

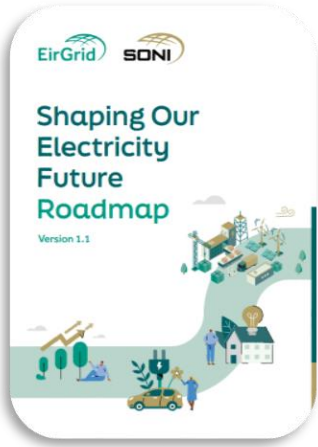
Strategic Markets Programme

Market Operator Special Topic (MOST)

14th March 2024



Strategic Markets Programme



- In November 2021, EirGrid Published, “[Shaping our electricity future Roadmap](#)”. This document is defined as “a roadmap to achieve our renewable ambition”. This document was updated in July 2023 with “[Shaping Our Electricity Future Roadmap Version 1.1](#)”. The Roadmap provides a commitment to the public and market participants on what EirGrid plans to deliver by 2026.
- In April 2023, the EU & GB Integration Programmes (SEM 4.0) was established to define a plan for delivery of the projects as defined by “Shaping Our Electricity Future Roadmap Version 1.1” to achieve the strategy. Section 7.4.4 of the V1.1 roadmap is dedicated to “Pillar 2: full integration of the SEM into GB and EU markets”, which provides the Scope of delivery for this for this programme.

- As a result of Brexit, the Single Electricity Market (SEM) is now uncoupled from Great Britain (GB) and European Union (EU) day-ahead markets and the capacity calculation process.
- Pillar 2 of Shaping our Electricity Future (SOEF) v1.1 aims for full re-integration with the GB and EU markets in the future with complete trading arrangements across different markets.
- **EU:** In Q4 2026, the Celtic interconnector is planned to go live with trading arrangements between Ireland and France resulting in the SEM’s re-integration with the EU market. Prior to this, the SEM needs to be ready for full participation in the EU single day ahead (SDAC), single intraday coupled markets (SIDC), and the EU Balancing Platforms (PICASSO, TERRE, MARI).
- **GB:** Currently only pre-existing arrangements for trading over intraday markets exist between SEM and GB. The Trade and Cooperation Agreement (TCA) sets out an arrangement for volume coupling under the Multi Regional Loose Volume Coupling (MRLVC) implementation for trading in the day-ahead timeframe between GB and EU.
- **Balancing Market Updates:** This will investigate items like scheduling of long duration storage, enduring implementation of Non-Priority Dispatch Renewables and Dispatchable Demand.



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Key Benefits

The benefits of integration with European markets include;

- *security of supply;*
- *promotion of renewable energy sources;*
- *establishment of a level playing field in which competitors can flourish;*
- *maximise the efficient use of interconnectors; and*
- *provision of a sound investment climate that is based upon a stable and predictable regulatory framework.*

Delivering on obligations within;

- *the Clean Energy Package (CEP);*
- *the Climate Action Plan for Ireland; and*
- *the Climate Change Act (Northern Ireland) 2022 (Act).*

Appropriate trading arrangements between the SEM and Great Britain post Brexit, and other obligations under European Union regulations.

Successful implementation of the programme will deliver many benefits for consumers in Northern Ireland and Ireland such as;

- *Full coupling of ex-ante markets (across day-ahead and intraday) with European partners to facilitate efficient trading between the SEM and European markets*
- *Full coupling will also provide the capability for export of excess renewable generation. This will provide value for consumers in the SEM where unused energy can be sold to foreign consumers rather than remaining unsold. And will aid in the achievement of renewable energy and Carbon and GHG targets*
- *Integration with EU balancing mechanisms will facilitate trade of reserves with foreign providers, yielding value for consumers in the SEM, as well as with local providers thus incentivising investment in key technologies to support renewable integration*

Compliance of the SEM with EU regulations (EU) 2016/1719 FCA, (EU) 2015/1222 CACM, and (EU) 2017/2195 GLEB



Approach to the Strategic Markets Programme

The SMP is at an early stage of understanding the full scope and approach to delivery of the requirements, it is clear, even at this early juncture, that implementation of the SMP will be significant, with an initial Very Rough Order of Magnitude (**VROM**) cost estimate placing the scale of the programme potentially in excess of €130m.

