Market System Development Plan Final

1st January 2024 – 31st December 2025

Abstract

This document outlines the proposed projects planned to be undertaken by SEMO for the period between 1 January 2024 and 31 December 2025.

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1 Introduction

SONI and EirGrid, in their respective capacity as licenced Market Operator in Northern Ireland and Ireland respectively (together the Single Electricity Market Operator 'SEMO'), are required to produce a Market System Development Plan (MSDP) for approval by the Utility Regulator (UR) and the Commission for Regulation of Utilities (CRU) for the development of the Single Electricity Market (SEM) Trading and Settlement System. This plan is produced in accordance with Condition 16 of the SONI SEM Operator Licence and in accordance with Condition 4 of the EirGrid Market Operator License.

This document is the MSDP developed by SEMO for the period from 1st January 2024 to 31st December 2025. It identifies predominantly the market facing changes that SEMO believes will facilitate the effective operation, administration, and development of the SEM, that impact on the SEMO systems, and proposes what investment projects are essential to support the needs of the market.

There are currently a number of factors that will influence where SEMO's expenditure is focused in the coming years in order to facilitate the efficient, economic, and coordinated operation, administration, and development of the SEM in a financially secure manner. SEMO will need to accommodate and adhere to the direction received from the Regulatory Authorities (the CRU and the UR, hereafter the RAs), any obligation under European Commission directives/legislation, and feedback SEMO receives from participants. This is in addition to ensuring the longer-term goal of ensuring SEMO can facilitate the challenges of high renewable energy share in electricity (RES-E) required to achieve the 2030 decarbonisation targets.

SEM Committee decisions Pursuant to Regulation (EU) 2019/943 in relation to dispatch and redispatch, and the level of change required over the coming years to ensure that revised arrangements at the SEM/GB border are implemented alongside EU re-integration requirements, have potential significant impacts on SEMO. The introduction of new technologies within the market, as well as measures to mitigate the higher than usual prices that energy market is experiencing, will impact the current and future environment.

SEMO's ability to advance projects noted in the MSDP is dependent on sufficient revenues having been approved by the RAs, where required, timely RA decisions and the feedback from industry as part of any project specific consultations. The upcoming SEMO Price Control (PC) for the period 2024 to 2029 will be a key enabler in this regard.

In Section 2, this document provides background information regarding projects that are currently in implementation. This includes the projects that SEMO is committed to the delivery of and the defects and Known Issues that have been committed to a specific market release. Section 3 then provides information on future projects and the Known Issues that have not yet been committed into a specific market release.

There are a number of competing challenges and limitations to the delivery of major projects which mean that not all potential projects can be simultaneously delivered during the period in question.

These include the challenges faced by the industry, the regulatory environment, and the capability of vendors and market systems. SEMO's priorities and capability to coordinate major changes and adapt processes, and participants' priorities and their capability to keep pace with the level of change required are challenges that SEMO will face. SEMO will strive to consider all these factors as appropriate in order to achieve its core objectives.

2 Projects In Implementation

2.1 Market System Release

The central market systems are updated twice per year, typically with a spring and autumn release. A number of change requests, Known Issues and defect fixes are included in each market release. Change requests can be a result of modifications to the Trading and Settlement Code, accommodating changes in other markets timeframes (such as ex-ante) or improvements to market functionality.

The rate at which system changes can be assessed and implemented continues to be challenging in the context of the complexity of Change Requests. For example, those affecting multiple market systems, and the large volume of Defects, Known Issues and Change Requests backlog which is being worked through. Therefore, prioritisation is required, and in each release, there will be a certain capacity available for changes to each of the different parts of the market systems, so multiple Change Requests affecting the same part of the systems, e.g. settlement, have to be prioritised. In this context it is necessary that particularly important or high materiality system changes to implement rule changes are given the necessary priority to ensure that their delivery is appropriately expedited, within the confines of what is practically achievable.

2.2 Change Requests

These Change Requests for Year 1 represent a committed schedule of changes which should go-live provided that implementation and testing is successful. More detail on these Change Requests below and those to be scheduled for future releases can be found in Appendix 1 and 2 respectively.

Market Management System Release M

Release M will include a number of changes, including those necessary for the Greenlink interconnector and will be tested in Spring 2024. The deployment date may be influenced by factors such as Greenlink deployment requirements. The details of the individual changes included in this release are outlined below:

CR 212 CSB/MI Value Import Screen Change

A dashboard summary screen should be made available to allow users to quickly identify the number of procedures with records processed against them. Due to the variety of data sources in the system, it can be difficult to ascertain what has come through and what is missing.

CR 301 Issuing audio alarms for any failing MMS applications

The MMS consists of several applications and each application has several alarms which can be issued for information, warning or error depending on the conditions of the alarm. Failure to notify Grid Controllers in a timely manner could have a subsequent impact of downstream applications. This change is requested to add Audible alarms in the MMS to notify the Grid Controller if any of the applications, Scheduling, RT Imbalance Pricing, Data Management have failed or stopped running for any reason.

CR 303A Greenlink: Registration, Market Information and Market Participant

The purpose of this Change Request is to request the necessary Market Information and Market Participant Interface changes within the HE MMS Platform to enable the registration, reporting, and general operation of the new interconnector (Greenlink) within the ROI jurisdiction, in line with that of the existing Moyle and EWIC interconnectors.

CR 303B Greenlink: Market Application changes required for Greenlink
This introduces functionality allowing for the inclusion of Greenlink within the SEM Balancing and Capacity Markets. Specifically, it has changes to support scheduling, imbalance pricing, instruction profiling and general operation of Greenlink.

CR 304 Treatment for Firm Curtailment (Part of SEM 22 009 decision CEP Article 13.7)
This change is requested as part of the Clean Energy for all Europeans package (CEP). Among these acts is the revised Regulation on the internal market for electricity (EU) 2019/943 which seeks to amend aspects of wholesale electricity markets in Europe.

This Change Request aims to provide for implementation of the element of this decision related to the retention of ex-ante market revenues for firm curtailment going forward from the required implementation date. Note the functionality delivered by this Change Request will be switched off once implemented, until further notice.

Market Management System Release N

Release N will include a number of changes, primarily the first tranche of MMS changes for the Schedule and Dispatch programme as set out in Table 1 below. A number of these initiatives relate to how the system is scheduled and dispatched, and in conjunction with the related changes required to support compliance with the CEP have been grouped together into the Scheduling & Dispatch Programme (SDP). Release N is expected to go live in April 2025.

