

SEM Ex-Ante Market Design For EU Re-Integration

29th May 2023



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1. Introduction

The Celtic Interconnector is a planned 700MW DC interconnector linking the Single Electricity Market (SEM) and France (FR). The target date for commissioning and market entry is Q4 2026.

The implementation of the Celtic Interconnector will physically reintegrate the SEM with the European Energy Markets, following isolation as a result of Brexit. Celtic will need to be established in the SEM ex-ante and balancing markets, as well as in the corresponding French markets.

A revision of the current SEM market structure is necessary to facilitate new cross-border trading opportunities between the SEM and France, whilst maintaining cross-border trading opportunities between SEM and Great Britain (GB). As the Celtic Interconnector will form part of the European Internal Energy Market there is a requirement to ensure the SEM arrangements comply with EU regulations for Single Day Ahead Coupling (SDAC), Single Intra Day Coupling (SIDC) as well as Balancing Markets.

The paper provides SONI and EirGrid - as SEM TSOs and SEM MOs (referred to in this paper as collectively as “SONI and EirGrid”) views on the future design for the ex-ante markets as part of the EU Re-integration.

2. Market Design

2.1. Current Market Arrangements

The SEM currently has two interconnectors, EWIC and Moyle with a third, Greenlink, due to go live by end of 2024. Post Brexit these interconnectors couple SEM with GB through the Intraday Auction 1 (IDA1) and Intraday Auction 2 (IDA2) markets.

Three local auctions also take place, the Day Ahead Market (DAM); Intraday Auction 3 (IDA3) and the Intraday Continuous (IDC) market.

The current SEM design is outlined in the table below.

Coupled Market		
SEM-GB	SEM-FR	Local
		DAM
IDA1		
IDA2		
		IDA3
		IDC

Although the DAM is local and not coupled with another jurisdiction, it is still operated as part of the European Single Day Ahead Coupling (SDAC). Post-Brexit the DAM is not coupled with GB and hence no longer coupled to Europe as it was previously.

In France, SDAC and SIDC continuous trading already operates in a coupled setup with the surrounding European jurisdictions.

2.2. Planned Future Market Arrangements

SDAC is expected to continue to be the cornerstone of the European coupled market for the foreseeable future and forms the core of the Internal Energy Market.

The SIDC continuous market is also expected to be maintained long term.

ACER are promoting further enhancement of the European coupled markets to include three SIDC Intraday coupled auctions (SIDC EU IDAs). These are due to go-live in all European jurisdictions by 2025. As such, SIDC-EU-IDAs would be active prior to Celtic go-live. In France, RTE is planning to implement SIDC-EU-IDAs on all existing interconnectors in line with EU requirements.

The EU and UK authorities, through the Trade and Co-operational Agreement (TCA), are also currently considering the implementation of Multi-Regional Loose Volume Coupling (MRLVC) which would adjust inputs to SDAC to define SEM-GB flows before SDAC. MRLVC is only expected to impact on the inputs to SDAC and hence does not explicitly impact on the wider ex-ante market design for SEM-FR.

2.3. Identification of Options

In evaluating the options for the design of the ex-ante market with the implementation of interconnection to France, the following criteria were to be considered on a qualitative basis:

- Legal Compliance with EU and SEM regulations and decisions¹
- Technical Feasibility of Solution
- Creation of Opportunities for Market Participants to Trade
- Expected Welfare Benefit through maximising interconnector flows.
- Cost and Complexity of Implementation
- Cost and Complexity of Operation

While theoretically the market coupling for SEM-FR could be limited to SDAC, to fully utilise the benefits of market coupling, intraday trading must be part of the solution.

After investigations and discussion with the European coupling organisations responsible for the markets' implementation and operations, along with considering the planned design of the EU Intraday markets, it became clear that there is only one technically feasible market structure for the intraday design solution. The technical design of the planned EU Intraday markets will require all SIDC-EU-IDAs and SIDC continuous to be implemented together to manage the exchange of the available capacities between the different market timeframes.

Therefore, the design outlined below, is considered the only feasible option to implement EU Re-integration and provide the market arrangement necessary for trading on the Celtic Interconnector from both a technical and compliance perspective, whilst also enabling the maximisation of economic benefit of the market coupling.

¹ Including: [Capacity Allocation and Congestion Management Guideline](#) (CACM), [SEM Energy Trading Arrangements Decision](#) and the [ACER approved methodology for SIDC-EU-IDAs](#).

