



Single Electricity Market

INTRA-DAY TRADING: HIGH-LEVEL DESIGN SUMMARY

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1 INTRODUCTION

The current design of the SEM does not provide Market Participants with opportunities for unused Interconnector capacity to be utilised following the current day ahead market Gate Closure. As a result of EU discussions regarding encouragement of further trading between member states, Intra-Day trading within the SEM has been discussed for future implementation.

Intra-Day trading in the SEM was raised in a Modification Proposal raised by the Regulatory Authorities in ROI and NI (Mod_18_10 submitted on 16th March 2010). The Modification Proposal stated from the outset:

“This Modification Proposal, submitted by the RAs is proposed under the aegis of SEM Committee (SEMC) Decision SEM-10-011 on Regional Market Integration, in which the SEMC decided to bring a Modification to the TSC to engender rule changes to facilitate SEM Intra-Day Trading so as to maximise the use of existing and future Interconnectors’ within-day capacity and comply with the requirements of the Congestion Management Guidelines set out in ‘Regulation 714/2009 of the European Parliament and of the Council of 13 July 2009’.”

The Modification Proposal went on to state:

“It is for the Modifications Committee to develop a Modification that it deems best meets the objectives of:

- *Ensuring that Interconnector Users have access to the maximum available transfer capacity on SEM Interconnectors across a range of time frames; and*
- *Facilitating Interconnector Users to respond efficiently to wholesale price differentials between the SEM and its neighbouring market”*

This Modification Proposal has been discussed extensively by industry stakeholders at seven Modification Working Group meetings and the original proposal has been significantly developed via this process.

This document provides a summary of the High Level Design working assumptions that were agreed at these Working Groups.

2 OVERVIEW

2.1 DESCRIPTION

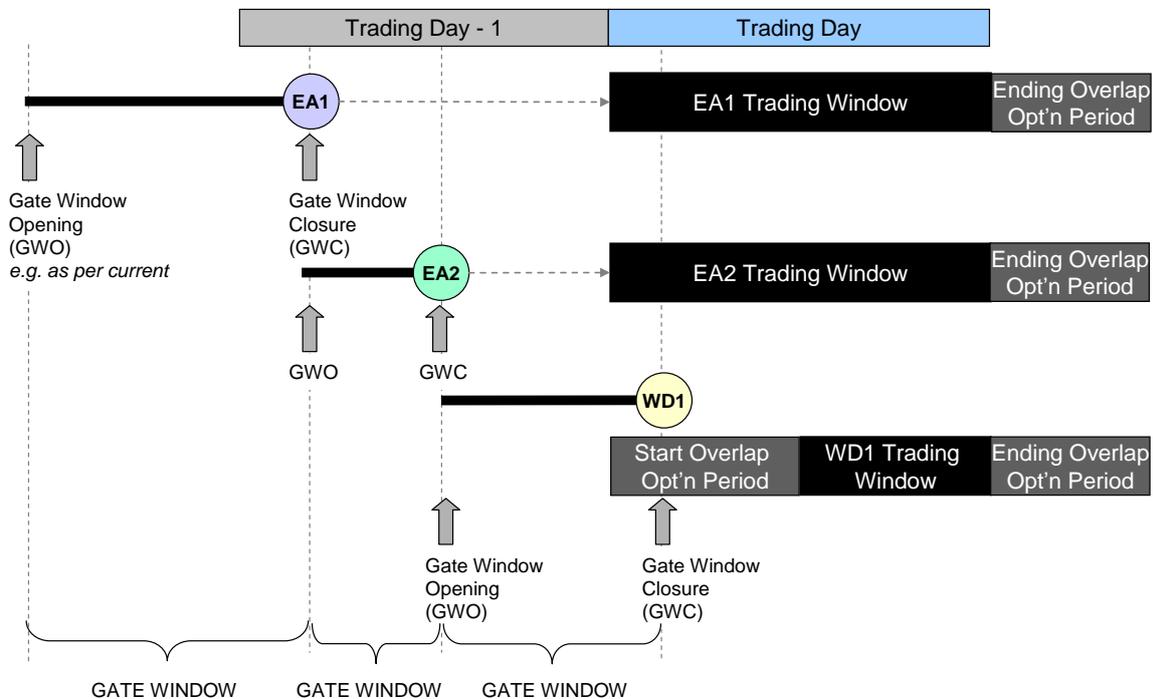


Figure 2-1: Intra-Day Trading Summary

A summary of the design of the Intra-Day Trading solution (Figure 2-1: Intra-Day Trading Summary) is as follows¹:

- There will be three Gate Windows (where the Gate Window timing is as defined in Appendix B - Key Timings): EA1, EA2 and WD1
- Each Gate Window will relate to a Trading Window, which will comprise a portion of the Trading Day (as defined in section Appendix B - Key Timings).
- There will be a separate EA1, EA2 and WD1 Optimisation Time Horizons associated with each Trading Window, with timings as defined in section Appendix B - Key Timings.
- All Generator Units (including Interconnector Units but excluding Interconnector Error Units, Interconnector Residual Capacity Units, Netting Generators Units and Autonomous Generator Units) will be able to submit new or revised data to all Gate Windows:
 - Non-Interconnector Units will be able to submit certain Commercial Offer Data to each Gate Window (as described in section 3.4).
 - Non-Interconnector Units will be able to submit all Technical Offer Data (subject to the current approvals processes) within the EA1 Gate Window and a VTOD set selection to the EA2 Gate Window (as described in section 3.4).
 - Interconnector Units will be able to submit Commercial Offer Data to each Gate Window (only those with Capacity Holdings for EA1). For Interconnector Units, EA1 capacity allocations (MIUNs) will be

¹ Appendix C contains details of the configurability of Optimisation Time Horizons, Gate Windows and Trading Windows with the Central Market Systems.

treated as fixed in the EA2 MSP Software Run and EA1 and EA2 capacity allocations will be treated as fixed in the WD1 MSP Software Run.

- The data used at the Gate Window Opening will depend on the Gate Window to which the data relates:
 - For the EA1 Gate Window, the Starting Gate Window Data used at the Gate Window Opening will be the same as currently (Default Data, as registered).
 - For the EA2 Gate Window, the Starting Gate Window Data used at the Gate Window Opening will be as accepted within the EA1 Gate Window.
 - For the WD1 Gate Window, the Starting Gate Window Data used at the Gate Window Opening will be as Accepted within the EA2 Gate Window.
 - Interconnector Units do not have Default Data or Starting Gate Window Data, therefore if there is no Accepted data, an Interconnector Unit will be treated as though the Interconnector User does not wish to be allocated capacity in the relevant MSP Software Run.
- Commercial Offer Data and Technical Offer Data for use in Ex-Post MSP Software Runs and Settlement will be on a Trading Period basis:
 - For Interconnector Units only, the Commercial Offer Data from the EA1, EA2 and WD1 Gate Windows will be considered separately and will be utilised on a Trading Period basis:
 - Commercial Offer Data for the first portion of the Trading Day in the EP1 MSP Software Run (prior to the WD1 Trading Window), will be based on the Accepted data within the EA1 and EA2 Gate Windows.
 - Commercial Offer Data for all Trading Periods within the EP1 MSP Software Run that correspond with those defined within the WD1 Trading Window and the Ending Overlap Optimisation Period will be the Accepted data within the EA1, EA2 and WD1 Gate Windows.
 - Commercial Offer Data for non-Interconnector Units:

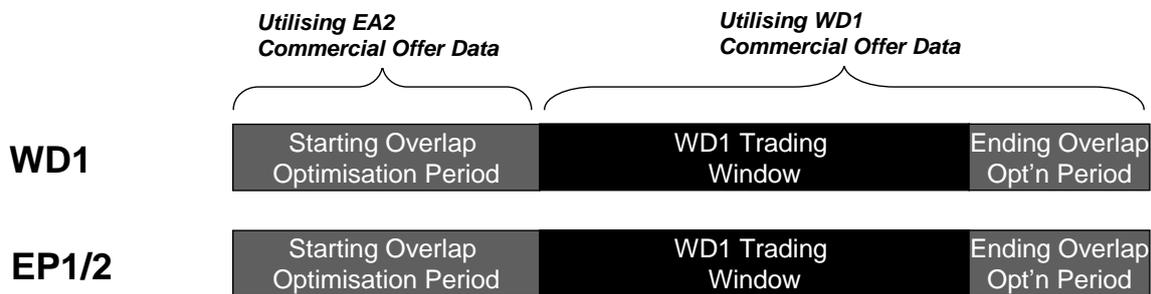


Figure 2-2: Commercial Offer Data in WD1, EP1 and EP2 Runs

- Commercial Offer Data for all Trading Periods within any Ex-Post MSP Software Run that correspond with Trading Periods defined within the WD1 Starting Overlap Optimisation Period will be as Accepted within the EA2 Gate Window (taking into account the Default Data rules). This includes Price Quantity Pairs, which will be considered on a Trading Period basis.
- Commercial Offer Data for all Trading Periods within any Ex-Post MSP Software Run that correspond with Trading Periods defined within the WD1 Trading Window and Ending Overlap Optimisation Period will be as Accepted within the WD1 Gate Window (taking into account Default Data rules). This includes Price Quantity Pairs, which will be considered on a Trading Period basis.
- Technical Offer Data
 - Technical Offer Data for the Trading Day will be as Accepted within the EA2 Gate Window (taking into account the Default Data rules). Note: the Technical Offer Data for WD1 shall be the same as that used in EA2.

- Interconnector Unit capacity allocations from EA1 and EA2 Ex-Ante Runs will be assumed to be fixed in subsequent Ex-Ante MSP Software Runs:
 - MIUNs determined following the EA1 MSP Software Run will be fixed in the EA2 MSP Software Run.
 - MIUNs determined following the EA2 MSP Software Run will be fixed in the WD1 MSP Software Run, along with the MIUNs determined following the EA1 MSP Software Run.

3 DESIGN SUMMARY

3.1 GATE WINDOWS

There will be three Gate Windows² in respect of each Trading Day, each of which is defined by a Gate Window Opening (the first time at which data for the relevant run can be submitted) and Gate Window Closure (after which data for the relevant run cannot be submitted). Each Gate Window will relate to an associated Trading Window, for which data submitted by the Gate Window Closure will apply.

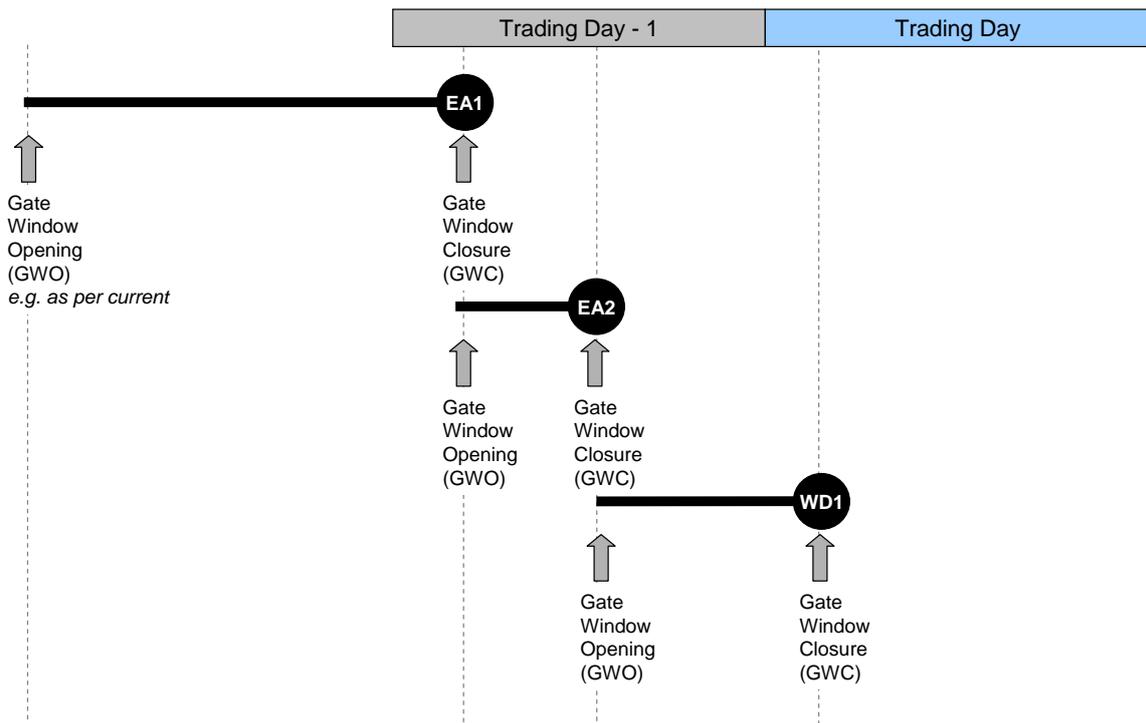


Figure 3-1: Gate Windows

3.2 TRADING WINDOWS

For each Gate Window, there will be an associated Trading Window³. This is the contiguous group of Trading Periods to which Data Transactions submitted within the relevant Gate Window will apply, and for which the Market Schedule Quantities will be calculated by an MSP Software Run. For example:

- Data that is Accepted at the EA1 Gate Window Closure will be used to calculate the Ex-Ante Indicative Market Schedule 1 (EA1) which will cover the EA1 Trading Window (as defined in Appendix B - Key Timings).
- Data that is Accepted at the EA2 Gate Window Closure will be used to calculate the Ex-Ante Indicative Market Schedule 2 (EA2) which will cover the EA2 Trading Window (as defined in Appendix B - Key Timings).

