the DAM trade is 50MWh x Credit Assessment Price of €51.37[2] = €2568. This would appear as an exposure in a credit report for the Participant that has the AU_1.

The relevant references in the TSC are "G.14.13 Calculations in respect of Traded Not Delivered Exposure for Participants" and "G.15 Calculations of Required Credit Cover for Participants".

The rationale for why this Traded Not Delivered Exposure is included in the TSC credit calculations is because there is a potential exposure in the imbalance settlement from the DAM sell trades until such time as the IDM buy trades have been confirmed. Hence, SEMO access the collateral requirement on this basis, not on any assumption that the DAM trades will close out later. If the DAM trades are subsequently closed out by IDM trades, then this Traded Not Delivered Exposure will not be present for the next credit report run.

Note the Traded Not Delivered exposure does not impact on Participant's Initial Credit Cover Requirement. However, it may impact on the credit cover requirements after I-SEM go-live and SEMO recommend that Participants consider this Traded Not Delivered exposure in posting collateral and managing their credit cover post I-SEM go-live.

'4. Results' Tab

The '4. Results' Tab provides a summary of the CCR for each day over the first ~3 months from commencement in the I-SEM, based on the forecast volumes.

This table will be populated in £ or € dependent on the jurisdiction of the Participant.

Column B provides the estimated forecasts of daily CCR over the first ~ 3 months.

The I-SEM initial CCR, for the first day of the I-SEM, is shown as the value in column C.

To assist Participants in understanding their longer term credit cover requirements, and to avoid Participants receiving credit cover increase notices that need to be responded to within two working days, SEMO have also provided an estimate of the maximum CCR for the ~3 months post I-SEM go-live. The estimated maximum CCR is shown in column D.

[2] Note the actual TND exposure will be based on the clearing price of the trade. Credit Assessment Price has been used in this illustration as a substitute for the DAM clearing price.

Cells E2 and E3 provide the initial Transitional CCR and estimated maximum CCR which should appear on a Participants I-SEM initial Transitional Required Credit Cover letter. Note: where the CCR is negative this is set to zero as there is no CCR.

The other values in the table are used for illustrative purposes on the graphs in '5. Chart'.

'5. Chart' Tab

The '5. Chart' provides a graphical representation of the estimated forecasts CCR of the Participant over the first ~3 months of the I-SEM. This illustrates the magnitude and direction the CRR may take over time for a Participant.

Averages are also shown in the graph, as well as maximum estimates.

This chart will be populated in £ or € dependent on the jurisdiction of the Participant.