

# SEM-GB Cross-Border Clearing and Settlement Arrangements

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A SEMOpx submission to the Commission for Regulation of  
Utilities and the Utility Regulator under CACM Article 77

July 2017



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## 1 Purpose

This paper is submitted to the Commission for Energy Regulation (CER) by EirGrid and SONI, acting together as SEMOpx, to seek approval for proposed cross-border clearing and settlement arrangements, under Article 77 of EU Commission Regulation 2015/1222, establishing a guideline for Capacity Allocation and Congestion Management (CACM). This paper will also be submitted to the Utility Regulator of Northern Ireland (UR). The parties that are impacted by this Article are SEMOpx and the two interconnectors, EWIC and Moyle. CER and UR have a role as economic regulator for these three parties.

The paper describes the operation of the relevant Articles in CACM regarding cross-border shipping, clearing and settlement, and discusses the various shipping and central counter party (CCP) models used elsewhere in Europe. The paper also describes and proposes that, since there will be the same entity fulfilling the role of CCP at either end of the interconnections between the Single Electricity Market (SEM) on the island of Ireland and the electricity market operating in Great Britain, an intra-CCP model should be implemented to provide the most efficient SEM-GB solution.

## 2 Introduction

CACM came into effect in August 2015 with the purpose of establishing single day-ahead and single intraday solutions for Europe which allow the efficient allocation of cross-border capacity. In order to allocate its capacity, the TSO that owns the cross-border capacity provides its cross-zonal capacities to a Nominated Electricity Market Operator (NEMO) for allocation in the NEMO's markets (day-ahead and intraday). Following this, the NEMO enters the capacity into the single day-ahead or single intraday solution for allocation. The Price Coupling of Regions (PCR) is the single day-ahead solution for Europe and uses the EUPHEMIA algorithm to match bids and offers and allocate capacity between all participating market areas. XBID is the single intraday solution and is based on a continuous process as opposed to a single calculation as in day-ahead coupling.

In order for the European Target Model to be fulfilled, the interconnectors or TSOs must make capacity available for implicit allocation via the single day-ahead and single intraday solutions. Shipping is the process that happens after the capacity has been allocated. On behalf of the capacity owner, the appointed NEMO in its role as central counterparty (CCP) concludes the process through nominating the net position, financially settling with the CCP on the other side of the interconnector and calculating and collecting the congestion income for the capacity owner.

The congestion income accrues due to difference in the prices at either end of the interconnector that arise when the flow on the interconnector is congested, and is paid to the interconnector owner/operator as a return for making the interconnector capacity available for coupling.

EirGrid and SONI were each designated as a Nominated Electricity Market Operator (NEMO) under CACM in 2015 for Ireland and Northern Ireland respectively. They were designated on the basis that EirGrid and SONI intend to work together to jointly deliver NEMO services for the SEM across the island of Ireland bidding zone, through an appropriate joint arrangement. These services will be carried out under a contractual joint venture called SEMOpx. As permitted under Article 81 of CACM, SEMOpx has delegated its NEMO tasks as CCP to its sub-contractor, ECC, a well-established CCP operating in a number of countries throughout Europe.

Article 77 of CACM gives the NEMO, or its delegated Central Counter Party (CCP), the right to recover the cost of providing cross-border clearing and settlement services to the capacity owners through a fee or through another mechanism to be determined by the National Regulatory Authority. The article also gives the National Regulatory Authorities the right to approve cross-border clearing and settlement arrangements. The article states:

“1. All costs incurred by central counter parties and shipping agents shall be recoverable by means of fees or other appropriate mechanisms if they are reasonable and proportionate.

2. The central counter parties and shipping agents shall seek efficient clearing settlement arrangements avoiding unnecessary costs and reflecting the risk incurred, the cross-border clearing and settlement arrangements shall be subject to approval by the relevant national regulatory authorities.”

As the CCP carrying out the shipping tasks, ECC will recover its costs in performing the CCP tasks by the means of fees charged in accordance with paragraph 1 of Article 77 of CACM.

This paper describes the cross-border clearing and settlement arrangements that are being put in place by SEMOpx and ECC, as the CCP, and demonstrates that they are efficient, avoid unnecessary costs and reflect the risk incurred. SEMOpx therefore seeks the approval of these proposed arrangements by CER and UR as the relevant national regulatory authorities.