The SMP is a multi-year programme for the design and delivery of revised market arrangements, including the revisions to the Trading & Settlement Code, Grid Codes, and licences, and supporting IT systems and services. The Phases of the SMP are provided below;



The SMP is a multifaceted programme where resources will be required to drive multiple workstreams, each consisting of numerous interdependent activities that need to be appropriately resourced and managed.

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The detailed scope and deliverables under the SMP programme will only be defined and refined through delivery of Phase 1 and 2. When these phases are complete, the programme will share them with IT specialists who will develop the technical requirements for tendering and then for implementation.

It is likely that due to the size of the scope and level of change required to be delivered under the SMP that not all scope items will be delivered within the timeframe, Q1 2027.



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Key Achievements to date

- ✓ Programme mobilised
- ✓ Completed Phase 0 Programme Initiation in Q3 2023
 - ✓ External consultancy support for programme management of the initial phases in place
 - ✓ High-level scope of the programme defined
 - ✓ High-level programme plan developed
 - ✓ High-level capability impact assessment developed
 - ✓ Programme Initiation Document (PID) developed
 - ✓ Funding submission issued to RAs in December 2023
 - ✓ Dedicated team from across the businesses to work on the programme, with a dedicated manager
- ✓ Phase 1 Analysis and Planning initiated
 - ✓ High Level Requirements definition initiated



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Full integration into EU

Once the SEM is physically connected with continental Europe after the Celtic Interconnector goes live, there will need to be full integration into EU forwards, day-ahead, intraday, and balancing markets. This involves re-coupling the day-ahead market but also new arrangements for coupled intraday markets and participation on the EU balancing platforms



Post Brexit Trading Arrangements

Following Brexit, we only have local intraday auctions between SEM and GB. We will need to implement the changes that arise from the ongoing UK and European Commission discussions on same



Balancing Market Updates

This will investigate items like scheduling of long duration storage, enduring implementation of Non-Priority Dispatch Renewables and Dispatchable Demand.



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➤ Full integration into EU -

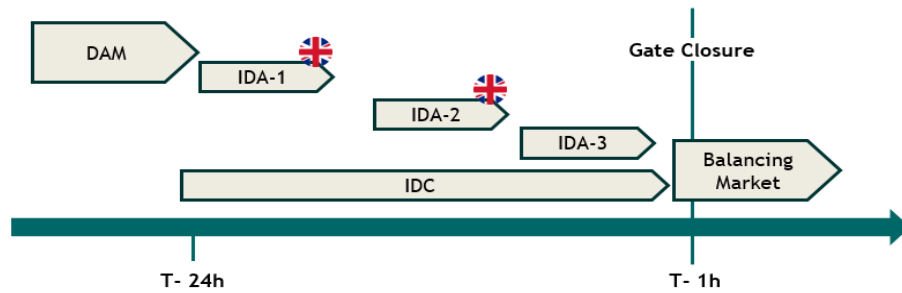
- I-SEM Programme delivered coupling at day-ahead in 2018, with regional SEM-GB intraday auctions and local intraday continuous trading (and final IDA)
- Not delivered by I-SEM Programme but expected in following years -
 - *Cross border intraday continuous;*
 - *Participation on EU Balancing Platforms (TERRE, MARI, PICASSO, IGCC)*
- Post Trade & Cooperation Agreement (BREXIT), the SEM ceased to be coupled at DAM while regional SEM-GB intraday auctions were unaffected
- Obligations under many regulations are not enforced while the SEM has no physical connection to continental Europe
- With the commissioning of the Celtic interconnector, many of the obligations that are currently not enforced, will be
- Since the SEM left coupling in 2021, the EU has developed and implemented intraday auctions along with the continuous market