² Appendix C contains details of the configurability of Gate Windows.
³ Appendix C contains details of the configurability of Trading Windows.

- Data that is Accepted by the WD1 Gate Window Closure will be used to calculate the Within-Day Indicative Market Schedule 1 (WD1) which will cover the WD1 Trading Window (as defined in Appendix B - Key Timings).

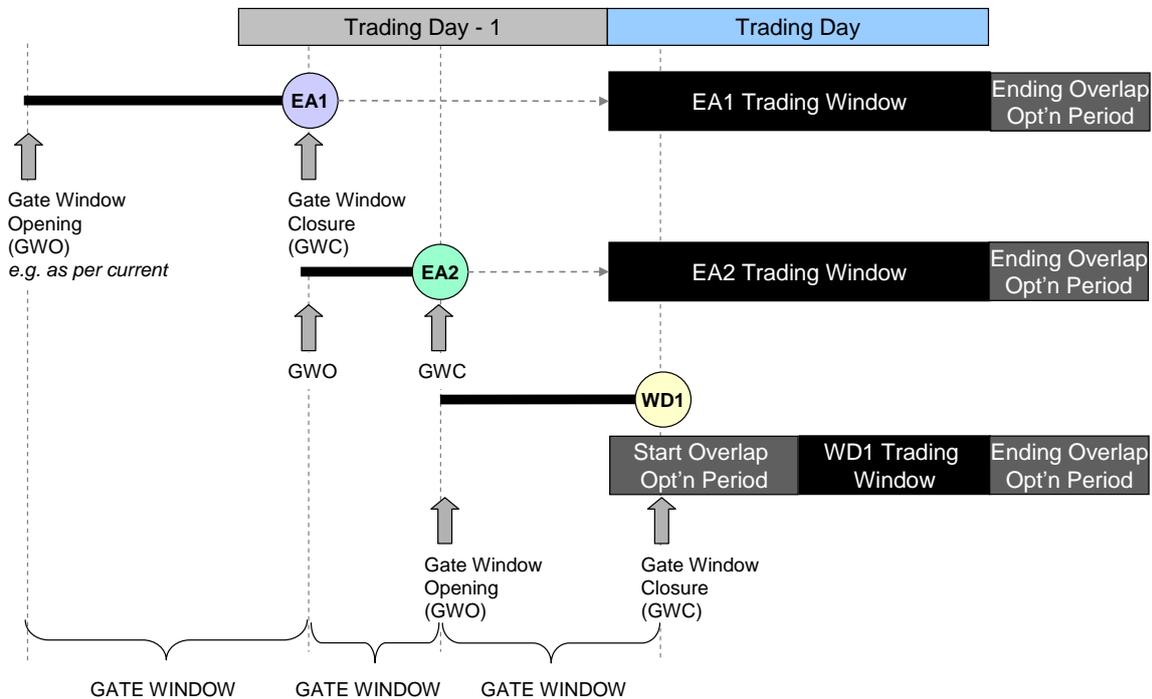


Figure 3-2: Trading Windows

3.3 OPTIMISATION TIME HORIZONS

Each Trading Window within the relevant Trading Day will have an associated Optimisation Time Horizon⁴. This is the contiguous group of Trading Periods over which the relevant MSP Software Run applies. Each Optimisation Time Horizon will include an Ending Overlap Optimisation Period, which is considered by the MSP Software to mitigate boundary issues between consecutive MSP Software Runs.

The Optimisation Time Horizon for the WD1 MSP Software Run will contain both a Starting Overlap Optimisation Period and Ending Overlap Optimisation Period (as detailed in section 3.7.3). As a result, the WD1 Optimisation Time Horizon will incorporate:

- Starting Overlap Optimisation Period (as defined in Appendix B - Key Timings)
- Trading Window (as defined in Appendix B - Key Timings).
- Ending Overlap Optimisation Period (as defined in Appendix B - Key Timings).

⁴ Appendix C contains details of the configurability of Optimisation Time Horizons.

3.4 PARTICIPANT EXTERNAL DATA INPUTS

3.4.1 COMMERCIAL OFFER DATA

The following Commercial Offer Data items may be submitted within the timescales defined by the relevant Gate Window Opening and Gate Window Closure times.

Commercial Offer Data Element	EA1	EA2	WD1	Notes
Single Set of Price Quantity Pairs to apply for the entire Trading Window	Y	Y	Y	PPMGs that are not IUs and are not Under Test.
No Load Costs	Y	Y	Y	PPMGs that are not IUs and are not Under Test.
Start Up Costs – Hot, Warm, Cold	Y	Y	Y	PPMGs that are not IUs and are not Under Test.
Nomination Profile	Y	Y	Y	PPTG, VPTG and Units Under Test
Decremental Price	Y	Y	Y	PPTG, VPTG and Units Under Test
Price Quantity Pairs for each Trading Period in the relevant Trading Window	Y	Y	Y	IUs only
Maximum Interconnector Unit Import Capacity	Y	Y	Y	IUs only
Maximum Interconnector Unit Export Capacity	Y	Y	Y	IUs only
Shut Down Cost	Y	Y	Y	DSUs only
Target Reservoir Level MWh	Y	Y	Y	Pumped Storage Units only

All Commercial Offer Data submissions will contain an indicator which will identify the Gate Window to which they relate (e.g. EA1, EA2 and WD1).

3.4.2 TECHNICAL OFFER DATA / REGISTRATION DATA

The following Technical Offer Data items may be submitted within the timescales defined by the relevant Gate Window Opening and Gate Window Closure times.

Technical Offer Data Element ⁵	EA1	EA2	WD1	Notes
Forecast Availability	Y	Y	Y	PPMG (excluding IUs), PPTG, VPMG, VPTG
Forecast Minimum Stable Generation	Y	Y	Y	PPMG (excluding IUs), PPTG, VPMG, VPTG
Forecast Minimum Output	Y	Y	Y	PPMG (excluding IUs), PPTG, VPMG, VPTG
VTOD Set Selection	Y	Y		PPMG (excluding IUs), PPTG, VPMG, VPTG
All other Technical Offer Data (including Validation Technical Offer Data which does not comprise a registered VTOD Set) and Registration Data	Y			All Units

As currently, the deadline for submission of a VTOD set selection will be ten minutes prior to the relevant Gate Window Closure, i.e.:

⁵ Note: Within the Central Market Systems, this data is submitted within the same XML schema as for Commercial Offer Data.

- For EA1, as defined in Appendix B - Key Timings.
- For EA2, as defined in Appendix B - Key Timings.
- No VTOD set selection can be submitted to the WD1 Gate Window.

Each submission of the Technical Offer Data items or VTOD set selection identifiers will contain an indicator which will identify the Gate Window to which they relate.

No other Technical Offer Data or Registration Data may be re-submitted within the EA2 or WD1 Gate Windows.

3.4.3 DEFAULT DATA / STARTING GATE WINDOW DATA

As required by the Code, a set of Default Data for Generator Units is required for Generator Units (excluding Autonomous Units, Interconnector Units and Netting Generator Units). In respect of Intra-Day trading, the concept of Default Data will not change. However, a new concept of “Starting Gate Window Data” is required, which defines the set of data to be utilised at the start of each Gate Window (and which may be updated by submissions as described in sections 3.4.1 and 3.4.2). This set of data will depend on the data that is Accepted in the previous Gate Window for the relevant Trading Day and will be implemented as follows:

- Within the Ex-Ante 1 (EA1) Gate Window, the Starting Gate Window Data will be the Accepted Default Data and will be populated at the Gate Window Opening. If relevant Data Transactions are received and Accepted within the Gate Window, they will supersede the Starting Gate Window Data. The data from the previous run (relating to the previous Trading Day) will not be utilised.
- Within the Ex-Ante 2 (EA2) Gate Window, the data received and Accepted within the Ex-Ante 1 Gate Window will be the Starting Gate Window Data and will be populated at the Gate Window Opening. If relevant Data Transactions are received and Accepted within the Gate Window, they will supersede the Starting Gate Window Data.
- Within the Within Day 1 (WD1) Gate Window, the data received and Accepted within the Ex-Ante 2 Gate Window will be the Starting Gate Window Data and will be populated at the Gate Window Opening. If relevant Data Transactions are received and Accepted within the Gate Window, they will supersede the Starting Gate Window Data.

Note: Within the EA1, EA2 and WD1 Gate Windows, there is no Starting Gate Window Data for Interconnector Units.

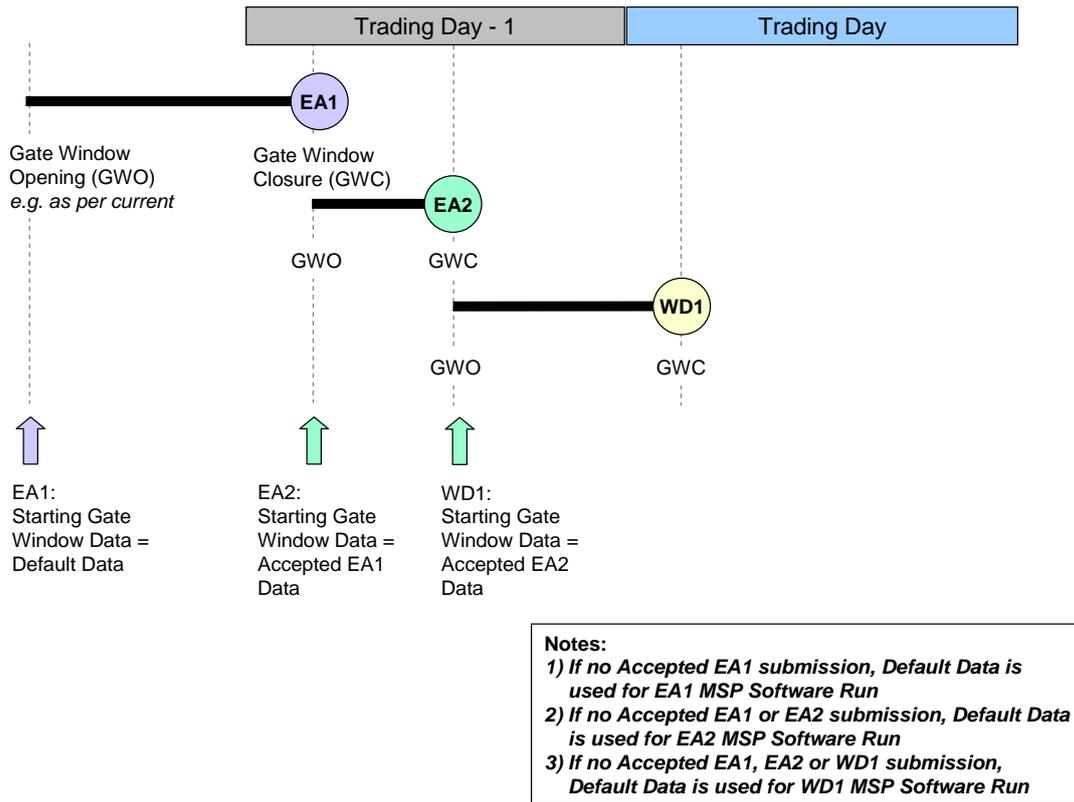


Figure 3-3: Starting Gate Window Data

3.5 NON-PARTICIPANT EXTERNAL DATA INPUTS

The implementation of Intra-Day Trading in the SEM permits updates to key data inputs to be included within the processing (e.g. MSP Software Runs) associated with a given Gate Window. In particular, there is an opportunity to enable updates to data received from:

- System Operators; and
- Interconnector Administrators.