### 3 CACM Roles and Responsibilities

CACM identifies a number of roles and responsibilities for the process of cross-border capacity allocation and clearing and settlement arrangements. CACM governs those borders that are part of the single day-ahead and/or single intraday solution. Therefore, when putting cross-border arrangements in place on those borders, it is necessary to comply with the relevant articles in CACM. This section sets out the relevant articles that the SEM-GB clearing and settlement arrangements must satisfy.

Article 7 of CACM lists the NEMO tasks within the day-ahead market. The NEMO is responsible for taking on the role of market operator and also settling and clearing the contracts resulting from the trades. The role of Shipper is assigned to the NEMO through Article 7(1)(g) which states that NEMOs will be responsible for “acting as central counter parties for clearing and settlement of the exchange of energy resulting from single day-ahead and intraday coupling in accordance with Article 68(3)”.

Article 68 outlines the responsibilities that are put on the NEMO in its role as CCP and Shipper. The role of CCP has both local and cross-border tasks. The CCP is expected to act as counter party to the market participants for all their trades with regard to the financial rights and obligations arising from these trades. The CCP will provide a suite of services to its members which will ensure that each member’s matched orders are cleared and settled in a timely manner. The CCP shall ensure the anonymity of each of its members while carrying out these tasks. The CCP is only responsible for the “financial rights and obligations arising from these trades”. The responsibility of physically delivering the electricity does not lie with the CCP.

Article 68(3) introduces the cross-border task assigned to the CCP and states: “central counter parties shall act as counter party to each other for the exchange of energy between bidding zones with regard to the financial

rights and obligations arising from these energy exchanges”. This role is known as the role of Shipper and can be carried out in a number of different ways which will be explored in Section 5.

Article 68(4) identifies the information that the CCP should take into account when acting as Shipper. The Shipper shall take into account, “the net position for each bidding zone and market time unit<sup>1</sup>”. In addition, the scheduled exchanges<sup>2</sup> may be taken into account. The scheduled exchanges, if applicable, will be calculated by the TSO according to Articles 43 and 49 for the day-ahead market.

In addition, Article 68(5) requires that each central counter party shall ensure that for each market time unit:

- a. “across all bidding zones, taking into account, where appropriate, allocation constraints, there are no deviations between the sum of energy transferred out of all surplus bidding zones and the sum of energy transferred into all deficit bidding zones
- b. Electricity exports and electricity imports between bidding zones equal each other, with any deviations resulting only from considerations of allocation constraints, where appropriate”.

Article 68(5)(a) refers to all bidding zones being coupled through the single day-ahead coupling. The Shipper must ensure that the import and export positions across those bidding zones match each other. In other words, if each net position for each coupled bidding zone was added together the answer would be zero, taking into account the difference due to allocation constraints (e.g. losses, ramping).

Article 68(5)(b) refers to a bidding zone border and the associated volumes. The CCP must ensure that the export from the bidding zone on one side of the border equals the import into the bidding zone on the other side of the border. Differences between export and import volumes could occur due to TSO allocation constraints, such as cable losses or ramping constraints. In exceptional circumstances (Force Majeure, emergency situations), which result in curtailment of allocated cross-zonal capacities, the TSO shall ensure that the CCP or Shipping Agent shall not be subject to financial damage or benefit arising from any imbalance (Article 77(3)(a)). The CCP is only responsible for settling the financial rights and obligations resulting from capacity allocation. These articles do not refer to the obligation to physically deliver the electricity in real time.

As Shipper, the CCP has the responsibility of collecting congestion income (Article 68(7)) and transferring it to the TSOs (Article 68(8)) or another entity designated by the TSOs to receive congestion income on their behalf. CACM provides that the congestion income is transferred to the TSO no later than two weeks after the date of settlement.

Where there are different CCPs on a border, CACM Article 68(6) allows for a third party called a “shipping agent” to carry out the responsibilities in Article 68 by acting as a counter party between the CCPs.

### 3.1 Shipping Activities

At its simplest, shipping can be summarised into three main activities:

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<sup>1</sup> Article 68(4) cross-references the requirements set out in Article 39(2)(b).

<sup>2</sup> According to CACM, scheduled exchange means an electricity transfer scheduled between geographic areas, for each market time unit and for a given direction.

- a) Physical settlement
- b) Financial settlement
- c) Congestion income collection

#### **a) Physical Settlement**

Physical settlement is carried out through the submission of cross-border nominations to the TSO or other responsible entity. As described in Article 68(4) the sum of cross-border nominations for all coupled bidding zone borders per bidding zone must equal a single net position for each bidding zone and must take the scheduled exchanges into account, where applicable. Physical settlement is also governed by Article 68(5).