Release N Change Request Scope
SDP_01 Operation of Non-Priority Dispatch of Renewables
Ability to register and submit offer data for Non-Priority Dispatch Renewable Units
Ability to schedule and dispatch Non-Priority Dispatch Renewable Units individually
Ability to include Non-Priority Dispatch Renewable Units in balancing market pricing
Ability to settle Non-Priority Dispatch Renewable Units
Ability to report on scheduling/dispatch of Non-Priority Dispatch Renewable Units
SDP_02 Energy Storage Power System Integration requirements
Ability to register and submit data (MP & Operational) for Energy Storage Power Station Units
Ability to schedule and dispatch Energy Storage Power Station Units
Ability to include Energy Storage Power Station Units in balancing market pricing
Ability to settle Energy Storage Power Station Units
Ability to report on scheduling/dispatch of Energy Storage Power Station Units

Table 1 - Change Requests that have a Planned Resolution in a specific market release.

2.3 Defect Fixes and Known Issues

As the market systems continue to mature, the baseline number of defects continues on a downward trajectory. However, the complexity of the residual defects and therefore the effort to resolve are higher and we expect this trend, both in terms of complexity and effort, to continue in the short-term. Due to the complexity of certain defects, and the prioritisation of projects going forward, the defects haven't been committed to a certain market system release. The business has defects in analysis with the vendors which are being planned for resolution[1].

There are 9 defects planned for Release M, 3 of these are on the Known Issues Report as per the latest Known Issues Report at the time of publication. The defects that are on the Known Issues Report include Incorrect BOAs caused by PCON pseudo instruction, Incorrect QBOA due to soak / dwell times and Issue when a unit switches from Non-controllable to Controllable. Table 2 below shows the defects and Known Issues that have been planned for Release M.

Release M Defect Scope			
Defect Name	**Business Owner**	**Status**	**Known Issues**
CSU Defect when there are multiple startups in a settlement imbalance period.	Settlement	Release M	No
Defect - Configuration of Perl Scripts for CSB Credit Events is not calling correct function in CSB	Settlement	Release M	No
MMS: Incorrect Application of Non-Marginal Flags	Trading / Pricing	Release M	No
Defect for INT_97 submission using Standing Bid	General	Release M	No
MMS: Inefficient SQL	General	Release M	No
Interconnector CTEST Queries - CSB query	Settlement	Release M	No
Incorrect BOAs caused by PCON pseudo instruction.	Settlement	Release M	Yes
Incorrect QBOA due to soak / dwell times	Settlement	Release M	Yes

[1] Note: For Clarity to Industry, the warranty for the resolution of defects in the Central Market System expired 12 months after Go-Live and consequently defect resolution is now a chargeable activity. Therefore, cost associated with fixes will now be a feature of the relevant price controls.

Issue when a unit switches from Non-controllable to Controllable.	Settlement	Release M	Yes

Table 2 - Defects that have a Planned Resolution in Release M

Section 3.1 SEMO Known Issues Reporting includes information on the Known Issues that have not yet been resolved or are not yet planned for resolution in a specific market release.

2.4 Predictable CapEx Projects

Four Predictable Capex projects were identified as being necessary projects in the price control decision SEM-21-073. Table 3 below provides an update on the progress for each of the four projects:

Predictable CapEx Projects	
Project Name	**Progress description**
SEM Infrastructure Refresh	The core MMS will remain in the data centres and therefore infrastructure refresh is required to ensure the Market Systems always remain available and supported by SEMO's infrastructure suppliers. As such a number of projects are progressing to refresh the SEM infrastructure, including • **Network Security Baseline**: This project is now complete. • **SEM VMWare upgrade**: Phase 1 of the project is now complete. Phase 2 to be delivered by Q4. • **CPLEX upgrade**: Testing underway. Expected to be delivered in the next SEMO PC period. • **F5 Replacement**: Belfast devices configured and market running out of Belfast using the new devices. Dublin devices configured and OMW running out of new devices, Dublin devices to be unracked and decommissioned following switchover into the new devices Feb 2024. • **Disk Storage and Servers for SEM Lab**: This project is now complete. • **System Hardware delivered for Database refresh**: This project is now complete. • **CSB DB Separation**: This project is now complete. • **MMS DB upgrade for SEM**: Related to Oracle v19c which was delivered in Q2 2023. • **Market SAN replacement**: This will be delivered as part of the SEM VMware project first for the DMZ in Q1 2024. This needs planning for the remainder of the SEM market, proposed as a part of SEM VMWare upgrade for remainder up to Q4 2024. The migration to the new SAN will

	be as the existing hardware is brought online as the new hardware will be connected to the new Market SAN.
SEMO Finance System / ERP	The SEMO Finance System is due to be upgraded to D365. The initial design phase commended in December 2023. The first stage will be underway in 2024. Expected to be complete in 2025 and is included in new SEMO Price Control.. This is required to ensure SEMO stay on a secure and supported Finance solution.
Automated Test Capability	The aim of the project is to increase the operational efficiencies of the I-SEM test team by automating repetitive tasks and produce an automation strategy that will provide clarity on how future automation projects will be approached holistically and provide a framework on how automation will be used across EirGrid. The Server changes and the Tool (Katalon) along with the Automation Scripts have been delivered and are in operational use. The Automation Strategy document is in progress. This project is now complete
SEMO Website Development	This project is to deliver changes required to upgrade the SEMO Website Content Management System. Additionally, the scope of the project will include functional changes requested for SEM-O website historic information and enhanced reporting capabilities. There will be progress made on the website development in 2024.. The SEMO Website will undergo further development as part of the Digital Strategy for the new SEMO Price Control.

Table 3 - Predictable CapEx Projects

2.5 Unpredictable CapEx Projects

SEMO was provided an allowance for unpredictable CAPEX in SEM-21-073. A number of critical initiatives are being delivered as part of this allowance. The detail of each project and the progress to date is shown in Table 4 below:

Unpredictable CapEx Projects	
Project Name	**Progress description**
Cloud Adoption - SharePoint Online Migration & Azure landing Zone	Cloud-hosting of commodity software systems at SEMO is a means of delivering evolving IT solutions more quickly and operating them more cost-effectively. This programme includes many projects to be delivered as part of the EirGrid Group IT Strategy, including SEMO. Key Projects in next 2 years and progress to date: • SharePoint Online Migration:

	○ The migration to SharePoint Online is a key element of our Digital Programme and paves the way to deliver an integrated cloud-based productivity and collaboration suite. The overall SharePoint Online project is a complex, multi-year programme and delivers a web-based collaborative platform that integrates with Microsoft 365. It involves the delivery of the platform, the migration of all relevant corporate documentation and the rebuild of existing end user functionality through the integration with Microsoft's Power Platform. The key goal of this project is to Stand Up and Migrate from our On Premise SharePoint farm to our SharePoint Online instance resulting in the eventual retirement in full of our existing On Premise SharePoint environment. ○ The discovery phase and analysis for one directorate will be completed in FY 23/24. The migration of all SEMO IT and HR SharePoint sites, data and customisations will be completed by end FY 23/24, followed by other SEMO documentation in FY 24/25 and retirement of our existing On Premise SharePoint environment. Business Change and Communications associated with the migration will be ongoing throughout the programme. • Azure Landing Zone: ○ EirGrid group has an ambition to become a Digital central organisation with Cloud enabled infrastructure at its core. Microsoft's Azure environment is one of the cornerstone technologies we will invest in as part of our journey to the Cloud. ○ EirGrid group have established full diverse connectivity to Azure from their Data Centres and their Landing Zone. SEMO Data is now being transferred and feeding the Enterprise Data Hub. Further work is occurring within the Landing Zone to ensure that any workloads in Azure feed the EirGrid Security Stack and are fully monitored and controlled. By the end of 2024, we anticipate having Azure workloads and further SEMO Data available to the business as we mature our cloud presence.
Enterprise Data Hub	In line with EirGrid's agreed IT and Data & Analytics Strategy, an Enterprise Scale Data Hub is required to permit the collation of multiple data sources, the building of an Enterprise Data Model, the deployment of Analytical Tools and the Visualisation of large amounts of data. This project will build the core Infrastructure required while leveraging our Digital Foundations by deploying this hub within our new Public Cloud offering (Microsoft Azure). A cloud-based Enterprise Data Hub has been delivered for SEMO. This marks the completion of a significant milestone in our data strategy and lays the foundation for deployment of MO Use Cases. The first Use Case (Market Anomaly Monitoring) Proof of Value and associated Enterprise Data Model has been delivered to the Enterprise Data Hub and SEMO are using the reports in earnest. Advanced Analytics use case utilising business rules for automated anomaly detection completed. It is intended to commence Phase 2 to deliver further use cases in FY 23/24.

Cyber Security	The Cyber threat environment is evolving, and as such EirGrid Group must continue to progress Cyber maturity levels. This programme is delivering a significant number of group wide projects critical to maintaining a secure and resilient environment. Ongoing compliance to cyber security standards is a core obligation to SEMO's customers as a provider of critical infrastructure, which SEMO has always considered seriously. In recent years the threat level has risen and, in particular, the targeting of utility companies has emerged. SEMO's assets therefore require routine protection and continuous investment in physical and software-based security measures in order to maintain a baseline level of defence in the continually evolving and highly complex area of Cyber Security.
Oracle Middleware Upgrade	Oracle Middleware ("OMW") is an integral part of the SEM system landscape. It supports 59 out of the 91 data interfaces, providing capability for data transformation, monitoring, and error logging. It is critical that the appropriate level of support and maintenance of this platform is in place to ensure the highest level of performance of the OMW solution. As such an upgrade of OMW has been completed.
Market System Data Storage & Archiving	The SEM market consists of 2 databases: Market Management System (MMS) database and the Clearing, Settlement and Billing (CSB) database. These databases have grown in terms of the number of data records over time since market commencement on 01-Oct-2018 and will continue to do so over the coming years. There are obligations on SEMO to retain and have access to all of the market data in a timely manner. In addition, providing access to the SEM Market Archive will support future use cases (reporting, formal market queries, etc), eliminating the need for ad-hoc access to the production operational databases. This project will establish a solution to handle the requirement to provide a new archive facility, which will contain all SEM historical data and which can be accessed for several use cases covering Business usage (e.g.: legal, regulatory, audit) and downstream data feeds. It will act as a read-only repository for making all SEM historical and near real-time market data available, and is to ensure there is a record of all market data from Go-Live to date, with no data loss as mandated by T&SC. The separation of the CSB database from MMS is complete. The archiving solution is yet to completed. There is a project underway which will review the archiving requirements before moving into implementation. It's likely this solution will be delivered in FY25.

Table 4 – Unpredictable CapEx Projects

3 Future Pipeline Projects

3.1 SEMO Known Issues Reporting

This section includes information regarding the Known Issues that have not yet been resolved or planned for resolution in a specific market release and the impact to market participants of these issues.

Figure 1 below shows the amount of Open Known Issues from October 2022 to October 2023, which highlights the number of Open Known Issues over the last year for both the Balancing Market and Settlement.

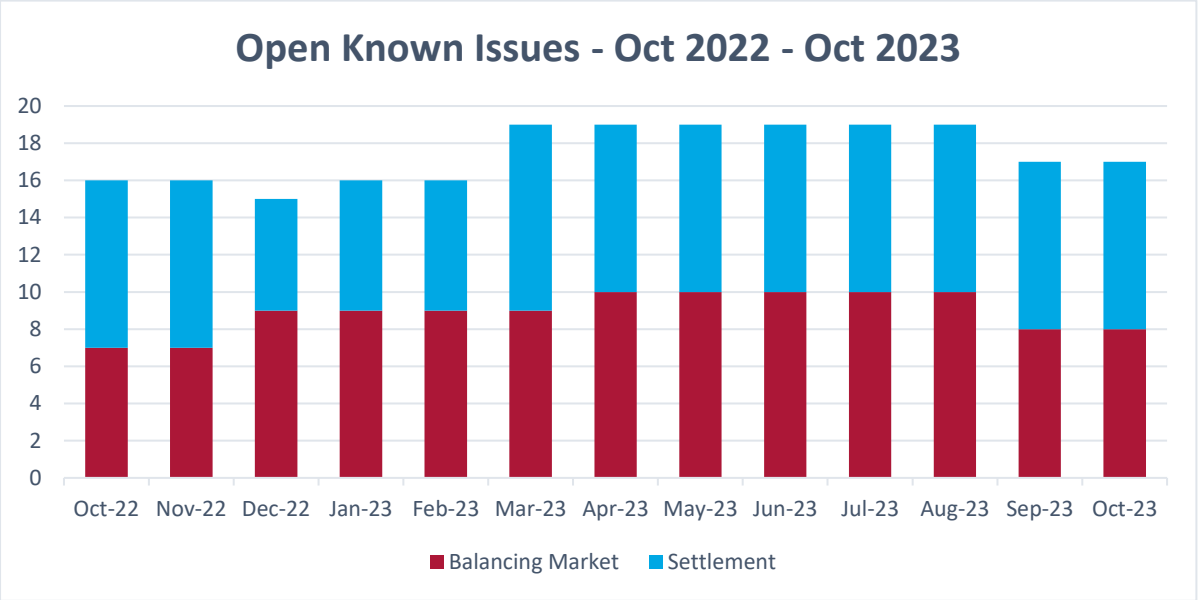

Figure 1 - Open Known Issues as of October 2022.

Table 5 and 6 below includes the Known Issues that have not yet been committed to in a specific market release at the time of publication. SEMO welcomes any feedback on the below Known Issues on the necessity to provide a system-based resolution for items not already committed to in a specific market release. These Known Issues are to be considered for prioritisation holistically alongside the future pipeline projects listed in Section 3.3, bearing in mind the challenges and limitations for delivering all projects. SEMO will take the feedback received on board when making key decisions regarding the future market design and prioritisation of projects going forward. Further description of all of these Known Issues can be found in the Known Issues Reports under General Publications on the SEMO website at the following filtered link.