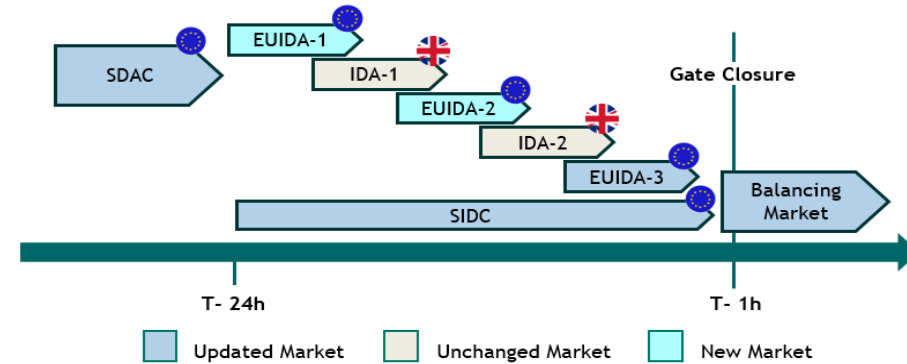
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➤ Full integration into EU -

Current Market Arrangements



Future Market Arrangements



➤ Future design has the following features -

- Day-ahead market re-coupled with EU
- SEM-GB intraday regional auctions retained
- Introduction of three additional intraday auctions coupled with EU
- Transition from local continuous to coupled cross border continuous market

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➤ Post Brexit Trading Arrangements -

- Trading between GB and the EU is set out in the Trade & Cooperation Agreement (TCA) and governed by the Specialised Committee on Energy (SCE).
- The TCA requires implementation of a Multi-Regional Loose Volume Coupling (MRLVC) solution at day-ahead on SEM-GB borders (before addressing intraday and balancing arrangements)
- MRLVC was due to be in place in 2022 - this has not happened.
- Principal issues related to potential impact of MRLVC on operations of the pan-EU day-ahead coupling.
- Despite some engagement, EC and UK have not agreed on a path forward. The UK wants to move to an implementation Phase while the EC wants to do more analysis including on Offshore Hybrid.
- Following the SCE meeting in November there are a number of questions that are being asked of EU/UK TSOs to address in a study over the next 9-12 months around: offshore compatibility, timelines and operational procedures and governance. As a result, there is likely to be a project involving the TSOs coordinated by ENTSO-E.



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➤ Balancing Market Reform -

- While integration with EU platforms is an EU Policy requirement, the system changes will be to the TSOs Market Management System.
- This will involve sharing merit orders with the platforms and integrating results into our QBOA and PBOA processes.
- Other significant changes to balancing arrangement are needed in this timeframe -
 - Enduring solution for Energy Storage Power Stations (beyond “Follow PN”);
 - This should include solutions for long duration energy storage (i.e., > 100 hours);
 - Dispatch up of demand - instructing participants to increase consumption (e.g., for electrode boilers, hydrogen electrolysers, etc.);
 - Enduring solution treatment of Non-Priority Dispatch Renewables (grandfathering of constraints, i.e., apply commercial offers in constraint management);
- These additional changes are being driven by EU regulation, SEMC decisions but also operational need - these technologies are being built by participants and TSOs and MO require the correct tools to manage them