#### **b) Financial Settlement**

The CCP carries out financial settlement by netting its financial position with the other CCP(s) in its region. This responsibility is governed by Article 68(3).

#### **c) Congestion Income Collection**

As described in Article 68(7) and (8), the CCP is responsible for collecting the congestion income and transferring it to the TSOs.

## **4 SEM-GB Roles and Responsibilities**

CACM only refers to the roles of NEMOs and TSOs. The SEM-GB topography differs from much of mainland Europe. The SEM and GB are connected via DC cables which are independent from the national TSO. Many European countries are connected by AC lines which are owned and operated by the TSOs. Therefore, it is important to set out how CACM applies to the parties that are involved in the SEM-GB arrangements. For the purposes of shipping, when CACM refers to the TSO, it is referring to the capacity owner. In the case of the SEM-GB border this is the Interconnector Owner (ICO). Article 81 of CACM allows for the delegation of tasks. The ICOs have appointed the Joint Allocation Office (JAO) as their service provider for a number of cross-border services including the distribution of congestion rent. SEMOpX has delegated its task of central counter party to ECC.

EirGrid and SONI will act on behalf of the ICOs to send the available capacity and allocation constraints (losses, ramp rate) to SEMOpX within the timelines set out by the SEM-GB procedures.

SEMOpX, as NEMO, will facilitate the allocation of capacity by entering the capacity and allocation constraints information into its order books. By doing this, the capacity and allocation constraints information will be entered into the EUPHEMIA algorithm. Upon completion of coupling using the PCR procedures, SEMOpX will inform the Interconnector Management Platform which is operated by EirGrid and SONI of the results of the coupling process and therefore the capacity that was allocated through this process. SEMOpX will also provide the exchange rate for the coupling process that is needed as a result of the dual currency SEM market and for the GB market. The functions to allocate capacity as outlined are a service provided by the NEMO to the capacity owner.

ECC, as CCP will carry out the shipping activities including the collection of congestion income for the ICOs. Throughout the process the ICOs have retained ownership of the capacity and therefore ownership of the congestion income. As part of its role as service provider to the ICOs, JAO will receive the congestion income from ECC and distribute it in accordance to the agreement it has in place with the ICOs. The congestion rent that is collected from GB and from Northern Ireland will be in British Pounds. ECC will convert this to Euro as this is the currency that JAO operates in.

To complete the physical settlement aspect of shipping, SEMO and Elexon as balancing market operators in the SEM and GB respectively must receive the cross-border nominations.

## 5 Shipping in Europe

This section summarises the different approaches that have been put in place by various NEMOs to facilitate cross-border capacity allocation. By examining the different options that have been put in place in Europe it was possible to identify which model was the most efficient fit for the SEM-GB border.

### 5.1 NEMO Cross-Border Services

Capacity is allocated through regional coupling. Regional coupling can be divided into three sections:

1. **Pre-coupling:** the capacity owner submits the available capacity and allocation constraints to the NEMO
2. **Coupling:** the Market Coupling Operator (MCO) performs the Market Coupling tasks (today done via the PCR)
3. **Post-coupling:** includes physical and financial shipping, risk controlling for counterparty risk and congestion income collection and transfer to the TSOs.

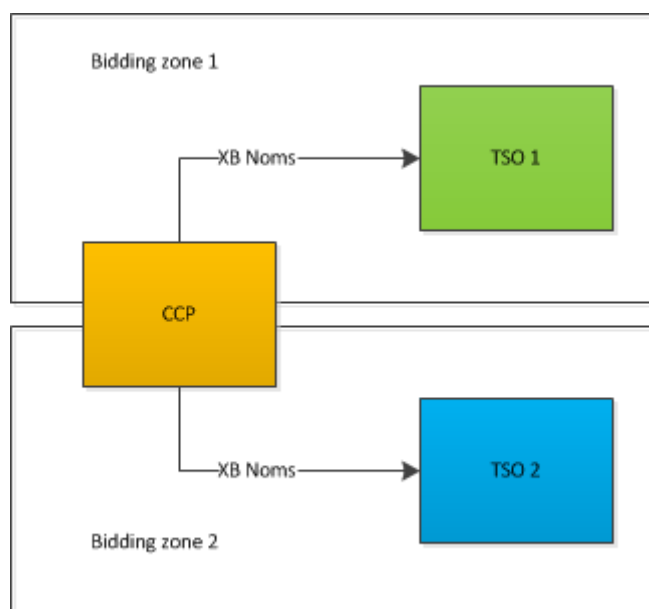
Across Europe, NEMOs have taken two main approaches to providing the regional coupling or cross-border services. Some NEMOs, for example Nord Pool, provide an end-to-end service to the capacity owners which includes the submission of the capacity and allocation constraints into the NEMO order books through to the completion of shipping. Other NEMOs have elected to delegate its CCP functions to third parties, for example EPEX SPOT has delegated its CCP tasks to ECC. In this case, the NEMO provides the pre-coupling and coupling services to the capacity owner and the appointed CCP provides the post-coupling services to the capacity owner.