Balancing Market		
Name	**Impact to Participants**	**Status**
REPT_082	May cause issues for Market Participants that are validating against PUB_DailyRegisteredUnits	Partially Resolved

SO Trade Volumes	The Net Imbalance Volume will be incorrect for Imbalance Pricing Periods where the SO Trade Volume has not fed into the calculation.	In Analysis
Incorrect application of PBOA in Imbalance Pricing for Pump Storage Units.	Incorrect PBOA values being applied, resulting in impact to Imbalance Price. Note: A workaround is currently under consideration.	Partially Resolved
Long Notice Adjustment Factor (LNAF) and System Imbalance Flattening Factor (SIFF) – Parameter defect in the Scheduling Process.	Currently there is no impact on market participants as the parameters are set to zero as agreed with the regulators and have no effect on the scheduling process.	In Analysis
Soak Time at Minimum Stable Generation Not Being Profiled	Limited impact, only one unit with TOD that meets this criteria; all other units have Soak Time Quantities less than Minimum Stable Generation.	In Analysis
Incorrect application of PSYI Internal Pseudo Instruction in closing SYNC Profile.	May result in incorrect QBOA profiles, in the scenario where a MWOF has been issued greater than Minimum Stable Generation before SYNC profile has closed.	In Analysis
Incorrect Heat State Application in Imbalance Pricing	May result in incorrect QBOA profile if unit has not reached Minimum Stable Generation.	In Analysis
Type 3 download issue impacting Pub_DailyLoadFcst Report from the MPI.	The report is available to download directly from SEMO Website.	In Analysis

Table 5 - Known Issues Report Balancing Market projects which have not yet been committed to in a specific market release

SEMO Settlement		
Name	**Impact to Participants**	**Status**
Incorrect DQ calculation for	I/C BOA volumes may be incorrect in a small specific number of scenarios affecting BALIMB Settlement amounts	Partially Resolved

Interconnectors, feeding to settlement		
CRM Unit Capacity values being knocked off following Reg import due to overlapping date ranges	Where the CRM unit capacity was replaced with a zero due to overlapping dates, Capacity payments will not have been calculated due to missing qCCOMMISS value	In Analysis
Incorrect Instruction Profile created	BOA volumes may be incorrect in a small specific number of scenarios affecting BALIMB Settlement amounts	In Analysis
Process does not allow TOD to change	No effect on BALIMB settlement amounts to date	In Analysis
QBOA for Wind Units	This has resulted in incorrect QBOA in specific circumstances	In Analysis
Incorrect Loss factor for QCNET Calculation	Incorrect loss factor applied to CAU during high price events	In Analysis

Table 6 - Known Issues Report Settlement projects which have not yet been committed to in a specific market release

3.2 Programme and Project Phasing

As part of our ongoing commitment to operational excellence and transparency, we continuously refine our project and programme management methodologies, particularly for inclusion in this submission. Recognising the importance of alignment and consistency, we are standardising our approach to outline programmes and projects. This unified framework aims to establish clearer communication and better alignment between our organisation, the SEMC and Regulatory Authorities, fostering a shared understanding of our initiatives.

We understand that certain initiatives may deviate from this framework due to unique characteristics (e.g. type of deliverables, delivery models) and specific needs. Thus, while we aim for a standardised approach, we allow for flexibility to effectively cater to individual project requirements while maintaining alignment with outcomes, regulatory standards, and expectations.

Furthermore, we recognise the interdependence between our project phases and the need for ongoing regulatory input and decisions. We emphasise collaboration and expect to engage with regulatory bodies to ensure alignment and compliance throughout project lifecycles.

Outlined below is a summary of the different phases within the framework and the typical outcomes that would be expected.

Figure 2 - Programme and Project Phases

Phase 0 – Initiation

The purpose of the Project Initiation phase is to determine why the programme has been established, and what business value it will deliver. It offers a structured approach to demonstrate the programme's business case and prove the feasibility of the project.

Phase 1 – Analysis & Planning:

The purpose of this phase is to expand upon the requirement needs and begin the planning of the programme or project. A plan is created by analysing the scope, building a high-level delivery plan, gathering high-level requirements, and performing an impact assessment against current capabilities / system landscape to determine the feasibility of the programme / project.

Phase 2 – Requirements and Design

The overall purpose of the phase is to define and document the detailed functional and non-functional requirements and design a solution that meets those requirements. This phase serves as a bridge between the initial concept or idea and the actual development or implementation of the programme, preparing a suite of deliverables in sufficient detail to enable execution.

Phase 3 - Execution

The purpose of this phase is to develop and/or implement the Products, Systems or Services to deliver upon the detailed requirements as set out in the previous phase and the programme objectives.

Phase 4 - Acceptance and Close

The purpose of this phase is to ensure that the programme or project remains sustainable, achieves its outcomes, and continues to deliver value as it transitions from the execution phase through to operational business as usual.

SEMO's ability to move a project through the various stages is dependent on sufficient revenues having been approved by the RAs, where required, timely RA decisions and the feedback from industry as part of any project specific consultations.

3.3 Future Projects

All future projects are currently at Phase 1 or early-stage Phase 1. Some of these projects are pending a regulatory direction and/or approval of funding. Engagement for these projects is underway and is subject to the decision of the upcoming SEMO PC / All Island Project Framework, as applicable. This includes but is not limited to:

3.3.1 Scheduling & Dispatch Programme (SDP)

A Scheduling and Dispatch programme has commenced to enhance and improve the technology and capability of scheduling and dispatch in Ireland and Northern Ireland. This is driven by market

participant needs, the EU Clean Energy Package mandates (Article. 12, 13.1-13.6), and in support of the broader goals of renewables (e.g. 80% RES-E) and System Non Synchronous Penetration (SNSP) penetration targets.

Key Benefits of Scheduling and Dispatch Programme:

EU Regulations outlined in the Clean Energy Package mandate that both System and Market Operators make changes to support the wider policy objectives. The status quo is not compliant. The SEM Committee has included the project in its Forward Work Plan. Failure to deliver will negatively impact the industry's commercial expectations resulting in an increase in the Cost of Capital for RES investments. At worse it could stop investment altogether.

- Compliance with aspects of CEP Art. 12 and 13 and related SEMC decisions
- Enhanced integration of low/zero carbon technologies into the S&D process
- Increasing certainty for investors which should enable increased RES-E penetration
- More equitable dispatching of wind/solar allocation of curtailment/constraint given changing weather patterns

Scope or Anticipated Activities:

The Scheduling & Dispatch programme has scope and capabilities across both TSO and SEMO responsibilities and is intended to be delivered across two releases. Specifically for SEMO, key scope items that are planned for the first release include:

• the treatment of non-priority dispatch renewable generation, and
• Energy Storage Power Station (ESPS) capability

The programme has been delivering detailed requirements for system changes and are presently working on the detailed design. Trading and settlement code modifications are currently being proposed in parallel to these activities.

Funding for this project was approved by the All-Island Programme sub-committee on 29 February 2024. The SDP programme is expected to go live in April 2025.