2.4. Future Ex-Ante Design

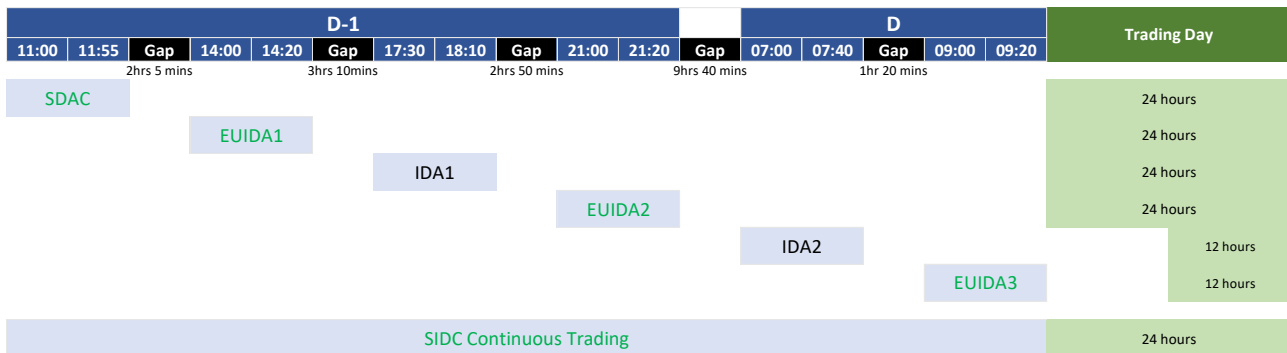
The future design is technically feasible, is fully compliant with EU requirements, provides ample trading opportunities for market participants and maximises interconnector utilisation while using standardised design to minimise costs and risks of implementation and operation.

The design consists of six coupled auctions and a coupled continuous market.

Coupled Market		
SEM-GB	SEM-FR	Local
	SDAC	SDAC
	EUIDA1	
IDA1		
	EUIDA2	
IDA2		
	EUIDA3	IDA3
	SIDC	IDC

As illustrated in the diagram above, this would mean replacing the existing three local markets (Local SDAC, IDA3 and IDC) with coupled markets with France and the addition of two new coupled auctions into the SEM ex-ante market arrangements. There would be no change to the market coupling arrangements with GB as a result of this design.

A further illustration of the timing of these auctions and the proportion of the trading day they relate to is provided in the diagram below.



2.5. Assessment of the Future Design

The assessment of the future design against the evaluation criteria is provided below.

<p>Legal Compliance with EU and SEM regulations and decisions²</p>	<p>This future design is fully compliant with ACER expectations as it contains all aspects of the SDAC and SIDC-EU-IDAs and SIDC continuous market.</p> <p>Given that the SEM will now be physically linked to Europe and once again part of the European Internal Energy Market, the SEM will require full compliance with EU Regulation. Securing acceptance from the European Commission, ACER, the French regulator CRE, and RTE on any alternative option, which is not fully</p>
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² For examples: Capacity Allocation and Congestion Management Guideline (CACM), SEM Energy Trading Arrangements Decision.

	<p>compliant with EU regulations, would be challenging. There would be significant effort expected from SEM TSOs, the SEM RAs and the relevant Departments to try and achieve an exemption for the SEM and which may very well not be successful given the expected positions of relevant parties.</p>
Technical Feasibility of the Solution	<p>The future design is the only technically feasible option that allows trading in the intraday timeframe as well as the day-ahead. This is based on discussions with the relevant SDAC and SIDC regarding the technical implementation of the markets. The key realisation in these discussions being that the planned EU Intraday markets will require <u>all</u> SIDC-EU-IDAs <u>and</u> SIDC continuous to be implemented together to manage the exchange of the available capacities between the different market timeframes.</p>
Creation of Opportunities for Market Participants to Trade	<p>With six coupled auctions the future design provides greater choice for market participants to trade.</p> <p>Given auctions are not mandatory, market participants can choose to participate in the auctions that provide them with the most benefit, while not being forced to participate if they deem it non-beneficial.</p> <p>One of the benefits of implementing all the auctions is that should trading behaviours and liquidity move from one auction timeframe to another, or from the auctions to continuous or vice versa, the SEM market will not need to go back and implement additional auctions at a later date to take advantage of the changing trading behaviours and will therefore avoid the associated lead times of potentially a number of years for such changes to be implemented.</p>
Expected Welfare Benefit through maximising interconnector flows	<p>The multiple coupled auctions provide substantial opportunities to trade across the interconnectors and maximise the welfare benefits to the SEM of interconnection.</p> <p>The design maintains the SEM principle of the ex-ante spot markets being the exclusive trading environment day-ahead and intraday. This will help to ensure efficient and effective outcomes through implicit price coupled auctions.</p>
Cost and Complexity of Implementation	<p>While the future design does include the addition of two coupled auctions, it utilises the existing local auctions and the existing auction and continuous trading systems. This will help to minimise the disruption and cost of implementation for market participants.</p> <p>By implementing the SIDC-EU-IDAs and continuous together, and not trying to create a partial implementation of SIDC markets, this simplifies the implementation as there is less bespoke development needed. Instead, the implementation can utilise existing standard features of SIDC and functionality from the trading systems and capacity management systems that are already being used throughout Europe.</p> <p>Use of a standard design for SIDC will also make co-ordination and implementation with the European market organisations, such as SDAC and SIDC easier and minimise the risks associated with the implementation.</p>
Cost and Complexity of Operation	<p>The future design will see an extended trading day for market operations and additional system operation activities due to interconnector flows being updated more often and closer to real time with the additional SIDC-EU-IDAs. This cannot be avoided though and is a consequence of the European focus on development of intraday trading opportunities such as SIDC continuous and SIDC-EU-IDAs.</p> <p>By implementing the standard model for SIDC auctions and continuous this will reduce the operational cost and complexity, resulting in synergies that can be</p>