3.5.1 INTERFACES WITH SYSTEM OPERATORS

The following table summarises the key Data Transactions submitted to the Market Operator or received from the Market Operator by System Operators in respect of each Trading Day and identifies where submission to the EA1, EA2 and WD1 Gate Windows will be permitted.

Data Transaction	From/To	EA1	EA2	WD1	Ex-Post
Generator Unit Technical Characteristics (Outturn Availability, Minimum Stable Generation and Minimum Output)	TSO/SEMO				Y
SO Interconnector Trades	TSO/SEMO				Y
Four Day Load Forecast	TSO/SEMO	Y	Y	Y	
Wind Power Unit Forecast	TSO/SEMO	Y	Y	Y	
Bids and Offers	SEMO/TSO	Y	Y	Y	

Data Transaction	From/To	EA1	EA2	WD1	Ex-Post
Interconnector Bids and Offers	SEMO/TSO	Y	Y	Y	
Aggregate Modified Interconnector Unit Nominations	SEMO/TSO	Y	Y	Y	
Market Schedule (EA1, EA2 or WD1)	SEMO/TSO	Y	Y	Y	
Unit Operational Characteristics	SEMO/TSO	Y	Y	Y	
Interconnector Characteristics	SEMO/TSO	Y	Y	Y	

In addition to the Data Transactions above, it is expected that there will be no change to the following Data Transactions (including the timing of their submission) from System Operators to the Market Operator:

- System Parameters (i.e. CLAFs)
- Dispatch Instructions
- Demand Control
- System Characteristics
- Energy Limited Generator Unit Technical Characteristics
- Loss of Load Probability for the Capacity Period (month ahead forecast)
- Ex-Post Loss of Load Probability Table
- Annual Load Forecast
- Monthly Load Forecast
- Uninstructed Imbalance Parameters
- Testing Tariffs
- Forecast Ex-Post Loss of Load Probability

It is also expected that there will be no change to the following Data Transactions (including the timing of their submission) from Market Operator to System Operators:

- Ex-Post Market Schedules (Indicative and Initial)
- Interconnector Registration
- Commencement Notice
- Deregistration Notice
- Jurisdictional Error Supplier Unit Volumes

3.5.2 INTERFACES WITH INTERCONNECTOR ADMINISTRATORS

The following table summarises the key Data Transactions submitted to the Market Operator or received from the Market Operator by Interconnector Administrators in respect of each Trading Day and identifies where submission to the EA1, EA2 and WD1 Gate Windows will be permitted.

Data Transaction	From/To	EA1	EA2	WD1
Interconnector Available Transfer Capacity	IA/SEMO	Y	Y	Y
Active Interconnector Capacity Holdings	IA/SEMO	Y	N	N

Data Transaction	From/To	EA1	EA2	WD1
Modified Interconnector Unit Nominations <i>(noting that this is a Market Operator responsibility and is currently undertaken by SONI in accordance with a formal agreement with the Market Operator)</i>	SEMO/IA	Y	Y	Y
Interconnector User Nominations	SEMO/IA	Y	Y	Y
Interconnector ATC (including as revised)	SEMO/IA	Y	Y	Y

3.5.3 INTERFACES WITH METER DATA PROVIDERS

It is not expected that any changes to the process by which Meter Data Providers collect, prepare and submit Meter Data for use in Ex-Post processing will be required.

3.5.4 DATA CONTINGENCIES

SEMO Intra-Day trading incorporates three Gate Windows within which bids can be submitted (EA1, EA2 and WD1). As a result of the Gate Windows and MSP Software Runs being close together, it is important to proceed with processing where possible. As a result, for each of the key Data Transactions submitted by External Data Providers, there will be contingency data utilised where a given Data Transaction has not been submitted by the associated Gate Window Closure.

Data Transaction	EA1 MSP Software Run Proposed Contingency Data	EA2 MSP Software Run Proposed Contingency Data	WD1 MSP Software Run Proposed Contingency Data
Four Day Load Forecast	Most recent Four Day Load Forecast Accepted by the relevant Gate Window Closure	Most recent Four Day Load Forecast Accepted by the relevant Gate Window Closure	Most recent Four Day Load Forecast Accepted by the relevant Gate Window Closure
Wind Power Unit Forecast	Most recent Wind Forecast Accepted by the relevant Gate Window Closure	Most recent Wind Forecast Accepted by the relevant Gate Window Closure	Most recent Wind Forecast Accepted by the relevant Gate Window Closure
Interconnector Available Transfer Capacity	Most recent ATC data Accepted by the relevant Gate Window Closure	Most recent ATC data Accepted by the relevant Gate Window Closure	Most recent ATC data Accepted by the relevant Gate Window Closure
Active Interconnector Capacity Holdings	In the unlikely event of data not received via the CMS, data shall be faxed and emailed by the IA to SEMO. If not received from the IA (via any of the channels above), zeros will be used. Note: to be agreed by Modifications Committee.	Not applicable	Not applicable
Modified Interconnector Unit Nominations	Not applicable	MIUNs if available from the EA1 MSP Software Run. If not, IUNs if available from the EA1 MSP Software Run. If not, zeros will be used.	MIUNs if available from the EA2 MSP Software Run. If not, IUNs if available from the EA2 MSP Software Run. MIUNs if available from the EA1 MSP Software Run. If not, IUNs if available from the EA1 MSP Software Run. Otherwise, zeros will be used.

3.6 MARKET OPERATOR DATA INPUTS

3.6.1 TREATMENT OF TRADING DAY EXCHANGE RATE

Currently, the Trading Day Exchange Rate is set at 08:00 by the Market Operator for the following Trading Day. The Trading Day Exchange Rate is used to convert Sterling values to Euros prior to use in the MSP Software. Under Intra-Day Trading, a similar approach will be utilised:

- The Trading Day Exchange Rate will be retrieved by the Market Operator at 08:00 to apply for the following Trading Day.
- The relevant Trading Day Exchange Rate will be used to convert Sterling values to Euros for each of the Ex-Ante MSP Software Runs (EA1, EA2 and WD1).

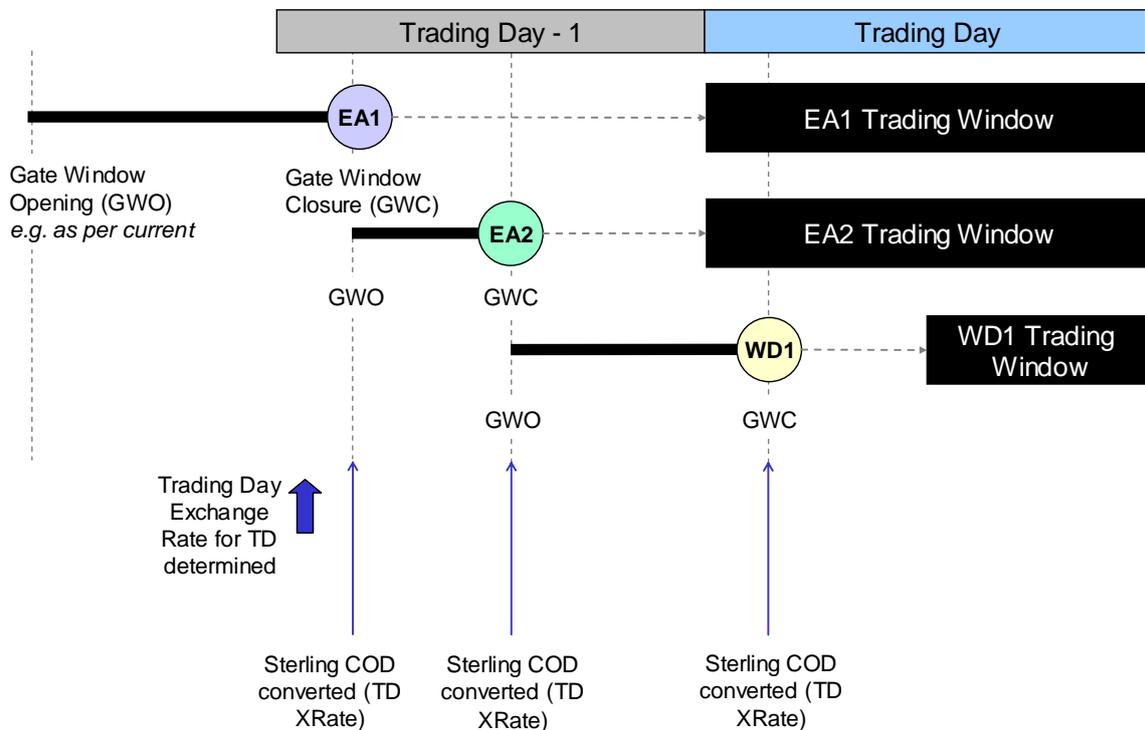


Figure 3-4: Treatment of Trading Day Exchange Rate

3.7 MSP SOFTWARE RUNS

Currently, there are three MSP Software Runs for a given Trading Day:

- Ex-Ante Indicative (EA)
- Ex-Post Indicative (EP1)
- Ex-Post Initial (EP2)

The implementation of Intra-Day trading will result in five MSP Software Runs for a given Trading Day:

- Ex-Ante Indicative MSP Software Run 1 (EA1)
- Ex-Ante Indicative MSP Software Run 2 (EA2)
- Within-Day MSP Software Run 1 (WD1)
- Ex-Post Indicative MSP Software Run (EP1)
- Ex-Post Initial MSP Software Run (EP2)

Currently, all MSP Software Runs comprise the entire Trading Day plus an Ending Overlap Optimisation Period. This will not be the case once Intra-Day trading is implemented, when each Gate Window will relate to a Trading Window and an associated Starting Overlap Optimisation Period and/or Ending Overlap Optimisation Period.

Appendix C - Configurability provides details of the degree to which Gate Windows, Trading Windows and Optimisation Time Horizons will be configurable by the Market Operator within the Central Market Systems.

3.7.1 EX-ANTE INDICATIVE MSP SOFTWARE RUN 1 (EA1)

3.7.1.1 OVERVIEW

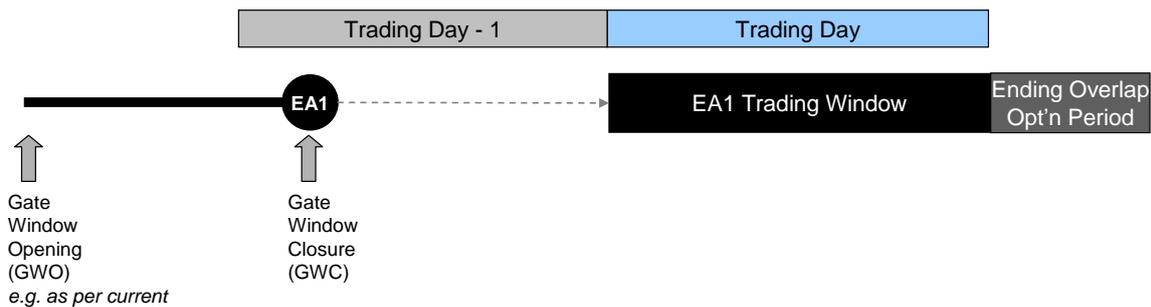


Figure 3-5: EA1 Overview

The EA1 MSP Software Run will be as follows (as per the current Ex-Ante Indicative MSP Software Run, except for a change to the Gate Window Closure time):

- EA1 Gate Window Opening and EA1 Gate Window Closure as defined in Appendix B - Key Timings.
- EA1 Trading Window, as defined in Appendix B - Key Timings.
- Ending Overlap Optimisation Period is the period within the EA1 Optimisation Time Horizon following the EA1 Trading Window (as defined in Appendix B - Key Timings).
- There is no EA1 Starting Overlap Optimisation Period.