3.3.2 Strategic Market Programme (SMP)

The recoupling of the SEM with the wider European integrated energy market triggers the need for aspects of the EU market framework, previously deferred or on hold under the SEM as not fully applicable due to Brexit, to be implemented to ensure full compliance with the electricity market network codes. Both Ireland and Northern Ireland are mandated to implement wholesale market arrangements in line with the EU frameworks; Ireland as an EU member state and Northern Ireland, per the terms of the Northern Ireland Protocol[2]. In addition, under the Trade and Cooperation Agreement (TCA) between GB and the EU, new arrangements will be required for day-ahead capacity allocation and capacity calculation.

[2] The Northern Ireland Protocol sets out that relevant elements of European law still apply to wholesale market arrangements and requires among others that the aspects of Regulation (EU) 2019/943 related to wholesale market arrangements covered by the SEM have direct effect. Current and future network codes are also covered by this too.

In 2021, EirGrid and SONI undertook the Shaping Our Electricity Future (SOEF) consultation with the aim of developing a roadmap to deliver on Ireland's and Northern Ireland's renewable targets up to 2030. Within this roadmap, the key market design changes needed to deliver on our obligations were set out as part of the Pillar 2 suite of projects, under the three broad categories; Full integration into EU; Post Brexit Trading Arrangements; and Balancing Market Updates.

As part of the SOEF consultation[3] EirGrid and SONI received comments on the importance of timely alignment with European regulation to provide industry with foresight regarding European alignment. In addition, engagement with market participants has been undertaken regarding some elements of integration with EU operational activities (SDAC/SIDC). Feedback received as part of same included a number of requests from respondents to begin the engagement with industry on the scope and timelines for the wider SEM-EU and SEM-GB Integration programme of works so that they could provide their views and plan within their own businesses for the raft of changes required in the coming years.

Building on this consultation and feedback the Strategic Markets Programme (SMP) was initiated in 2023 by EirGrid and SONI to address a number of European and regulatory requirements that will impact the design and operation of the all-island SEM. This is currently a proposal from EirGrid and SONI and this approach is yet to be considered by the RAs.

The SMP is intended to focus on those items to be delivered in the 2026 timeframe, when the SEM will physically be recoupled with the pan EU market, those required on the SEM-GB border to ensure the benefits of the SEM-GB interconnectors are realised and to understand the longer-term evolution of the Balancing Markets post this timeframe across three broad areas:

- Full integration into EU (SEM-EU): Full integration into EU forwards, day-ahead, intraday, and balancing markets required by the recoupling of the SEM with the EU markets. This involves the full implementation of the requirements of EU Regulations on FCA, CACM, and GLEB.
- Post Brexit Trading Arrangements (SEM-GB): Ensure SEM – GB trading arrangements are fit for purpose, in light of increasing interconnection with GB and any policy developments between the EU and GB. This will take account of the requirements of the TCA between the European Union and the European Atomic Energy Community, of the one part, and the United Kingdom of Great Britain and Northern Ireland, of the other part, and the Northern Ireland Protocol. This needs to be assessed in parallel with the SEM-EU work package, to ensure no undesirable outcomes.
- Balancing Market Updates: To take account of new and emerging technologies and policy developments to enable integration of higher levels of RES and more efficient trading arrangements. This will take account of the requirements set out in key articles of the CEP, SEMC decisions as well as ensuring consistency with the current TSC, and the Climate Action Plan for Ireland and the Climate Change Act (Northern Ireland) 2022 (Act).

SEMO wishes to highlight that the majority of the SMP is TSO driven, the TSOs being the licenced parties responsible for Balancing Market Operation, etc. There are also areas that fall with the remit

[3] Shaping Our Electricity Future: Consultation – Industry Feedback Summary (p 76-77)

of SEMOpx. However, SEMO as the body responsible for Balancing Market Settlement and overall governance of the Trading and Settlement Code among other elements and as a result there will be sub-elements of this programme that are relevant to SEMO and/or this MSDPs.

Full integration into EU

The participation of the SEM in the EU markets is mandated by European law. Ireland as a EU member state and Northern Ireland, previously as part of the United Kingdom member state and post Brexit in line with the terms of the Northern Ireland Protocol.

The Go Live of the I-SEM arrangements in 2018 marked the implementation of the initial stages of integration with the pan-European electricity markets. This started with the implementation of market coupling in the ex-ante timeframe using the day-ahead market. However, the design implemented in 2018 was only the first step towards full SEM-EU and did not include elements such as continuous coupled intraday markets or participation on the EU balancing platforms.

The recoupling of the SEM with the wider European integrated energy market, due to take place in 2026, triggers the need for the aspects of the EU market framework, previously deferred or on hold, to be implemented to ensure full compliance with the electricity market network codes.

Upon recoupling, trading of electricity in Ireland and Northern Ireland through the SEM will once again be subject to EU Regulations on the Capacity Allocation and Congestion Management (CACM). This requires full participation in the Single Day-Ahead Coupling (**SDAC**) and Single Intraday Coupling (**SIDC**) arrangements. These govern trading in:

- the pan-EU day-ahead market, originally implemented as part of the I-SEM in 2018 but put on hold after Brexit[4];
- the cross border intraday continuous market, originally proposed for the scope of the I-SEM Day 2 programme but similarly deferred post Brexit; and
- the cross border intraday auctions, which have been developed in the intervening years.

The integration of the CACM requirements in the SEM was given effect with the decision of the SEMC, SEM-14-085a[5], on the High-Level Design for the new SEM arrangements to ensure compliance with the EU Target Model.

Further, forwards trading of cross border transmission rights in the SEM will once again fall under EU Regulations on the Forward Capacity Allocation (FCA) which sets out trading through the single European allocation platform Joint Allocation Office (**JAO**). This is further given effect in the SEM through the SEMC decision, SEM-15-100[6], the Financial Transmission Rights Decision Paper, which provides more detail on the form of forward trading to be implemented in the SEM. Trading of transmission rights on the SEM-EU border will be governed by these regulations and decisions.

[4] Post BREXIT, the SEM no longer had any physical connection to another European Member State for purposes of cross border coupling at day-ahead. The SEM order books are still cleared through the pan-EU platforms but no cross-border capacity allocation takes place in this process.

[5] SEM-14-085a – High Level Design for the I-SEM

[6] SEM-15-100 - Financial Transmission Rights Decision Paper

The EU Regulation on Electricity Balancing Guidelines (EBGL) was developed while the I-SEM was being implemented and was therefore never considered in scope for the original go-live date in 2018. While compliance with the EBGL became binding across the EU from November 23rd, 2017, Article 64 provided for transitional provisions for Ireland and Northern Ireland noting that "*the requirements of this Regulation shall apply in Ireland and Northern Ireland from 31 December 2019*". This meant that full participation of the SEM on the pan-EU balancing platforms was not required before this date and was also included as a potential scope item for the I-SEM Day 2 programme; however, this was also deferred post Brexit.