### 5.2 Shipping Solutions Used in Europe

#### a) Intra Central Counter Party

The intra-CCP solution can be used where the CCP on both sides of the interconnector is the same entity. For example, this solution is used on the border between Germany and France where ECC is the CCP on both sides. This is demonstrated in Figure 1. The financial settlement and congestion income collection is carried out within the CCP itself and the CCP submits the cross-border nominations to the relevant TSO or relevant entity.

The benefit of using the intra-CCP model is that the internal cash flows mean that there are no additional cross-CCP collateral requirements for clearing of transactions between different NEMOs. This model makes use of existing processes and resources and does not require new contractual arrangements between CCPs. However, as mentioned, this model can only be implemented where the same CCP is on either side of the border.



**Figure 1: Intra-CCP Shipping Model**

### **b) Cross Central Counter Party**

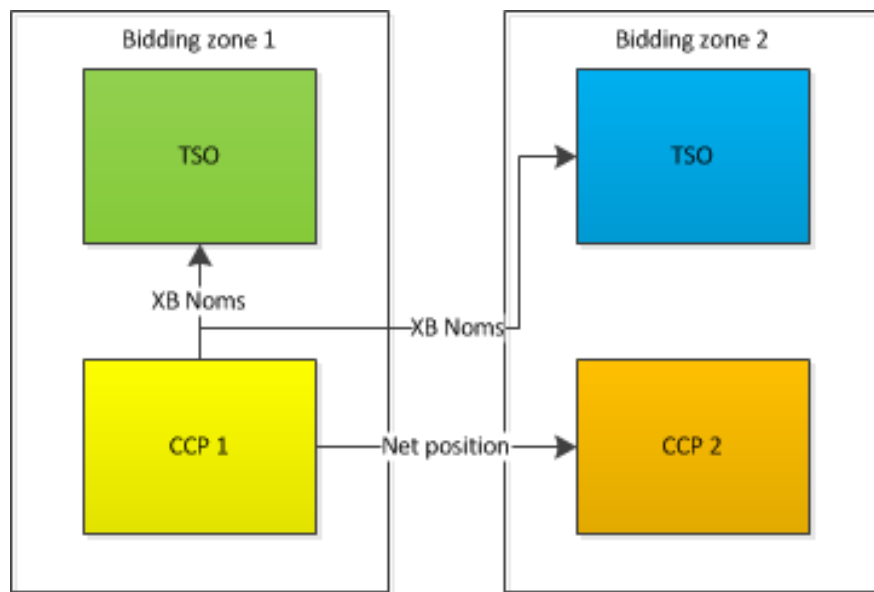
The Cross-CCP solution is implemented where there are different CCPs on each side of the border. For example, this model has been implemented on the border between France and Great Britain where ECC is the CCP in France and Nord Pool is the CCP in Great Britain. Each CCP is responsible for settlement of their local trades. To ensure each CCP has adequate funds to settle local trades, the CCPs settle their net position with each other.

A cross-CCP solution requires, inter alia, a Cross-CCP Settlement Agreement including the collaterals<sup>3</sup> for counterparty risk (based on net exposure), a settlement bank infrastructure and pre-financing to bridge payment cycles.

Figure 2, below, shows an example of a cross-CCP model. In this example bidding zone 1 is exporting to bidding zone 2. As a result the CCP in bidding zone 1 is responsible for the submission of the cross-border nominations to the TSO (or other relevant entity) in both bidding zones.

<sup>3</sup> The purpose of collateral is to cover the financial risk posed to the CCP, Shipper or Clearing Party by the non-performance of the counterparty.