- The existing Trading Day Exchange Rate will be used as required to convert all Sterling values into Euros for use in the EA1 MSP Software Run.

3.7.1.2 KEY INPUT DATA

Only Interconnector Users with Active Capacity Holdings may submit offers within the EA1 Gate Window, hence MSQs for Interconnector Units without capacity rights will not be calculated within the EA1 MSP Software Run.

Input Data	Description
Commercial Offer Data (non-Interconnector Units)	<ul style="list-style-type: none"> • As submitted and Accepted within the EA1 Gate Window (noting Default Rules in section 3.4.3). • Applies for the entire Trading Day and associated Optimisation Time Horizon.
Commercial Offer Data (Interconnector Units)	<ul style="list-style-type: none"> • As submitted and Accepted within the EA1 Gate Window (noting that Interconnector Units do not have Default Data). • PQ Pairs and Maximum Import/Export Capacities submitted by Trading Period.
Technical Offer Data	<ul style="list-style-type: none"> • VTOD as per submitted set selection within the EA1 Gate Window (noting Default Rules in section 3.4.3). • Other Technical Offer Data as converted at EA1 Gate Window Opening.
Registration Data	<ul style="list-style-type: none"> • Registration Data will be as converted at EA1 Gate Window Opening.
External Data Provider data	<ul style="list-style-type: none"> • As set out in section 3.5.
Schedule Demand	<ul style="list-style-type: none"> • Schedule Demand will be calculated for the entire Optimisation Time Horizon. • The calculation of Schedule Demand will not change from that currently used for the Ex-Ante Indicative MSP Software Run, a function of: <ul style="list-style-type: none"> ○ Load Forecast ○ Wind Forecast ○ Nominated Quantities for PPTG, VPTG and Units Under Test, as submitted by Participants within the EA1 Gate Window.
Interconnector capacity limits	<ul style="list-style-type: none"> • In the EA1 MSP Software Run, the Interconnector Unit Nominations (capacity allocations) for Interconnector Units are limited by the Active Capacity Holdings (Active Import Capacity Holding and Active Export Capacity Holding) submitted by the Interconnector Administrator and the Maximum Import Capacity and Maximum Export Capacity submitted by the Interconnector User. • $AECH \leq IUN \leq AICH$
Starting conditions	<ul style="list-style-type: none"> • The initial conditions for the EA1 MSP Software Run for TD+1 (e.g. MSQs) will be from the WD1 MSP Software Run for a portion of TD.

3.7.1.3 SCHEDULING IMPACTS

There will be no scheduling changes for the EA1 MSP Software Run from the current Ex-Ante Indicative MSP Software Run:

- Commercial and Technical Offer Data utilised for the entire Optimisation Time Horizon.
- Interconnector Unit capacity allocations will be between MIN(Maximum Interconnector Import Capacity and Active Import Capacity Holding) and MAX(Maximum Interconnector Export Capacity and Active Export Capacity Holding).
- In the EA1 MSP Software Run, there will be no superposition available on any Interconnector, as Interconnector User allocations will be capped by their Active Capacity Holdings.
- Schedule Demand is a function of forecast values (e.g. availability, load, wind).
- Section 3.7.6 contains details of contingency rules that will be applied in the event that the EA1 MSP Software Run is delayed.

3.7.2 EX-ANTE INDICATIVE MSP SOFTWARE RUN 2 (EA2)

3.7.2.1 OVERVIEW

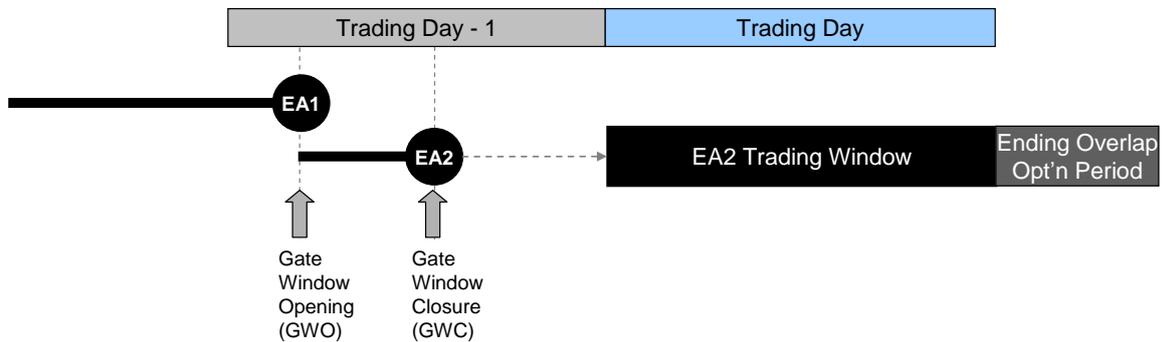


Figure 3-6: EA2 Overview

The Ex-Ante Indicative EA2 Run will be as follows:

- EA2 Gate Window Opening will be at the same time as the EA1 Gate Window Closure.
- EA2 Gate Window Closure is as defined in Appendix B - Key Timings.
- EA2 Trading Window is as defined in Appendix B - Key Timings.
- There will be no EA2 Starting Overlap Optimisation Period.
- Ending Overlap Optimisation Period is the group of Trading Periods within the EA2 Optimisation Time Horizon that is after the EA2 Trading Window (as defined in Appendix B - Key Timings).

3.7.2.2 KEY INPUT DATA

Input Data	Source
Commercial Offer Data (non-Interconnector Units)	<ul style="list-style-type: none"> • As submitted and Accepted within the EA2 Gate Window (noting Default Rules in section 3.4.3). • Applies for the entire Trading Day and associated Optimisation Time Horizon.
Commercial Offer Data (Interconnector Units)	<ul style="list-style-type: none"> • As submitted and Accepted within the EA2 Gate Window (noting that Interconnector Units do not have Default Data). • PQ Pairs submitted by Trading Period.
Technical Offer Data	<ul style="list-style-type: none"> • VTOD as per submitted set selection within the EA2 Gate Window (noting Default Rules in section 3.4.3). • Other Technical Offer Data as Accepted at EA1 Gate Window Open.
Registration Data	<ul style="list-style-type: none"> • Registration Data will be as Accepted at EA1 Gate Window Open.
External Data Provider data	<ul style="list-style-type: none"> • As set out in section 3.5.
Schedule Demand	<ul style="list-style-type: none"> • Schedule Demand will be calculated for the entire Optimisation Time Horizon. • The calculation of Schedule Demand will not change from that currently used for the Ex-Ante Indicative MSP Software Run, a function of: <ul style="list-style-type: none"> ○ Load Forecast (which will be the latest submitted and may be different to that used in the EA1 MSP Software Run) ○ Wind Forecast (which will be the latest submitted and will be different to that used in the EA1 MSP Software Run) ○ Nominated Quantities for PPTG, VPTG and Units Under Test, as submitted by Participants within the EA2 Gate Window (or utilising the Default Data as defined in section 3.4.3).

Input Data	Source
Interconnector capacity limits	<ul style="list-style-type: none"> • In the EA2 MSP Software Run, capacity holdings are not taken into account. • Instead, capacity allocations for Interconnector Units are limited by: <ul style="list-style-type: none"> ○ Capacity allocations from the EA1 MSP Software Run (fixed). ○ the physical capacity of the relevant Interconnector in each Trading Period (ATC, comprised of Maximum Import ATC and Maximum Export ATC). ○ The submitted Maximum Import Capacity and Maximum Export Capacity for the relevant Interconnector Unit. • Interconnector capacity allocations (IUNs) are limited in aggregate, allowing the sum of import allocations and/or export allocations to separately be significantly in excess of the Maximum Export ATC (MEATC) in absolute terms or Maximum Import ATC (MIATC) respectively, such that, <ul style="list-style-type: none"> ○ $MEATC \leq \sum_n IUN_{EA2} + \sum_n MIUN_{EA1} \leq MIATC$
Starting conditions	<ul style="list-style-type: none"> • The initial conditions for the EA2 MSP Software Run for TD+1 (e.g. MSQs) will be from the WD1 MSP Software Run for a portion of TD.

3.7.2.3 SCHEDULING IMPACTS

There are a number of changes required for EA2 MSP Software Runs:

- Interconnector Unit capacity allocations from the EA1 MSP Software Run are fixed within the EA2 MSP Software Run.
- Interconnector Unit capacity allocations (IUNs) will be limited in aggregate by the Available Transfer

$$MEATC \leq \sum_n IUN_{EA2} + \sum_n MIUN_{EA1} \leq MIATC$$

Capacity (ATC), i.e.

- Schedule Demand is a function of forecast values (e.g. availability, load, wind), which are expected to be updated from the Data Transactions submitted to the EA1 Gate Window and used in the EA1 MSP Software Run.
- Section 3.7.6 contains details of contingency rules that will be applied in the event that the EA2 MSP Software Run is delayed.

3.7.3 WITHIN-DAY MSP SOFTWARE RUN (WD1)

3.7.3.1 OVERVIEW

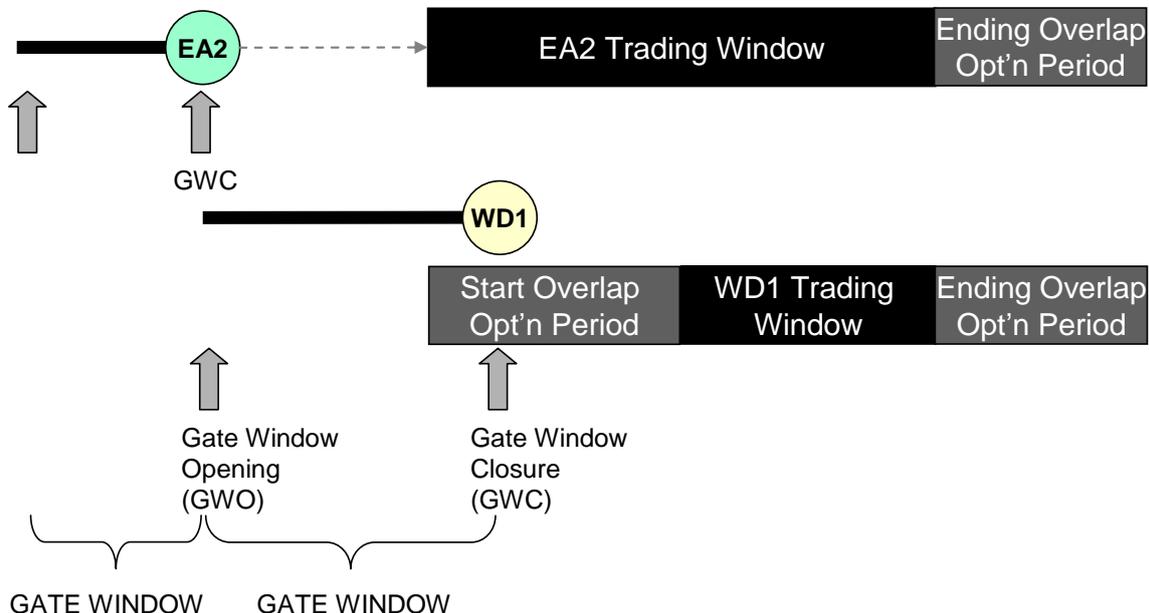


Figure 3-7: WD1 Overview

The Within-Day MSP Software Run 1 will be as follows:

- WD1 Gate Window Opening at the same time as the EA2 Gate Window Closure.
- WD1 Gate Window Closure is as defined in Appendix B - Key Timings. Note that the Gate Window Closure may be after the start of the Optimisation Time Horizon.
- WD1 Trading Window is the second portion of the Trading Day, as defined in Appendix B - Key Timings.
- Ending Overlap Optimisation Period the group of Trading Periods within the WD1 Optimisation Time Horizon that is after WD1 Trading Window. (as defined in Appendix B - Key Timings).
- IUNs in WD1 for Interconnector Units associated with EA1 and EA2 MSP Software Runs will be set equal to their MIUNs for all Trading Periods in the Optimisation Horizon.
- MIUNs for Interconnector Units determined by the EA1 and EA2 MSP Software Runs are fixed during the WD1 Starting Overlap Optimisation Period and will not be re-optimised by the WD1 MSP Software Run.
- COD for Interconnector Units associated with WD1 MSP Software Run applies from the beginning of the Trading Window to the end of the Optimisation Time Horizon.
- MSQs for all non-Interconnector Generator Units will be optimised for all Trading Periods in the Optimisation Time Horizon based on their EA2 COD for the Starting Overlap Optimisation Period and their WD1 COD for the Trading Window and the Ending Overlap Optimisation Period.