In the European Commission opinions of April 30th 2020, pursuant to Article 20(5) of Regulation (EU) No 2019/943 on the implementation plans of Ireland and Northern Ireland, the Commission states, "*that Ireland should join the EU platforms as soon as it becomes interconnected with the integrated electricity market of the EU*" and that "*that Northern Ireland should join the EU platforms as soon as the Island of Ireland becomes interconnected with the integrated electricity market of the EU.*"

Therefore, with the commissioning of the Celtic Interconnector between Ireland and France, the SEM will again be directly connected to another EU member state and all associated regulations and SEMC decisions need to be implemented to ensure compliance.

Post Brexit Trading Arrangements

In addition to the SEM-EU requirements, there is a need to consider and revise the Post Brexit Trading Arrangements. The exit of the United Kingdom from the EU in early 2021 resulted in the de-coupling of the SEM from the pan-EU day-ahead market. The SEM is now based on a local day-ahead market (still cleared through the EU platform but with no cross-border capacity allocation), followed by two regional auctions coupled with the GB market alongside local intraday continuous trading with local balancing arrangements. The Trade and Cooperation Agreement (TCA) between the UK and EU set out a solution for day-ahead trade to be implemented based on Multi-Region Loose Volume Coupling (MRLVC).

Balancing Market Updates

The requirements identified above with relation to participation on the EU balancing platforms will result in significant changes, particularly to the balancing market design of the SEM as it integrates with the EU arrangements for balancing. Other EU Regulations, notably the Clean Energy Package (CEP[7]), also has direct and significant impacts on the balancing market design, specifically in terms of the treatment of new renewable generation connecting after July 4th, 2019, which will not have priority dispatch.

Under SEM-21-027[8] the SEM Committee tasked the TSOs and SEMO with developing solutions for the treatment of variable Non-Priority Dispatch Renewable (**NPDR**) units in the SEM, noting that an interim solution should be developed in the short term before an enduring solution would be developed[9]. From this decision, an enduring solution for the treatment of non-priority dispatch renewable generators is identified as an additional need to be addressed as part of the reform of the balancing market for the SEM. We acknowledge that the most recent SEMC decision SEM-22-009 which references NPDR is currently the subject of a judicial review process and we will remain cognisant of this during the development phase.

As part of the Scheduling and Dispatch Programme (**SDP**), one deliverable is a solution for the operation of Energy Storage Power Stations (**ESPS**). This is based on a model described as "Follow PN" wherein the ESPS unit is dispatched according to its submitted Physical Notification and is not further optimised by the TSOs Market Management Systems (MMS). As part of engagement with stakeholders, it was identified that a further model needed to be considered in the longer term wherein ESPS units are considered within the TSOs MMS. This is very relevant for longer duration storage ESPS units which will operate over a number of days rather than hours. The Electricity Market Design Reform (**EMDR**) developed by the European Commission identified the need for better integration of storage (among other flexible technologies) as part of the reform options for the European electricity market. Therefore, a need for further design work in relation to ESPS units has been identified, separate to that work being implemented now under the SDP.

The Climate Action Plan of Ireland and the UK Low Carbon Hydrogen Standard (**UK LCHS**) have both indicated a need for a solution in relation to dispatchable demand (i.e., where an entity is dispatched by the TSO to consume additional energy). This is noted explicitly in version 3 of the UK LCHS which states that energy consumed by hydrogen electrolysers can only be considered low carbon "*where an electrolyser consumes electricity sourced via from the transmission or distribution network which would have otherwise led to renewable electricity curtailment, evidenced via Bid Acceptance from the relevant System Operator*". This model through which a hydrogen electrolyser is dispatched to consume energy does not exist in the SEM balancing market as currently designed but the UK LCHS envisages this approach will apply for electrolysers in Northern Ireland in the future. This identifies a need for further design work in relation to a solution for the dispatchable demand in the SEM balancing arrangements. The EMDR also further notes the importance of demand response as part of the future market design.

[7] The CEP entered into force in July 2019 with the majority of the Articles in Regulation (EU) 2019/943 applying from January 2020.
[8] SEM-21-027 Proposed Decision on treatment of new renewable units in the SEM.pdf (semcommittee.com)
[9] The interim solution is being developed under the S&D project.

While it is likely that some details, such as the mode of participation for the EU balancing platforms, may require additional decisions, the existing legal and regulatory framework require that these changes be implemented.

Key Benefits:

The full re-integration of SEM with GB and EU will bring new trading opportunities to Market Participants both in the SEM and in coupled markets and more efficient economic outcomes for consumers. It is difficult to envisage a system with the degree of renewable generation on the island of Ireland working efficiently without effective interconnection. This is as true for the market perspective as it is for the operational perspective.

Scope or Anticipated Activities:

Definition of scope and programme activities is in progress and is subject to discussions with RAs.

Dependencies:

In the immediate term the key dependencies are

1. Approval from the RAs to advance these requirements under the proposed single programme.
2. Confirmation of scope
3. Confirmation of funding with Regulatory Authorities in order to proceed.

3.3.3 Cyber

As outlined in Section 2.5 Table 4, the Cyber threat environment is evolving, and as such SEMO must continue to progress Cyber maturity levels. This programme is a continuation of the work currently being undertaken, delivering a significant number of group wide projects critical to maintaining a secure and resilient environment.

Ongoing compliance to cyber security standards is a core obligation to SEMO's customers as a provider of critical infrastructure. This is an obligation which SEMO has always considered seriously. In recent years the threat level has risen and, in particular, the targeting of utility companies has emerged.

SEMO's assets therefore require routine protection and continuous investment in physical and software-based security measures in order to maintain a baseline level of defence in the continually evolving and highly complex area of Cyber Security.

Dependencies:

Dependencies are the provision for appropriate OpEx and Capex requirements in the forthcoming PC period.

3.3.4 Data Analytics

SEMO has invested in our Data Hub allowing for the deployment of advanced analytics use cases in areas such as SEM monitoring, settlement, and registrations. This project seeks to develop further capabilities to enable advanced analysis and automation of existing Market processes while enabling future Market processes through best in class technologies to:

- **Address current issues** through the reduction in the risk of manual errors and reduction in manual effort,
- **Improve current processes**, such as increase the speed of process execution, and,
- **Prepare the MO for future activity,** for example enabling processes to increase scale and frequency in the future or facilitating the execution of processes which are currently not possible.

Key Benefits:

The continued development of Data, AI and Analytics capabilities will be central to the modernisation of SEM processes, reducing manual overheads and the risk of human error. By having a common data model and a single source of truth, it will be possible to better respond to Market Participants, improve settlement processes, perform settlement spot-checks, execute analysis on large data sets, prepare forecasts and apply Machine Learning and AI for advanced insights and predictive analysis.