**Figure 2: Cross-CCP Shipping Model**

### c) Shipping Agent

A Shipping Agent may be employed where there are different CCPs on each side of the border. The Shipping Agent would become a member of both the CCPs and would buy and sell from the CCPs. Since the shipping agent is acting as counter party to each of the CCPs, it guarantees CCP 1 that it will be paid the amount CCP 2 owes and vice-versa. To minimise this risk to the CCPs, the Shipping Agent would provide collateral based on gross exposure to each of the CCPs. With this option, the Shipping Agent may also need to pre-finance differences in the CCPs' payment cycles.

Figure 3 gives an example of the Shipping Agent model as is seen in the North-West Europe (NWE) region Multi-NEMO Arrangements proposal. In this example, bidding zone 1 is exporting to bidding zone 2. The Shipping Agent is responsible for financially settling the appropriate buy and sell positions on each CCP, the submission of the cross-border nominations to the TSO and the collection of congestion income and submission of same to the TSO. The same model could be put in place for a single CCP on either side of the border.

The Shipping Agent is providing a service to the capacity owners and would charge accordingly. These charges would also reflect the fee that the Shipping Agent receives from the CCP as a member. There would be contracts put in place that outline the roles and responsibilities in the shipping solution.

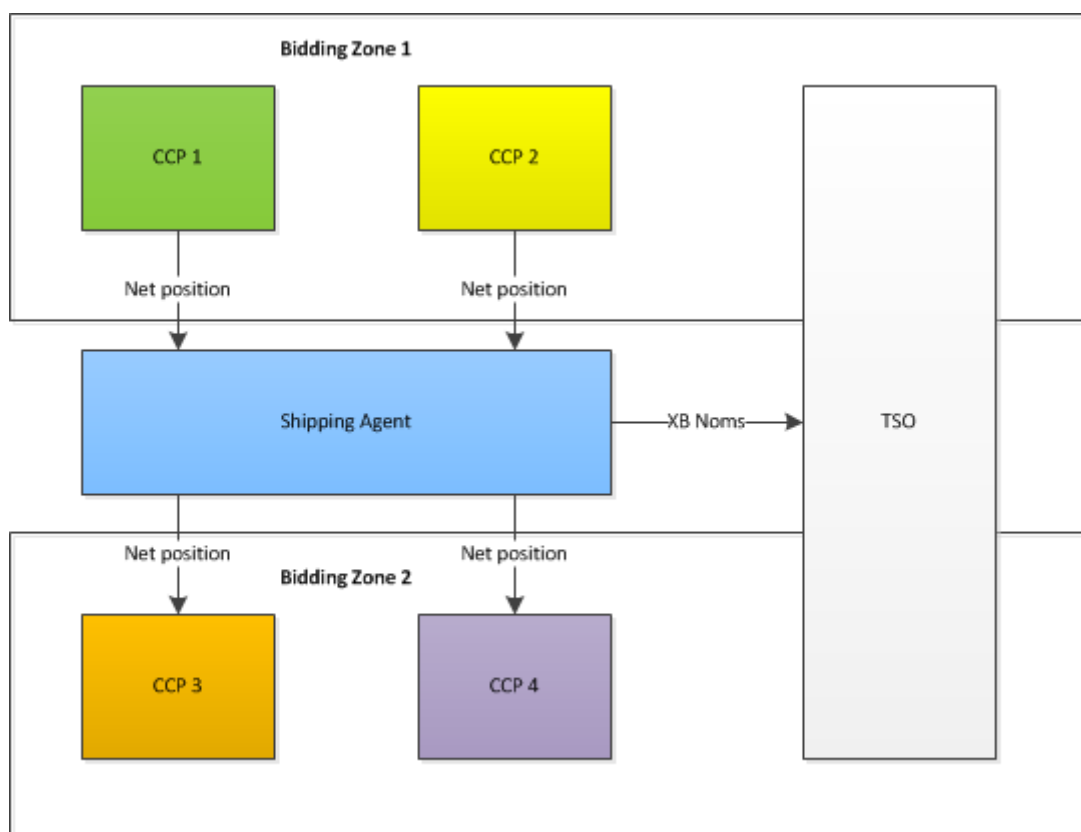


Figure 3: Shipping Agent Example

### 5.3 Summary

The purpose of the following tables is to summarise the differences between the shipping models that are presented above and to compare the efficiency of each.