3.7.3.2 KEY INPUT DATA

Input Data	Source
Commercial Offer Data (non-Interconnector Units)	<ul style="list-style-type: none"> As submitted and Accepted within the WD1 Gate Window (noting Default Rules). Applies for the period defined by the WD1 Trading Window Start and WD1 Trading Window End and associated Optimisation Time Horizon length. EA2 Commercial Offer Data and Forecast Availability, Minimum Output and Minimum Stable Generation will apply for the Starting Overlap Optimisation Period.
Commercial Offer Data (Interconnector Units)	<ul style="list-style-type: none"> As submitted and Accepted within the WD1 Gate Window (noting that Interconnector Units do not have Default Data). PQ Pairs submitted by Trading Period, for the period defined by the WD1 Trading Window Start and WD1 Trading Window End.
Technical Offer Data	<ul style="list-style-type: none"> VTOD as per submitted set selection within the EA2 Gate Window (noting Default Rules). Other Technical Offer Data as Accepted at EA1 Gate Window Open.
Registration Data	<ul style="list-style-type: none"> Registration Data will be as Accepted at EA1 Gate Window Open.
External Data Provider data	<ul style="list-style-type: none"> To be as supplied, with contingency rules applied if relevant Data Transactions are not received.
Schedule Demand	<ul style="list-style-type: none"> Schedule Demand will be calculated for the period from the WD1 Trading Window Start to the WD1 Trading Window End plus the length of the Optimisation Time Horizon. The calculation of Schedule Demand will not change from that currently used for the Ex-Ante Indicative MSP Software Run, a function of: <ul style="list-style-type: none"> Load Forecast (which will be the latest submitted and may be different to that used in the EA1 MSP Software Run) Wind Forecast (which will be the latest submitted and will be different to that used in the EA1 MSP Software Run) Nominated Quantities for PPTG, VPTG and Units Under Test, as submitted by Participants within the EA2 Gate Window (or utilising the Default Data).
Interconnector capacity limits	<ul style="list-style-type: none"> In the WD1 MSP Software Run, capacity holdings are not taken into account. Instead, capacity allocations for Interconnector Units are limited by: <ul style="list-style-type: none"> Capacity allocations from the EA1 and EA2 MSP Software Runs (fixed). the physical capacity of the relevant Interconnector in each Trading Period (ATC, comprised of Maximum Import ATC and Maximum Export ATC). The submitted Maximum Import Capacity and Maximum Export Capacity for the relevant Interconnector Unit. Interconnector capacity allocations (IUNs) are limited in aggregate, allowing the sum of import allocations and/or export allocations to separately be significantly in excess of the Maximum Export ATC (MEATC) in absolute terms or Maximum Import ATC (MIATC) respectively, such that: <ul style="list-style-type: none"> $MEATC \leq \sum_n IUN_{WD1} + \sum_n MIUN_{EA1} + \sum_n MIUN_{EA2} \leq MIATC$
Starting conditions	<ul style="list-style-type: none"> The initial conditions for the WD1 MSP Software Run (i.e. the start of the WD1 Optimisation Time Horizon) for TD+1 (e.g. MSQs) will be from the WD1 MSP Software Run for a portion of TD.

3.7.3.3 SCHEDULING IMPACTS

The WD1 MSP Software Run represents a within day update to the Ex-Ante indicative schedule, with a Trading Window covering the second portion of the Trading Day. There are number of changes affecting the MSP Software for the WD1 MSP Software Run:

- IUNs in WD1 for Interconnector Units associated with EA1 and EA2 MSP Software Runs will be set equal to their MIUNs for all Trading Periods in the Optimisation Horizon.
- COD for Interconnector Units associated with WD1 MSP Software Run applies from the beginning of the Trading Window to the end of the Optimisation Time Horizon.
- Interconnector Unit capacity allocations will be limited in aggregate by the Available Transfer Capacity (ATC), i.e. $MEATC \leq \sum_n IUN_{WD1} + \sum_n MIUN_{EA1} + \sum_n MIUN_{EA2} \leq MIATC$.

- MSQs for all non-Interconnector Generator Units will be optimised for all Trading Periods in the Optimisation Time Horizon based on their EA2 COD for the Starting Overlap Optimisation Period and their WD1 COD for the Trading Window and the Ending Overlap Optimisation Period.
- Schedule Demand is a function of forecast values (e.g. availability, load, wind), which are expected to be updated from the Data Transactions submitted to the EA1 or EA2 Gate Window and used in the WD1 MSP Software Run.

3.7.4 EX-POST INDICATIVE MSP SOFTWARE RUN (EP1)

3.7.4.1 OVERVIEW

The Ex-Post Indicative MSP Software Run (EP1) will be as follows:

- Ending Overlap Optimisation Period is as defined in Appendix B - Key Timings.
- For non-Interconnector Units, the Commercial Offer Data and Technical Offer Data will be utilised on a Trading Period basis:

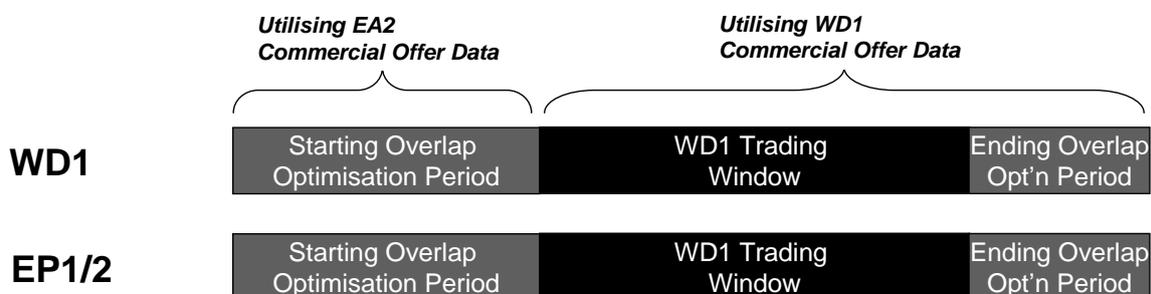


Figure 3-8: Commercial Offer Data for WD1, EP1 and EP2 Runs

- For the first portion of the Trading Day (those Trading Periods in the EP1 Optimisation Time Horizon that are prior to the defined period for the WD1 Trading Window), the Accepted data within the EA2 Gate Window will be used.
- For those Trading Periods in the EP1 Optimisation Time Horizon that are within the defined period for the WD1 Trading Window and the Ending Overlap Optimisation Period, the Accepted data within the WD1 Gate Window will be used.
- Note that all items within the VTOD data set will be consistent across the entire Optimisation Time Horizon, as a new VTOD data set selection may not be submitted to the WD1 Gate Window.
- For Interconnector Units only, the Commercial Offer Data from the EA1, EA2 and WD1 Gate Windows will be considered separately and will be utilised on a Trading Period basis:
 - Commercial Offer Data for the first portion of the Trading Day in the EP1 MSP Software Run (prior to the WD1 Trading Window), will be based on the Accepted data within the EA1 and EA2 Gate Windows.
 - Commercial Offer Data for all Trading Periods within the EP1 MSP Software that correspond with those defined within the WD1 Trading Window and the Ending Overlap Optimisation Period will be the Accepted data within the EA1, EA2 and WD1 Gate Windows.

3.7.4.2 KEY INPUT DATA

Input Data	Source
Commercial Offer Data (non-Interconnector Units)	<ul style="list-style-type: none"> For the first portion of the Trading Day, as submitted and Accepted within the EA2 Gate Window (noting the Default Data rules in section 3.4.3). For the WD1 Trading Window and the Ending Overlap Optimisation Period, as submitted and Accepted within the WD1 Gate Window (noting Default Rules in section 3.4.3).
Commercial Offer Data (Interconnector Units)	<ul style="list-style-type: none"> For the first portion of the Trading Day, as submitted and Accepted within the EA1 and EA2 Gate Windows. For the WD1 Trading Window and the Ending Overlap Optimisation Period, as submitted and Accepted within the EA1, EA2 and WD1 Gate Windows.
Technical Offer Data	<ul style="list-style-type: none"> VTOD for the entire Trading Day, as per submitted set selection within the EA2 Gate Window (noting Default Rules in section 3.4.3). Other Technical Offer Data as Accepted at EA1 Gate Window Open.
Registration Data	<ul style="list-style-type: none"> Registration Data will be as Accepted at EA1 Gate Window Open.
Schedule Demand	<ul style="list-style-type: none"> Schedule Demand will be calculated for the period from the WD1 Trading Window Start to the WD1 Trading Window End plus the length of the Optimisation Time Horizon. The calculation of Schedule Demand will not change from that currently used for the Ex-Post Indicative MSP Software Run.
Interconnector capacity limits	<ul style="list-style-type: none"> In the EP1 MSP Software Run, capacity holdings are not taken into account. Instead, MSQs for Interconnector Units are limited by: <ul style="list-style-type: none"> The capacity allocations (MIUNs) taken from the EA1, EA2 and WD1 MSP Software Runs. Interconnector Unit capacity allocations are treated and limited separately in Ex-Post MSP Software Runs by the allocations within the relevant MSP Software Run: <ul style="list-style-type: none"> Between EA1_MIUN and zero Between EA2_MIUN and zero Between WD1_MIUN and zero

3.7.4.3 SCHEDULING IMPACTS

In Ex-Post processing, the treatment of Non-Interconnector Units and Interconnector Units will be different under Intra-Day trading.

- For Interconnector Units:
 - Interconnector Unit scheduled quantities in Ex-Post will (as currently) be limited between zero and the associated MIUN for each of the MSP Software Runs.
 - As currently, there are no contingencies in the event that the EP1 MSP Software Run is delayed.
- Common features:
 - Schedule Demand is a combination of actual values (e.g. metering) and forecast values (e.g. availability, load, wind).

3.7.5 EX-POST (INITIAL) MSP SOFTWARE RUN (EP2)

3.7.5.1 OVERVIEW

The Ex-Post Initial MSP Software Run (EP2) will be as follows:

- Ending Overlap Optimisation Period is as defined in Appendix B - Key Timings.
- For non-Interconnector Units, the Commercial Offer Data and Technical Offer Data will be utilised on a Trading Period basis:

- For the first portion of the Trading Day (those Trading Periods in the EP2 Optimisation Time Horizon that are prior to the defined period for the WD1 Trading Window), the Accepted data within the EA2 Gate Window will be used.
- For those Trading Periods in the EP2 Optimisation Time Horizon that are within the defined period for the WD1 Trading Window and the Ending Overlap Optimisation Period, the Accepted data within the WD1 Gate Window will be used.
- Note that all items within the VTOD data set will be consistent across the entire Optimisation Time Horizon, as a new VTOD data set selection may not be submitted to the WD1 Gate Window.
- For Interconnector Units only, the Commercial Offer Data from the EA1, EA2 and WD1 Gate Windows will be considered separately and will be utilised on a Trading Period basis:
 - Commercial Offer Data for the first portion of the Trading Day in the EP2 MSP Software Run (prior to the WD1 Trading Window), will be based on the Accepted data within the EA1 and EA2 Gate Windows.
 - Commercial Offer Data for all Trading Periods within the EP2 MSP Software that correspond with those defined within the WD1 Trading Window and the Ending Overlap Optimisation Period will be the Accepted data within the EA1, EA2 and WD1 Gate Windows.