The introduction of the Enterprise Data Hub and the Enterprise Data Model has significantly improved their market monitoring process by replacing an outdated, file-based "database". Previously, accessing and analysing data was a labour-intensive process limited to a single user at a time, accessing a remote platform, and required manual copying and pasting data into Excel for any form of review or reporting. The old system lacked any data visualisation capabilities which made analysis time consuming and prone to errors. The Enterprise Data Hub allows for the entire team to easily access and interact with the curated data organized in the enterprise data model. This improves data security, and automatic report generation for daily, monthly, and intrastat reports. Visualisations are automated for key metrics such as market prices, wind generation, and interconnectors, improving the speed and accuracy of data analysis. It is a substantial improvement in operational efficiency and data management. The system has not only streamlined current processes but also offers the flexibility to adapt to future use cases, opening possibilities for AI and Machine Learning dramatically changing the way the team monitors and runs the energy markets.

Scope or Anticipated Activities:

- Continued adoption of best in class cloud data services
- Automation and error reduction in existing processes
- Ability to implement future process to include
    - Volume forecasting (at different time horizons) for new market (including new services). This is assumed to be daily/month ahead/quarterly/annual forecasts by system service e.g. spinning reserve.
    - Historical volume analysis on availability of reserve and the use/call-on of specific system services.
    - Performance post-event analysis to understand how system services were deployed and to what extent different service providers have contributed to this.

Dependencies:

- Continued investment in modernisation of cloud, data, and integration capabilities.
- Maintenance and continuous prioritisation of data backlog to target high value use cases.

3.3.5 Externally Led Initiatives with Potential impact to SEMO Market Systems

As outlined in the Shaping our Electricity Future (ver1.1.) multi-year plans and latest TSO-DSO multi-year plans (2023-2027), there are several initiatives or recommendations that are being led outside of SEMO. These TSO or Regulatory Authorities' led projects may have an impact on SEMO systems, it is not possible at this stage however, for SEMO to provide detail on the impacts and therefore requirements on potential changes to the SEMO systems or to confirm if such changes will be required in the two year time horizon of this MSDP. Below is a non-exhaustive set of initiatives that may have some impact.

Externally Led Initiatives	
Item	**Description**
Demand Side Management Strategy	CRU are leading on the strategy with support from the EirGrid TSO and ESB Networks DSO. While predominantly TSO impacting, the outcome is expected to drive SEMO settlement system changes & potential changes to feed into and out of the SEMO systems.
Enduring Demand Side Units Payments	The SEMC published a decision paper (SEM-22-090) outlining a phased approach (interim and enduring) for delivering on the Clean Energy Package requirements for DSUs, in the electricity market. The approach for delivering the Enduring phase is still to be confirmed, however it is expected that there will be requirements for SEMO to implement.
Hybrids	An implementation plan is due to be developed in 2024 pending further clarity from Regulatory Authorities on the approach. Based on engagements to date, this project will likely impact SEMO Registration Systems, T&SC, Market Monitoring, and potentially Settlement Systems.
TSO/DSO "Whole of Systems Approach"	Within the EirGrid and ESB Networks published TSO-DSO multi-year plans, the Market Framework Development activity may identify dependencies or impacts on the T&SC, systems, data, and integration.
Future Arrangements of Systems Services Programme	The objective of FASS is to "Deliver a competitive framework for the procurement of System Services that ensures the secure operation of the electricity system with higher levels of non-synchronous generation." At time of this publication, it is assumed there is no impact on market systems.
Low Carbon Inertia Services	The TSOs mobilised a procurement framework for fixed services in 2023. As part of the procurement phase, no project was initiated to consider requirements or impact to SEMO specific systems. It is noted that the full market model for LCIS is currently being considered as part of the Scheduling and Dispatch programme.
Long Duration Energy Storage	SOEF v1.1 modelled the dual targets of this renewable deployment and reaching targeted renewables penetration of 80% by 2030 - it found LDES to be a key part of achieving the latter. The TSOs have published a call for evidence to assess the benefits and value associated with LDES. At time of publication, no project has been initiated to consider requirements or impact to SEMO specific systems.

Table 7 – Externally Led Initiatives with Potential Impact to SEMO Market Systems

4 Consultation Feedback

SEMO received one response to the consultation. SEMO would like to thank Energia for their feedback. A separate consultation response report will be published alongside this final version of the MSDP.

Having considered the consultation response, no new projects were identified, however at the request of the RAs, additional information on projects already included in the consultation version of the MSDP has been added. SEMO will now work with the RAs to further implement the relevant projects.

SEMO will continue to engage and provide updates to industry on any progression of the projects through the various fora, including the Market Operator User Group, the SEMO Focus Group as well as any project specific workshops that are scheduled in the future.

I. Appendix

Appendix 1 – Market Management System Release N Change Requests

Change Request Reference	Change Title	Summary of Change
SDP 01	Operation of Non-Priority Dispatch of Renewables	This CR will focus on implementation of changes required to support SDP Initiative 1 – Operation of Non-Priority Dispatch Renewables (NPDRs). Mandated by Article 12/13 of the CEP, this initiative seeks to deliver a solution that opens energy balancing actions (utilising a Physical Notification based on submitted data reflecting ex-ante position along with commercial and technical offer data) for variable NPDR units and pro rata treatment in relation to redispatch for constraint and curtailment for all variable renewable units within the TSOs' systems in the near term. Along with the changes to allow variable NPDR units to fully participate in the balancing market, the interim solution includes upscaling the relevant systems and processes for the anticipated increase in unit numbers.
SDP 02	Energy Storage Power Station (ESPS) Integration	This CR will focus on implementation of changes required to support SDP Initiative 2 – ESPS Integration. The capacity and energy storage of the battery portfolio on the island has grown substantially in the last two years. They are at a level such that keeping all battery units exclusively as sources of reserve as per the current evolution Interim Battery Solution is a significant underutilization. Additionally, as more batteries are due to be commissioned in the coming years with longer durations (i.e. batteries with substantially higher MWh energy capacities), the underutilization will continue to grow as an issue without large scale changes. The battery industry (among them Energy Storage Ireland) are looking to extend the use of batteries beyond the current Interim Battery Solution. The goal sought after by this CR is to increase the use of ESPS (batteries) in Scheduling & Dispatch by allowing participants to follow their ex-ante positions more closely and enable the control centres to realize greater value from the batteries.