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Policy Drivers for scope

ID	Title	Description	Policy Driver	Workstream			EU Regulation	Essential for efficient flow of electricity with EU
				SEM-EU	SEM-GB	Balancing Market Reform		
1	FTR Auctions SEM-EU Interconnectors	Design and develop solutions for Financial Transmission Rights Auctions (FTR) on SEM-EU Interconnectors. This will be developed in conjunction with the Joint Allocation Office (JOA). This initiative includes ACER's consultation on forwards design and its potential impact on SEM-EU FTRs.	Reg (EU) 2016/1719 on FCA SEM-15-100 - Financial Transmission Rights Decision Paper	✓			✓	✓
2	TR Auctions for SEM-GB interconnectors (Post Brexit)	The development of transmission rights (TR) auctions on the SEM-GB border.	TCA		✓		✓	
3	Determine Capacity Calculation Region (CCR)	Complete detailed analysis to determine the appropriate capacity calculation region for the SEM-EU border, considering options of Core, Hansa, or a custom SEM-EU CCR.	Reg (EU) 2016/1719 on FCA Reg (EU) 2015/1222 on CACM	✓			✓	✓
4	Agree Capacity Calculation Methodology	Should the Capacity Calculation Region determination result in a custom CCR for the SEM-EU border, it will be necessary to determine and agree the methodology to be used. This will be agreed between the SEM TSOs (EirGrid, SONI) and the French TSO (RTE). If it is agreed that the SEM-EU border becomes part of Core CCR, then this step is no longer required as the Core capacity calculation methodologies will be adopted.	Reg (EU) 2016/1719 on FCA Reg (EU) 2015/1222 on CACM	✓			✓	✓
5	Determine cross zonal capacity calculation for SEM-GB	Work with EU TSOs and GB TSOs to develop a new cross zonal capacity calculation to support the MRLVC implementation.	TCA		✓		✓	

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Policy Drivers for scope

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6	Creation of individual grid model (IGM)	A grid model for the SEM system (Grid Models are bidding zone based per CACM) needs to be developed for inclusion in the creation of a pan-EU common grid model.	Reg (EU) 2015/1222 on CACM	✓			✓	✓
7	Creation of common grid models (CGM)	Individual grid models developed in different jurisdictions are merged into a common grid model. This is a task of the Regional Co-ordination Centre (RCC).	Reg (EU) 2015/1222 on CACM	✓			✓	✓
8	Submission of IGM to RCC	Each TSO must submit its IGM to the RCC for merging into the pan-EU common grid model. This involves a task of the Regional Co-ordination Centre.	Reg (EU) 2015/1222 on CACM	✓			✓	✓
9	Multi-NEMO arrangements for EU Cross Border Markets	TSO needs to include a solution for multi-NEMO Arrangements (MNA) within the pan-EU markets post 2026. This should follow the common approach developed across the EU by the owners of EUPHEMIA.	Reg (EU) 2015/1222 on CACM	✓		✓	✓	
10	Cross border shipping on SEM-EU border	Design and implement arrangements for cross border shipping resulting from ex-ante market activity (both Day Ahead Market (DAM) and Intra Day Ahead (IDA)) across the SEM-EU border. Arrangements are expected to follow those implemented for the SEM-GB border as part of the I-SEM programme	Reg (EU) 2015/1222 on CACM	✓			✓	✓
11	Review DAM options for SEM-GB (MRLVC)	In the event that MRLVC cannot/will not be implemented, this task is to consider design options for an alternative approach to determining cross border flows between SEM and GB at Day-ahead.	TCA		✓		✓	

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Policy Drivers for scope

ID	Title	Description	Policy Driver	Workstream			EU Regulation	Essential for efficient flow of electricity with EU
				SEM-EU	SEM-GB	Balancing Market Reform		
12	Develop solutions for intraday trading	Consider options for integration of the SEM with EU ex-ante markets.	Reg (EU) 2015/1222 on CACM	✓			✓	✓
13	Manage congestion rent for pan EU intraday markets	Develop arrangements for the distribution of congestion rent among transmission rights holders on SEM_EU Interconnectors.	Reg (EU) 2016/1719 on FCA Reg (EU) 2015/1222 on CACM	✓			✓	✓
14	Multi NEMOs in Balancing	Update data exchange systems of TSOs/SEMO to receive Ex-Ante Quantity (QEX) submissions from more than one NEMO, creation of balancing market units for each NEMO and implementation of settlement rules for same.	Reg (EU) 2015/1222 on CACM	✓		✓	✓	
15	Participation to EU balancing platforms MARI (mFRR) and TERRE (RR)	Develop a solution for the integration of the pan-EU Balancing Platforms into the SEM balancing market systems. This will consider how outputs are determined, how they are exchanged between the TSOs and the operators of the Balancing Market (BM) Platforms. This will involve data exchanges back and forth between the Market Management Systems (MMS) and the MARI/TERRE platforms (through appropriate security firewalls, etc) as well as integration of the outputs of the BM Platforms into the TSOs dispatching solutions.	Reg (EU) 2017/2195 on GLEB	✓		✓	✓	✓