3.7.5.2 KEY INPUT DATA

Input Data	Source
Commercial Offer Data (non-Interconnector Units)	<ul style="list-style-type: none"> ● For the first portion of the Trading Day, as submitted and Accepted within the EA2 Gate Window (noting the Default Data rules in section 3.4.3). ● For the WD1 Trading Window and the Ending Overlap Optimisation Period, as submitted and Accepted within the WD1 Gate Window (noting Default Rules in section 3.4.3). ● Section 3.7.4.3 describes the treatment of COD and TOD for Non-Interconnector Units in Ex-Post Indicative MSP Software Runs.
Commercial Offer Data (Interconnector Units)	<ul style="list-style-type: none"> ● For the first portion of the Trading Day, as submitted and Accepted within the EA1 and EA2 Gate Windows. ● For the WD1 Trading Window and the Ending Overlap Optimisation Period, as submitted and Accepted within the EA1, EA2 and WD1 Gate Windows.
Technical Offer Data	<ul style="list-style-type: none"> ● VTOD for the entire Trading Day, as per submitted set selection within the EA2 Gate Window (noting Default Rules in section 3.4.3). ● Other Technical Offer Data as Accepted at EA1 Gate Window Open.
Registration Data	<ul style="list-style-type: none"> ● Registration Data will be as Accepted at EA1 Gate Window Open.
Schedule Demand	<ul style="list-style-type: none"> ● Schedule Demand will be calculated for the period from the WD1 Trading Window Start to the WD1 Trading Window End plus the length of the Optimisation Time Horizon. ● The calculation of Schedule Demand will not change from that currently used for the Ex-Post Initial MSP Software Run.
Interconnector capacity limits	<ul style="list-style-type: none"> ● In the EP2 MSP Software Run, capacity holdings are not taken into account. ● Instead, MSQs for Interconnector Units are limited by: <ul style="list-style-type: none"> ○ The capacity allocations (MIUNs) taken from the EA1, EA2 and WD1 MSP Software Runs. ● Interconnector Unit capacity allocations are treated and limited separately in Ex-Post MSP Software Runs by the allocations within the relevant MSP Software Run: <ul style="list-style-type: none"> ○ Between EA1_MIUN and zero ○ Between EA2_MIUN and zero ○ Between WD1_MIUN and zero

3.7.5.3 SCHEDULING IMPACTS

In Ex-Post processing, the treatment of Non-Interconnector Units and Interconnector Units will be different under Intra-Day trading.

- For Interconnector Units:
 - Interconnector Unit scheduled quantities in Ex-Post will (as currently) be limited between zero and the associated MIUN for each of the MSP Software Runs.
 - As currently, there are no contingencies in the event that the EP1 MSP Software Run is delayed.
- Common features:
 - Schedule Demand is comprised of actual values (e.g. metering, Dispatch Instructions etc).
 - As currently, there are no contingencies in the event that the EP1 MSP Software Run is delayed.

3.7.6 MSP SOFTWARE RUN CANCELLATION AND CONTINGENCY

The implementation of Intra-Day trading in the SEM introduces new Ex-Ante MSP Software Runs, each of which has dependencies on the results of previous runs. However, the industry has recognised that the timings of the MSP Software Runs is such that there is little or no slack in the processing to allow for delays and hence contingency rules are required. Therefore contingency rules for Intra-Day trading in the SEM have been developed to allow cancellation of some MSP Software Runs, in the event that the relevant MSP Software Run is delayed beyond 30 minutes after the relevant Gate Window Closure. The cancellation of runs will not apply to any EA1 MSP Software Run or Ex-Post MSP Software Run.

In the event that MSP Software Runs are cancelled, contingency rules are required for each MSP Software Run, to ensure transparency in respect of the treatment of two key groups of input data:

- **External Input data** – data received for the relevant MSP Software Run from external parties (e.g. Four Day Load Forecast from System Operators, Commercial Offer Data from Participants).
- **Initial Conditions Data** – scheduled quantities and status information (e.g. latest ON or OFF time) from previous MSP Software Runs.

Section 3.5.4 details the rules to be applied in the event that External Input Data required for a particular MSP Software Run from external parties is not received by the necessary time.

The following table summarises the rules in respect of cancellation and the determination of Initial Conditions Data for following MSP Software Runs. Cancellation will be initiated by a Market Operator user, via the Market Operator Interface.

MSP Software Run Type	Market Operator action if start of processing is delayed by more than 30 mins	Initial Conditions Data
EA1	<ul style="list-style-type: none"> • Proceed with EA1 MSP Software Run (capacity holder bids only for Interconnectors). • Cancel EA2 MSP Software Run. • No EA2 publications. 	<ul style="list-style-type: none"> • Inputs to calculation of Operations Schedule taken from the EA1 MSP Software Run.

EA2	<ul style="list-style-type: none"> • Cancel EA2 MSP Software Run. • No EA2 publications. • EA1 Market Schedule used as input to calculation of Operations Schedule. 	<ul style="list-style-type: none"> • Initial conditions for following WD1 MSP Software Run will continue to be taken from the WD1 MSP Software Run from the previous Trading Day. • Inputs to calculation of Operations Schedule taken from the EA1 MSP Software Run.
WD1	<ul style="list-style-type: none"> • Cancel WD1 MSP Software Run. • No WD1 publications. 	<ul style="list-style-type: none"> • Initial conditions for following EA1 and EA2 MSP Software Runs will be taken from the EA2 MSP Software Run from the previous Trading Day. • If EA2 MSP Software Run has also been cancelled, initial conditions for following EA1 and EA2 MSP Software Runs will be taken from the EA1 MSP Software Run from the previous Trading Day.

3.8 IMPACT OF CHANGES IN INTERCONNECTOR CAPACITY

In the event that there is a change to the physical capability of an Interconnector, the Code defines the process by which:

- The value of ATC is changed by the relevant System Operator and is notified to the Market Operator.
- The Market Operator recalculates the Modified Interconnector Unit Nominations and provides them to Interconnector Users.

In addition to these rules, some additional scenarios will need to be taken into account once Intra-Day trading is implemented, as detailed in sections 3.8.1 and 3.8.2.

3.8.1 REDUCTIONS IN ATC

In the event that ATC reduces under Intra-Day trading, the following will be applied:

- If ATC reduces prior to the EA1 Gate Window Closure, the revised ATC values will be submitted to the Market Operator, along with the Active Capacity Holdings (as per existing Code).
- Any reductions to ATC after the EA1 Gate Window Closure will be applied as currently, with possible adjustment of Interconnector Unit Nominations in accordance with the Code and Agreed Procedure 2 in order to determine revised Modified Interconnector Unit Nominations (MIUNs).
- Following the relevant Gate Window Closure, revised MIUNs from the EA1 and EA2 MSP Software Runs will be fixed and used in subsequent Ex-Ante MSP Software runs.

3.8.2 INCREASES IN ATC

In the event that ATC increases under Intra-Day trading, the following will be applied:

- Any increases in ATC prior to the EA1 Gate Window Closure will be submitted to the Market Operator and will be taken into account in the submission of Active Capacity Holdings. (as per existing Code).
- Any increases in ATC after the EA1 Gate Window Closure will result in revised ATC data being submitted to the Market Operator.
- The Market Operator shall recalculate MIUNs in the event that revised ATC data is received.
- Any reductions to ATC after the EA1 Gate Window Closure will be applied as currently, with possible adjustment of Interconnector Unit Nominations in accordance with the Code and Agreed Procedure 2 in order to determine revised Modified Interconnector Unit Nominations (MIUNs)⁶.
- Following the relevant Gate Window Closure, the latest MIUNs will be used in subsequent MSP Software runs as a fixed capacity allocation for Interconnector Units (taking into account changes to ATC notified and incorporated into the calculation of the latest MIUNs).

3.9 PUBLICATION AND REPORTING

⁶ Note: ATC may reduce and/or increase, with revised MIUNs being calculated based on the original IUNs calculated.

Following the implementation of additional Gate Windows to enable Intra-Day trading, various reports and publications will need to change or be published to align with the relevant MSP Software Runs.

Affected Publication / Report	EA1	EA2	WD1	Ex-Post
Daily Ex-Ante Market Schedule Detail (MP)	Y	Y	Y	
Daily Indicative Actual Schedules (MP)		Y		
Daily Within Day Actual Schedules (MP)			Y	
Daily Interconnector Modified Nominations	Y	Y	Y	
Daily Revised Interconnector Modified Nominations (MP)				Y
Daily Revised Interconnector Modified Nominations (D+4) (MP)				Y
Daily Aggregated Interconnector User Nominations	Y	Y	Y	Y
Daily Interconnector Net Actual	Y	Y	Y	Y
Daily Market Prices Averages	Y	Y	Y	Y
Daily Ex-Ante Indicative Operations Schedules Detail (PUBLIC)		Y		
Daily Revised Interconnector Modified Nominations (PUBLIC)				Y
Daily Ex-Ante Market Results	Y	Y	Y	
Daily KPI – Schedules Publication	Y	Y	Y	Y
Daily KPI – Gate Information	Y	Y	Y	
Daily Ex-Ante Indicative Shadow Price	Y	Y	Y	
Daily Interconnector Capacity Active Holdings (MP)	Y	Y	Y	
Daily Interconnector Capacity Holdings	Y	Y	Y	
Daily Ex-Ante Interconnector Nominations	Y	Y	Y	
Daily Ex-Ante Market Schedule Summary	Y	Y	Y	
Daily Ex-Ante Market Schedule Detail (Public)	Y	Y	Y	
Daily Technical Offer Data – Standard Units	Y	Y	Y	
Daily Technical Offer Data – Demand Side Units	Y	Y	Y	
Daily Technical Offer Data – Forecast Data	Y	Y	Y	
Daily Commercial Offer Data - Standard Generator Units	Y	Y	Y	
Daily Commercial Offer Data - Standard Demand Side Units	Y	Y	Y	
Daily Commercial Offer Data - Interconnector Units	Y	Y	Y	
Daily Commercial Offer Data - Generator Unit Nomination Profiles	Y	Y	Y	
Daily Commercial Offer Data – Demand Side Unit Nomination Profiles	Y	Y	Y	
Daily Generator Unit Technical Characteristics Data	Y	Y	Y	
Daily Load Forecast Summary	Y	Y	Y	
Daily Interconnector ATC Data	Y	Y	Y	
Daily Revised Interconnector ATC Data				Y
Daily Four Day Rolling Load Forecast and Assumptions	Y	Y	Y	
Daily Aggregated Four Day Rolling Load Forecast	Y	Y	Y	
Daily Rolling Wind Forecast and Assumptions	Y	Y	Y	
Daily Rolling Wind Forecast and Assumptions Aggregated Per Jurisdiction	Y	Y	Y	
Two Day Aggregated Rolling Wind Power Forecast	Y	Y	Y	
Daily Interconnector Capacity Active Holdings (PUBLIC)	Y	Y	Y	

The following publications and reports will be unaffected by the Intra-Day trading changes:

Daily	Monthly	Annual
Indicative Ex-Post Market Schedule Detail	All Generator Outage Schedules	Market Price Parameters
Ex-Post Indicative Actual Load Summary	Planned to Generator Outage Schedules	Load Forecast
Meter Data Detail (D+1), (D+3)	Generator Outage Summary	Aggregated Load Forecast
Initial Ex-Post Market Schedule Details	Transmission Outage Schedules	Transmission Loss Adjustment Factors
Initial Ex-Post Shadow Price	Transmission Outage Summary	Interconnector Capacity Holdings
Ex-Post Indicative Shadow Price	Updates to Transmission Outage Schedules	
Generator Outage Schedules	Load Forecast and Assumptions	
Ex-Post Indicative Interconnector Nominations	Aggregated Load Forecast	
Ex-Post Initial Interconnector Nominations	Interconnector Capacity Holdings	
Market Operations Notifications		
Dispatch Instructions		
Daily Trading Day Exchange Rate		

Daily	Monthly	Annual
Indicative Ex-Post Market Schedule Summary Meter Data Summary (D+1), (D+3) Indicative Ex-Post MSQ Detail (PUBLIC) Indicative Ex-Post Market Prices Initial Ex-Post Market Prices Initial Ex-Post Market Schedule Summary Initial Ex-Post MSQ Details (PUBLIC) Jurisdiction Error Supply MW Demand Control Data Transaction Energy Limited Generator Unit Technical Characteristics Data Price Affecting Meter Data Transmission Outage Schedules Ex-Post Loss of Load Probability Forecast SO System Frequency Interconnector Trades Ex-Post Indicative Market Results Ex-Post Initial Market Results Ex-Post Dispatch Quantity Ex-Post Initial Actual Load Summary Indicative Interconnector Flows Initial Interconnector Flows and Residual Capacity Monthly Loss of Load Probability Forecast Daily Unit Data		

3.10 SETTLEMENT

The key components of settlement calculations in the SEM are as follows:

	ENP (Energy Payments)	ENC (Energy Charges)	CONP (Constraint Payments)	MWP (Make Whole Payments)	UNIMP (Uninstructed Imbalances)	IMPC (Imperfections Charge)
PQ Pairs			✓	✓	✓	
No Load Costs			✓	✓		
Start Up Costs			✓	✓		
Market Schedule Quantities (MSQ)	✓		✓	✓		
Dispatch Quantities (DQ)			✓		✓	
Metered Generation (MG)					✓	
Metered Demand (MD)		✓				✓
Availability Profile						
System Marginal Prices (SMP)	✓	✓	✓	✓	✓	
Combined Loss Adjustment Factors (CLAF)	✓	✓	✓	✓	✓	

Where:

- ENP – Energy Payments
- ENC – Energy Charges
- CONP – Constraint Payments

- UNIMP – Uninstructed Imbalances
- IMPC – Imperfections Charges
- MWP – Make Whole Payments

It is expected that there will be no significant changes to any existing settlement calculations.

Note: Various changes to the Central Market Systems interfaces may be required, to ensure that that correct Commercial Offer Data and Technical Offer Data from each of EA1, EA2 and WD1 Gate Windows is available for the relevant EP1/2 Settlement Run.

3.11 CREDIT MANAGEMENT

3.11.1 CURRENT CREDIT COVER IN THE SEM

Credit Cover in the SEM is based on:

- **Invoiced:** Amounts invoiced and payment outstanding
- **Settled:** Amounts calculated but not yet invoiced
- **Estimated:** Estimated future exposure, usually based on historical data and forecasts

Credit Cover is at a Participant level, netting Credit Cover of all registered Generator Units (including Interconnector Units) and Supplier Units.

- Supplier Units purchase electricity via the SEM and therefore owe money to the SEM for each Trading Day.
- Generator Units sell electricity via the SEM and therefore are owed money by the SEM for each Trading Day.

3.11.2 CURRENT CREDIT COVER FOR INTERCONNECTOR UNITS

Interconnector Units are considered as Generator Units in the Code (and Central Market Systems). As a result, positive MW quantities for Interconnector Units indicate import to the SEM and negative MW quantities indicate export from the SEM. As a result, Credit Cover for Interconnector Units is:

- When Importing (i.e. DQ or MSQ ≥ 0), an Interconnector Unit is providing electricity to the SEM and is therefore owed money by the SEM (i.e. exposure in the SEM is negative).
- When Exporting (i.e. DQ or MSQ < 0), an Interconnector Unit is purchasing electricity from the SEM to sell elsewhere and therefore owes money to the SEM (i.e. exposure in the SEM is positive).

As Interconnector Units are considered Generator Units, the Code requires that they post only a Fixed Credit Cover amount. Additional Credit Cover is requested based on historical data, where the net position for an Interconnector User is exporting. In the event that the historical trend is not consistent (i.e. importing or exporting), the current calculation of Credit Cover can be a poor estimate of financial exposure.

The effect of this is limited under the current rules is as the export capacity from the SEM is currently 80MW. However, when EWIC is commissioned and if Moyle export capacity is increased in the future, there could be an export capacity of 1000MW. This, coupled with superposition being possible under Intra-Day trading, there could theoretically be no upper limit on export trade quantities. As a result, the existing calculations of Credit Cover for Interconnector Units are inadequate.

3.11.3 CREDIT COVER FOR INTERCONNECTOR UNITS UNDER INTRA-DAY TRADING

The proposed Credit Cover treatment of Interconnector Units would introduce a revised calculation of Required Credit Cover for Interconnector Units which will better match the exposure of the units.

Description	
Energy Market Exposure	<ul style="list-style-type: none"> • Invoiced: Amounts invoiced and payment outstanding (netted). • Settled: Amounts calculated but not yet invoiced (netted). • Traded: Amounts calculated based on traded values where not Settled (i.e. between D+1 and D+4), based on export MIUNs and PQ Pairs Accepted (export only). • Offered: The maximum export exposure (in respect of Energy Charges) is implied by a set of Price Quantity Pairs submitted to a particular Gate Window (export only).
Capacity Market Exposure	<ul style="list-style-type: none"> • Invoiced: Amounts invoiced and payment outstanding (netted). • Settled: Amounts calculated but not yet invoiced (netted). • Traded (Energy Settled): Capacity amounts calculated based on net traded volumes where Capacity is not Settled (i.e. Initial Capacity Settlement is not completed) but the Initial Energy Settlement is completed, using the forecast Capacity Payments Generation Price, CPGP (netted). • Traded (Energy Not Settled): Amounts calculated based on export traded volumes where Capacity is not Settled (i.e. where Initial Capacity Settlement has not been completed) and where Initial Energy Settlement is not complete, based on the Quantities as part of a set of Price Quantity Pairs submitted to a particular Gate Window and a forecast Capacity Payments Generation Price (export only). • Offered: The maximum exposure (in respect of Capacity Charges) as implied by the forecast Capacity Payments Generation Price and the export Quantity as part of a set of Price Quantity Pairs submitted to a particular Gate Window (export only).

Note: As Capacity Payments/Charges are settled on a monthly basis, the length of the Invoiced, Settled and Traded periods will depend on the day on which the Credit Cover calculation is performed (this is the same as the current market design).

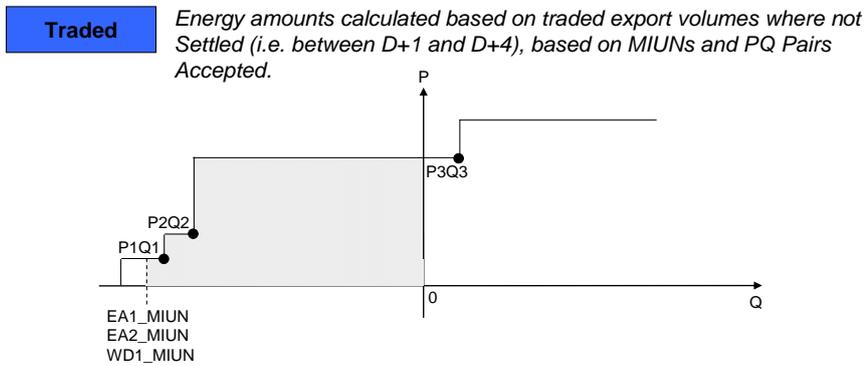
This approach ensures that the risk exposure of Interconnector Units is more accurately assessed, relying on quantities traded and the maximum exposure implied by trades offered within the SEM. As a result, Interconnector Units must have sufficient Credit Cover in place to cover their potential exposure in the market. If this is not the case, those elements of Commercial Offer Data submitted that imply exporting (e.g. all quantities below zero) will be excluded after the relevant Gate Window Closure. The Commercial Offer Data cannot be rejected on submission, as the levels of Required Credit Cover may change between submission and the relevant Gate Window Closure, when no change to Commercial Offer Data is possible.

No change is proposed to the calculation of the “Invoiced” or “Settled” components of the existing Credit Cover calculations.

3.11.3.1 CALCULATION OF “TRADED” CREDIT EXPOSURE

The “Traded” Credit exposure is based on the potential exposure indicated by completed trades, including exposure in respect of both Energy Charges (“Traded”) and Capacity Charges (“Traded (Energy Settled)” and “Traded (Energy Not Settled)”).

Energy Charges:

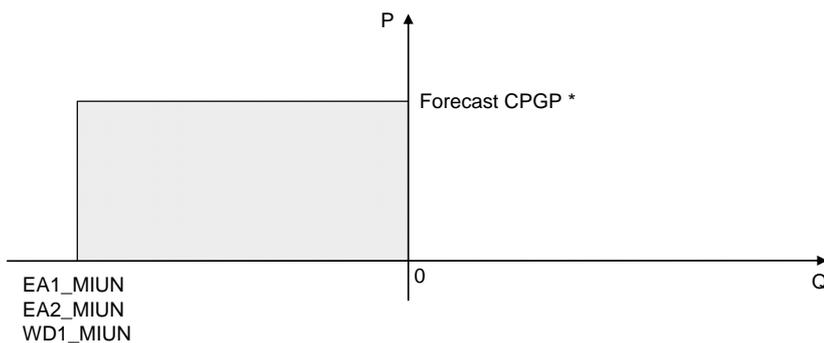
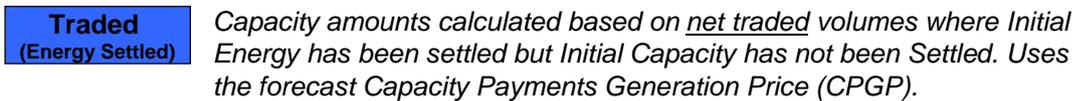


For each Trading Period in the MSP Software Runs that have been completed when the Credit Cover calculation is executed:

- Maximum Energy Market exposure is the area under the PQ curve for all values below Q=0 (i.e. exporting), up to and including the relevant MIUN (the limit for Ex-Post scheduling). This is the shaded area.

Figure 3-9: Credit Cover – Traded Energy Charges

Capacity Charges:



For each Trading Period in the MSP Software Runs that have been completed when the Credit Cover calculation is executed:

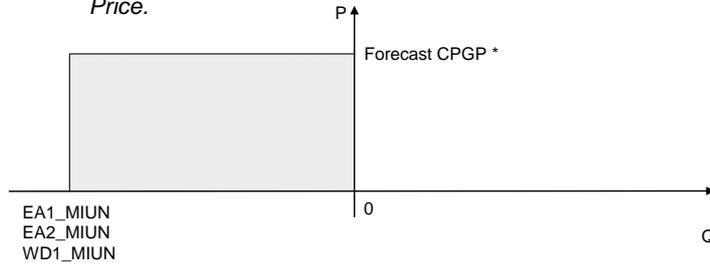
- Maximum Capacity Market exposure is based on the relevant MIUN and the forecast Capacity . This is the shaded area (which may be positive or negative).

** The forecast CPGP will be calculated in the same way the Estimated Capacity Price (ECP), based on data for the Historical Assessment Period at the 95th percentile.*

Figure 3-10: Credit Cover – Traded Capacity Charges (Energy Settled)

Traded (Energy Not Settled)

Amounts calculated based on traded export volumes (not netted) where both Initial Energy settlement and Initial Capacity settlement have not been completed. Credit Cover is based on the MIUNs allocated in EA1, EA2 and WD1 MSP Software Runs, and a forecast Capacity Payments Generation Price.