Appendix 2 – Market Management System Future Release Change Requests

Change Request Reference	Change Title	Summary of Change
CR214	SEM CSB usable QA/QC screen	This Change Request details enhancements on QA/QC screen for CSB that will reduce the loading time and error. It will also help the user to compare the various run type for a selected date, which is currently not present in the functionality. It will also help user for a complete quality check on the pre run of a bill case.
CR241a	QBOA Undo Scenario 1	The SEM balancing market has at its core the functionality for calculating Bid Offer Acceptance Quantities. The intent of the design to be able to create the profiles needed for each relevant dispatch instruction enable these Bid Offer Acceptance Quantities to be calculated, in a generalised way which was intended to create the intended outcomes in all scenarios. Currently the systems are not applying the market rule set out as following in Appendix O paragraph 16: 'A Pseudo Dispatch Instruction shall not be created for a corresponding Dispatch Instruction where the System Operator issues a subsequent Dispatch Instruction with Instruction Effective Time at or before the time at which the first Target Instruction Level is reached.'
CR292	Group Constraints Editor	This Change Request would enable the Grid Controllers to input and analyse data in the Group Constraint Editor in the MMS in a more efficient manner whilst reducing the risk of incorrect data entry corrupting the downstream schedulers – LTS, RTC, RTD – thus reducing the risk of production of insecure schedules and reduced accuracy in the calculation of imbalance prices.
CR293	Moyle Single Pole Outage	Within the MA component of the Market Management System (MMS), the Maximum Import/Export Capacity (MW) under Dispatch Schedule Initialization (DSI) → MPR Interconnector Parameter are used as the upper/lower limit when calculating interconnector reserves. The import/export capacities are linked to market registration data, which cannot be changed by the control room. In order to amend these values a request must be submitted to the Registration Team at least 5 working days before the corresponding Trade Date. In the event of Moyle Single Pole forced outage, where a single pole can be forced due

Change Request Reference	Change Title	Summary of Change
		to a fault, the control room are unable to change the maximum import/export capacity, which can result in an overcalculation of reserve provision.
CR295	Unit Under Test Approval	Currently in MMS, when a Unit Operator submits a 'Physical Notification with Unit Under Test flags' associated with it, the PN is diverted to a holding location pending a manual approval by a Grid Controller. When the Grid Controller reviews and approves the 'PN with test flags' it immediately disappears from the display and is made available in the database out of sight of the Grid Controllers to the DSI process for use in scheduling.
CR300	Fixed Generation Display	In MMS, currently there is no dedicated display available to view the list of fixed generation units and their MW contributions. In the coming years, as a large number of new fixed generation units get added to the MMS system, it would be beneficial for the grid controllers to be able to view all connected fixed generation units on the system and their MW contribution after an LTS/RTC run.
CR302	Changing Fatal error message to warning message	ICMP via an external interface sends National Grid (NG) import and export prices for interconnector trading to the MMS. In cases where the submitted NG prices contain an import price block which is less than an export price block, DSI validation fails which prevents MMS from generating a feasible cost curve. The proposed change would alert the Grid Controllers if an import price block is less than an export price block for the interconnectors but would not cause any of the LTS, RTC or RTD schedulers to fail. This is a more efficient means of mitigating the issue whilst reducing the risk of the schedulers failing, and thereby removing the risk to the scheduling and dispatch functions of the control room and ultimately to determination of the imbalance price for the affected periods.
CR305	System Action Repricing – Mod_17_22	This is a change to the Trading and Settlement Code that will require a change to the Market Systems, namely Imbalance Pricing. The detail of this modification is set out further below. The current system for Imbalance Pricing has become inadequate to handle high volume TSO redispatch events, resulting in potential ineffectiveness of NIV (Net Imbalance Volume) tagging. This has caused concerns around the

Change Request Reference	Change Title	Summary of Change
		accuracy of cash-out and the reflective nature of energy actions. This change request relates to a modification to the Trading and Settlement Code which amends the calculation of Price Marginal Energy Action (PMEA); the calculation should now incorporate the max of Strike Price (PSTR) and Market Back Up Price (PMBU), instead of Price Cap (PCAP), where no energy action has been identified in the direction of the Net Imbalance Volume. The proposal is aimed at ensuring accurate cash-out and a true reflection of energy actions, without affecting price formation or depressing the true price. The use of PMBU (Market Back Up Price) will provide a value of energy where no balancing actions exist, and improve the overall accuracy of the system.
CR278	Re-design of Unsecured Bad Debt (Shortfall) process	Where a Participant defaults on a payment which is owed to the Market and the Credit Cover the Participant has in place is not sufficient to cover this Shortfall, the unrecovered amount or Shortfall is considered Unsecured Bad Debt (Shortfall event). In such instances, these unpaid amounts must be spread across SEM Creditors (Generators only) as per the Trading & Settlement Code (calculation method specifies generators). The intention is to collectively account for the defaulting participant's failure to pay their Settlement Document across SEM Creditors (Generators only). The Market Operator must calculate the Unsecured Bad Debt and pro-rate it against open Settlement Documents for generators only. The pro-rated Unsecured Bad Debt is issued in the form of Debit Notes which are sent to participants to facilitate the balancing of the market. If the defaulting Participant pays their Bad Debt including applicable default interest this process gets reversed meaning all Generators Units whose payments were reduced because of the default will be paid back their outstanding amounts with interest. Also, with the Shortfall process there is potential for a defaulting participant to default on their payments in the week after the first default, so this process could run multiple times back-to-back.
CR309	Disable Interruptible Load feed from MMS to EMS	This change is requested as part of the upgrades to the Ramping Margin Tool which will result in the removal of the existing Reserve Scheduling Data (RSD) application. At present, interruptible load is used as a workaround to model reserve from batteries in both EMS and MMS. To remove these limitations, both MMS and EMS require

Change Request Reference	Change Title	Summary of Change
		changes, however due to varying timeframes for these changes, a separate Interruptible load calculation will be required for a period where changes are made to one system but not to the other. RMT will be modified to calculate separate Interruptible load values to feed both MMS and EMS separately.
CR311	Interconnector MMS Correction	EirGrid Market Interface teams receive requests from the Interconnector Administrator for changes to be made to standing data for a particular interconnector within the market systems - such as maximum ramp rate, import or export capacity, etc. When these required changes are made within the "Resource Balancing" section of the Market Participant Interface, the existing values for 'EMS Code' and 'Priority Dispatch Category' in the OUI Resource Balancing tab are removed and left blank. This has knock-on impacts to NCC Scheduling Tools and the Ramping Margin Tool, and a script is required from Hitachi Energy before any change can be made to ensure the values are inserted. This delays the process of making changes and introduces unnecessary risk for the control centre. This Change Request seeks to address this issue.
CR313	Update to Start Up Payment Conditions	This change request is the result of a modification to be raised in early 2024 which will amend the conditions for which Start Up Cost (CSU) payments will be paid to units. Currently, units are paid (CSU) if a Bid Offer Acceptance (BOA) derived from a Synchronise Dispatch Instruction (SYNC DI) is settled on complex Commercial Offer Data (COD). Due to how profiling is carried out, this results in units not receiving a CSU payment in certain scenarios, such as when the units Final Physical Notification (FPN) is non-zero and the unit can profile to its FPN with a SYNC DI within a single settlement period. A key concept within instruction profiling is the idea that when a new "profile" (dispatch instruction (DI); either a "real" DI or a "pseudo" DI for profiling purposes) is created, it closes the currently open "profile". Consequently, this CR is required to change the settlement system to ensure units are paid CSU correctly and in a more consistent manner.