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Policy Drivers for scope

ID	Title	Description	Policy Driver	Workstream				Essential for efficient flow of electricity with EU
				SEM-EU	SEM-GB	Balancing Market Reform	EU Regulation	
16	Determine output imbalance price and imbalance settlement rules	Incorporate activations (QBOA) determined by MARI/TERRE into the stack for the determination of imbalance price. Incorporate the price of these activations based on the EU platforms as a PBOA in the imbalance pricing calculation. This will need to be incorporated into downstream settlement also.	Trading & Settlement Code Part B, Version 28.0	✓		✓	✓	
17	Integrate tasks of the Regional Coordination Centres into the SEM	Generic requirement to document any data exchanges required between the TSOs and the Regional Coordination Centres. These are data exchanges that need to be automated, auditable, and related to the RCC tasks already detailed in the programme plan	Reg (EU) 2019/943 on the internal market for electricity (recast)	✓			✓	
18	Enduring solution for Non-Priority Dispatch Renewable (NPDR)	Grandfathering of constraints (i.e., apply COD from NPDR units in application of constraints before non-market based redispatch is applied).	Reg (EU) 2019/943 on the internal market for electricity (recast)			✓	✓	
19	Enduring storage in energy balancing	Develop enduring solution in energy balancing for both long and shorter duration storage facilities. This will extend beyond the "follow PN" solution to be implemented as part of the Scheduling & Dispatch programme and will include a fuller optimisation of these facilities.	Electricity Market Design Reform (EMDR)			✓		
20	Dispatchable Demand	This will provide a solution where the TSOs can elect to dispatch on consumption when it is economic to do so or when system conditions support this action (e.g., dispatching of consumption to avoid redispatch down of renewable generators). This option (a Dispatchable Consumption Unit) can apply to various types of assets such as electrode boilers, hydrogen electrolyzers, etc.	Climate Action Plan for Ireland UK Low Carbon Hydrogen Standard			✓		