For each Trading Period in the MSP Software Runs that have been completed when the Credit Cover calculation is executed:

- The maximum “Traded (Energy Not Settled)” Capacity Market potential exposure is based on the relevant MIUN and the forecast Capacity Payments Generation Price. This is the shaded area.
- Proposed design requires Interconnector traders to have sufficient Credit Cover in place (to cover both Energy and Capacity exposure), otherwise bids implying export will be excluded following the relevant Gate Window Closure.

* The forecast CPGP will be calculated in the same way the Estimated Capacity Price (ECP), based on data for the Historical Assessment Period at the 95th percentile.

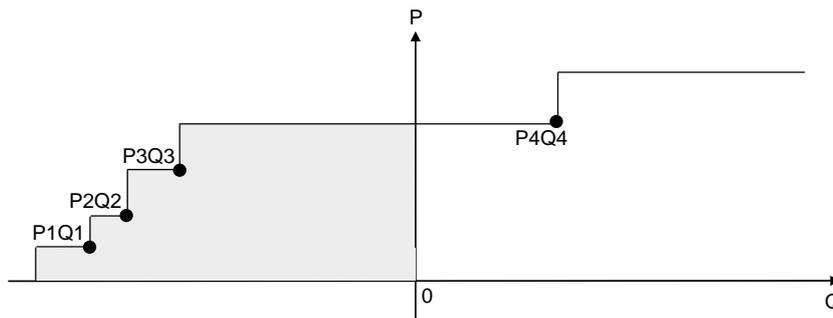
Figure 3-11: Credit Cover - Traded Capacity Charges (Energy Not Settled)

3.11.3.2 CALCULATION OF “OFFERED” CREDIT EXPOSURE

Energy Charges:

Offered

The maximum exposure implied by a set of Price Quantity Pairs submitted to a particular Gate Window (rejected after Gate Window Closure if insufficient Credit Cover in place):



Within each Ex-Ante Gate Window:

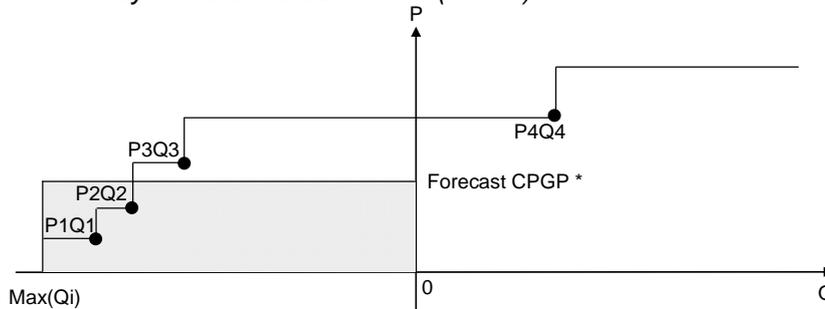
- The maximum Energy Market potential exposure is the area under the PQ curve for all values below Q=0 (i.e. exporting) This is the shaded area.
- Proposed design requires Interconnector traders to have sufficient Credit Cover in place (to cover both Energy and Capacity exposure), otherwise bids implying export will be rejected following the relevant Gate Window Closure.

Figure 3-12: Credit Cover - Offered Energy Charges

Capacity Charges:

Offered

The maximum exposure implied by the Quantities from a set of Price Quantity Pairs submitted to a particular Gate Window (rejected after Gate Window Closure if insufficient Credit Cover in place) and the forecast Capacity Payments Generation Price (CPGP):



Within each Ex-Ante Gate Window:

- The maximum Capacity Market potential exposure is the maximum export Quantity multiplied by the forecast Capacity Payments Generation Price (CPGP). This is the shaded area.
- Proposed design requires Interconnector traders to have sufficient Credit Cover in place (to cover both Energy and Capacity exposure), otherwise bids implying export will be rejected following the relevant Gate Window Closure.

* The forecast CPGP will be calculated in the same way the Estimated Capacity Price (ECP), based on data for the Historical Assessment Period at the 95th percentile.

Figure 3-13: Credit Cover - Offered Capacity Charges

3.11.3.3 CREDIT COVER REPORTING TO PARTICIPANTS

In addition to amending the calculation of Required Credit Cover and rejecting Commercial Offer Data following Gate Window Closure where insufficient Credit Cover is posted to cover the offered trades, additional Credit Cover reporting will be provided by the Market Operator⁷:

- Full Credit Cover report each day at 14:30 (as per the existing report provided at 17:00).
- Interim Credit Cover report at 11:00 each morning, which will update the Required Credit Cover from the Full Credit Cover report from the previous day with the “traded” exposure for the WD1 and EA1 MSP Software Runs.

3.12 INVOICING

No changes to the arrangements for Invoicing are expected.

3.13 FUNDS TRANSFER

No changes to the arrangements for Funds Transfer will be required.

⁷ The Detailed Design for Intra-Day Trading will consider the mechanisms by which these reports are to be provided.

4 APPENDIX A – GLOSSARY

This Glossary should be considered in the context of the existing Glossary to the Code. This section provides definitions of key terms that are of particular relevance to the Intra-Day trading high level design. This Glossary does not define the entire set of terms (new or existing) referenced in this document or those that will be required in the revised Code; instead, it intends to provide context to key terms used in this document.

- Terms and definitions in plain text are new (i.e. are not currently defined in the Code) or will require amendment under Intra-Day trading.
- Terms and definitions in *italics* are from the current Code (noting that some definitions have been changed to apply to Intra-Day trading).

Term	Definition
<i>Accepted</i>	<i>means, in relation to data submitted by a Participant, that data which the Market Operator is required to use under Section 3 of the Code either because (i) it is the most recently received Validated Data Transaction and is consistent with the appropriate Gate Closure or (ii) the Market Operator is required to use Default Data in accordance with Section 3.</i>
<i>Available Transfer Capacity (ATC)</i>	<i>means the available transfer capacity (consisting of the Maximum Export Available Transfer Capacity and the Maximum Import Available Transfer Capacity) for each Interconnector.</i>
<i>Central Market Systems (CMS)</i>	<i>Means the IT systems within the control of the Market Operator used to meet its obligations under the Code (including without limitation bid/offer acceptance, MSP Software, Settlement, invoicing, funds transfer and credit assessment).</i>
<i>Default Data</i>	<i>means the standing Commercial Offer Data and Technical Offer Data provided by a Participant on registration of each of its Units, but not Interconnector Units, as updated from time to time in accordance with the Code.</i>
<i>Ending Overlap Optimisation Period</i>	<i>means a contiguous group of Trading Periods as part of a particular Optimisation Time Horizon which falls after the associated Trading Window.</i>
Gate Window	means a period of time within which Data Transactions may be submitted and Accepted for use in the associated MSP Software Run.
Gate Window Closure	means the time prior to which Data Transactions may be submitted and Accepted for use in the associated MSP Software Run.
Gate Window Opening	means the time after which Data Transactions may be submitted and Accepted for use in the associated MSP Software Run.
<i>Interconnector Unit</i>	<i>means a Unit registered by an Interconnector User associated with the relevant Interconnector.</i>
<i>Interconnector Unit Nominations</i>	<i>means a quantity nominated for import or export for an Interconnector Unit as calculated within the Ex-Ante Indicative Market Schedule.</i>

Term	Definition
<i>Maximum Export ATC (MEATC)</i>	<i>means the available transfer capacity for exporting in respect of an Interconnector.</i>
<i>Maximum Import ATC (MIATC)</i>	<i>means the available transfer capacity for importing in respect of an Interconnector.</i>
<i>Modified Interconnector Unit Nominations (MIUNs)</i>	<i>means for each Interconnector Unit in each Trading Period, a value expressed in MW which is calculated as defined in the Trading and Settlement Code.</i>
<i>Optimisation Time Horizon</i>	<i>means a contiguous group of Trading Periods over which an MSP Software Run applies.</i>
<i>Starting Gate Window Data</i>	<i>means a set of data that is populated within a Gate Window by the Market Operator at start of the relevant Gate Window.</i>
<i>Starting Overlap Optimisation Period</i>	<i>means a contiguous group of Trading Periods as part of a particular Optimisation Time Horizon which fall prior to the associated Trading Window.</i>
<i>Superposition</i>	<i>means the mechanism which ensures that the net flow on an Interconnector must not exceed the physical capacity, yet allows trading in excess of the physical limits on flows of energy.</i>
<i>Trading Day</i>	<i>means the period commencing at 06:00 each day and ending at 06:00 the next day.</i>
<i>Trading Day Exchange Rate</i>	<i>means the exchange rate between pounds sterling and euro for the next Trading Day set at 08:00 the day before the Trading Day.</i>
<i>Trading Period</i>	<i>means a thirty minute period beginning on each hour or half-hour.</i>
<i>Trading Window</i>	<i>means the contiguous number of Trading Periods, excluding the Starting Overlap Optimisation Period and Ending Overlap Optimisation Period, for which the relevant MSP Software Run will determine Market Schedule Quantities..</i>
<i>Validation Technical Offer Data (VTOD)</i>	<i>means certain Technical Offer Data items, as set out in Appendix I "Offer Data" in respect of a Generator Unit that are validated by the Market Operator against the Primary Data Set and the Alternative Data Set.</i>

5 APPENDIX B - KEY TIMINGS

Note 1: the following times will be adjusted by Day Light Saving Conditions as appropriate.

Note 2:

Appendix C - Configurability contains details of the configurability of key events/timings with the Central Market Systems.

	EA1	EA2	WD1
Gate Windows			
Gate Window Opening	10:00 on TD-29	09:30 on TD-1	11:30 on TD-1
Gate Window Closure	09:30 on TD-1	11:30 on TD-1	08:00 on TD
Trading Windows			
Start of Trading Window	Start of Trading Day (Trading Period starting 06:00)	Start of Trading Day (Trading Period starting 06:00)	Trading Period starting 18:00
End of Trading Window	End of Trading Day (Trading Period starting 05:30)	End of Trading Day (Trading Period starting 05:30)	End of Trading Day (Trading Period starting 05:30)
Optimisation Time Horizons			
Start of Optimisation Time Horizon	Start of Trading Day (Trading Period starting 06:00)	Start of Trading Day (Trading Period starting 06:00)	Start of Trading Day (Trading Period starting 06:00)
End of Optimisation Time Horizon	Trading Period starting 11:30 following end of Trading Day	Trading Period starting 11:30 following end of Trading Day	Trading Period starting 11:30 following end of Trading Day
Starting Overlap Optimisation Period			
Start of Starting Overlap Optimisation Period	N/A	N/A	Start of Trading Day (Trading Period starting 06:00)
End of Starting Overlap Optimisation Period	N/A	N/A	Trading Period immediately prior to start of Trading Window
Ending Overlap Optimisation Period			
Start of Ending Overlap Optimisation Period	Trading Period starting 06:00 following end of Trading Day	Trading Period starting 06:00 following end of Trading Day	Trading Period starting 06:00 following end of Trading Day
End of Ending Overlap Optimisation Period	Trading Period starting 11:30 following end of Trading Day	Trading Period starting 11:30 following end of Trading Day	Trading Period starting 11:30 following end of Trading Day
VTOD Set Selection Gate Closure			
VTOD Set Selection Gate Closure	10 minutes prior to EA1 Gate Window Closure	10 minutes prior to EA2 Gate Window Closure	N/A ⁸

⁸ VTOD set selection may not be submitted within the WD1 Gate Window.

6 APPENDIX C - CONFIGURABILITY

In order to support the delivery of future changes in the SEM, SEMO is seeking to implement an appropriate level of configurability. The degree of configurability that is achievable is being progressed with the CMS vendor, but could include configuration of:

- Gate Windows
- Trading Windows (particularly of the WD1 Trading Window)
- Optimisation Time Horizons

The exact nature of the configurability to be implemented cannot be confirmed at this time. Instead, this will be progressed by SEMO with the CMS vendor as part of the Detailed Design process.