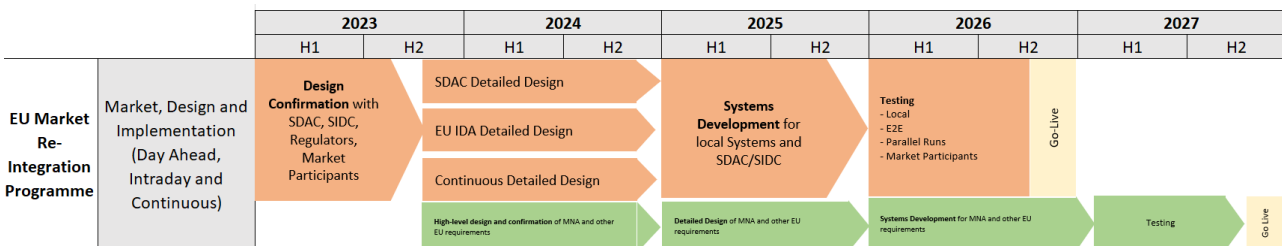
	<p>captured by the SEM power exchange as it will utilise similar operations to other regions across Europe.</p> <p>Market Participants are free to decide which auctions they participate in, and the extent of their trading desk activities based on their identified benefit/cost of maintaining particular trading desk hours.</p>
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Other points of note regarding the design:

- The SEM TSOs have worked closely with RTE during the formulation of the future design and RTE agree that the future design is the best way forward for the SEM-FR market coupling.
- The future ex-ante market design does not preclude any decision on whether Financial or Physical Transmission Rights are made available on Celtic.
- The future design will potentially require the SEM-GB IDA2 to be run earlier to allow sufficient time between the SEM-GB IDA2 and the SIDC-EU-IDA3 auctions. This would require buy-in from the SEM and GB parties to accommodate, should market participants need this.
- The Local IDA3 would be removed to reduce the number of auctions and avoid the overlap of operation of IDA3 and SIDC-EU-IDA2 which would be scheduled to run at very similar times. However, it is believed the removal of this local auction could be mitigated by liquidity being pooled in the SIDC continuous for these last 6 hours of the trading day.

3. Delivery Plan

The diagram below outlines delivery plan and timeline for the Ex-Ante Market components of EU Re-integration.



The loss in benefits to end customers due to any delay in the implementation of market coupling functions between SEM and France is significant. Therefore, ensuring the delivery of the core market coupling functions i.e., SDAC and SIDC (Auctions/Continuous) is critical.

The delivery plan has also been considered in the context of the other significant projects within the scope of the EU Re-integration programme including Capacity Region Calculation, Individual and Common Grid Models, new Balancing Platforms (TERRE/MARI), Forwards Markets, and System and Market Operator system changes.

Consequently, the delivery plan focuses on delivering the essential ex-ante elements needed for market coupling first, with additional EU requirements following soon after by other deliverables including SEM Multiple Nemo Arrangements (MNA) and any other EU requirements that are identified in the coming years relating to Ex-Ante Markets.

Confirming the design in 2023 minimises the risks to the project and increases its potential for success by helping to ensure that:

- a) Market Participants have sufficient advance notice of the coming changes and can prepare accordingly.

- b) the Market Operator and System Operators have sufficient time to implement the required market system changes.
- c) the SDAC and SIDC organisations have sufficient advance notice to schedule the required coupling arrangements into their workplans - especially given the numerous projects that these organisations are trying to implement and manage over the next number of years.

4. Conclusion

SONI and EirGrid believe that the future ex-ante market design as outlined in section 2.5 best meets the criteria regarding legal compliance, technical feasibility, opportunities for trade, benefits to end consumers through welfare gains and the costs and complexity of implementation and operations.

An online workshop will be organised for 12th June 2023 to allow further discussion on the design.

SONI and Eirgrid welcome any comments from market participants on the future market design and would request any feedback on the design is provided by 20th July 2023 via info@sem-o.com.