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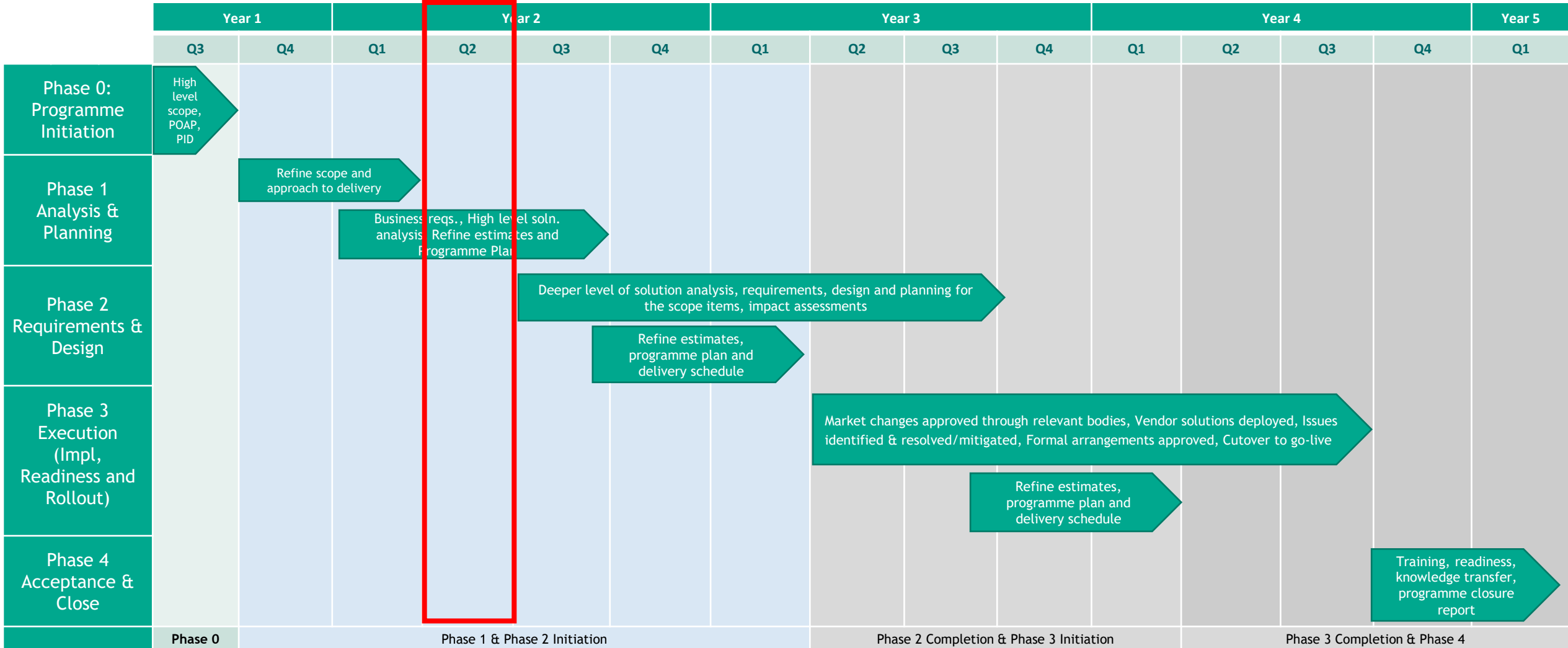
Policy Drivers for scope

ID	Title	Description	Policy Driver	Workstream			EU Regulation	Essential for efficient flow of electricity with EU
				SEM-EU	SEM-GB	Balancing Market Reform		
21	Demand Response	Develop updated solutions for demand response in the SEM beyond the current Demand Side Unit (DSU) model as well as extending the current DSU model.	EMDR			✓		
22	Full market model for LCIS in scheduling & dispatch	Develop a solution for sources of Low Carbon Inertia Services (LCIS). This should see a specific unit type, with specific scheduling options available in the market management system.	SEM-23-064			✓		
23	Retrieve outputs from RCC (Scheduled Exchanges)	Determine explicit interconnector power flows from net positions/scheduled exchanges determined from the ex-ante market.	Reg (EU) 2015/1222 on CACM	✓		✓	✓	✓
24	Updated inputs from Interconnector Reference Programme (ICRP), increased frequency as a result of SIDC, etc	Determine updates needed to current platforms based on change of frequency of data driven by other changes. This is to account for the change from two ICRPs in the current arrangements (based on SEM-GB intraday auctions) to 48 ICRPs on the SEM-EU (based on a new position at each gate closure of intraday at delivery hour - 30 mins)	Reg (EU) 2015/1222 on CACM	✓			✓	✓
25	Scaling due to increased participation of NPDR and increased activity on MMS	With the implementation of solutions for NPDR this will increase the level of dispatchable generators on the system while elements of the SDP will also include changes to WDT which will increase the frequency of dispatch instructions to wind/solar generators. The level of change will need to be assessed to determine if current TSO systems are capable of delivering solutions to meet this expected level of change of data exchange volume/frequency.	Reg (EU) 2019/943 on the internal market for electricity (recast)			✓	✓	

Strategic Markets Programme - Indicative High-Level Programme Plan On A Page (POAP)

DRAFT

Critical Path Milestone:
Funding Application to be approved by RAs within Q2 ★



Questions?

- If you have any further queries, please direct them to the below mailbox;

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