**Table 1: Comparison of shipping models**

Cost type	Intra-CCP	Cross-CCP	Shipping Agent
Implementation costs	Y	Y	Y
Operational costs	Y	Y	Y (membership with each CCP)
Cost for daily cash transfer (banking services)	No	Y	Y
Pre-financing payment cycles	No	Y	Y
Cost of collaterals	No	Net value	Gross value
Total cost (relative)	Lower	Medium	Higher

**Table 2: Comparison of the different shipping models from the point of view of contractual and operational arrangements**

	Contractual Arrangements	Operational Arrangements
Intra-CCP	No additional contracts needed as this is internal cash flows	Existing, internal processes
Cross-CCP	Contracts necessary Pre-financing and collaterals arrangements necessary	Need to agree on who makes the nominations and when Agree on process for netting Agree who collects congestion rent, how and when. Collaterals arrangements.
Shipping Agent	Contracts necessary Pre-financing and collaterals arrangements necessary SA needs to become member of the CCPs	SA operates under each local CCP rules and manages the differences between each CCP. Collaterals arrangements.

Table 1 demonstrates that the intra-CCP model is the lowest cost of the 3 models. Since a single company is effectively performing the shipping task there is no need for bank transfers, collaterals or pre-financing cycles. In addition Table 2 summarises the contract and operational arrangements complexity. By using the same CCP

on both sides of the border, the intra-CPP model, the contractual and operational arrangements are simplified. Both tables demonstrate that the intra-CCP model is the most efficient model where it is possible to have the same CCP on either side of the border.

## 6 The SEM-GB Shipping Solution

This section sets out the solution to be adopted for clearing and settlement in the SEM, and shipping for the SEM-GB border. The purpose of this section is to demonstrate the decisions that have been made to ensure that the shipping model for the SEM-GB border is efficient, avoids unnecessary costs and reflects the risk incurred.

### 6.1 Competitive Tender

ECC was appointed by SEMOpx through a competitive tender process. ECC (along with EPEX SPOT) was selected by the SEMOpx as it is a best practice organisation with substantial European experience. By choosing ECC, SEMOpx is able to leverage economies of scale, existing solutions, processes, expertise and resources.

### 6.2 Intra-CCP Model Adopted – for DAM & IDM

For I-SEM go-live, ECC, as the delegated CCP for SEMOpx, will put in place the intra-CCP shipping model to take advantage of its existing role as CCP in Great Britain. Of the three models outlined in Section 5, intra-CCP is the most efficient taking into account the cost, contractual arrangements and processes. Using ECC on both sides of the border avoids the need for the CCP or Shipping Agent to post collaterals, pre-financing requirements, additional payment infrastructure (settlement bank) or development of additional contracts. The Intra-CCP model leverages ECC's existing processes and resources.

CACM provides for a single European day-ahead and intraday coupling solution, with a day-ahead auction and intraday continuous trading. The single intraday solution relies on the use of XBID which will not be available to the SEM for the go-live date of 23 May 2018. The I-SEM arrangements will, therefore, go-live with the single day-ahead solution and an interim intraday solution, involving coupled intraday auctions and a local intraday continuous market. The same cross-border clearing and settlement solution as proposed above will be used for the day-ahead and interim intraday markets and will also continue to be applicable when XBID becomes available to the SEM and the single intraday continuous coupled solution is implemented.

### 6.3 Cross-Border Nominations

As part of the SEM-GB shipping arrangements, EirGrid/SONI will submit the cross-border nominations to Elexon. This will make use of existing interfaces and arrangements between the SEM SOs and National Grid. This solution avoids the need for ECC to set up new interfaces and is in line with CACM provisions as outlined above.

## 6.4 ECC Requirements and Fees

ECC intends to charge a fee for the shipping services provided. It is intended this fee is charged to the ICOs as the recipients of this set of services<sup>4</sup>.

In coupled markets, it is likely that there will be a net import or export to or from each coupled market. For local contracts, the CCP clears the contract on both the generator (sell) and supplier (buy) side. However, for the net import from GB the CCP will only clear the buy side of the contract and only clear the sell side of a product in the net export (i.e. export from SEM) market. Thus, where there is import or export to or from the SEM, the SEM CCP will hold an unmatched buy or sell contract quantity. Conversely, the GB CCP (either ECC or Nord Pool) will also hold an equivalent and opposite unmatched sell or buy contract quantity. Each CCP will charge fees based on the import or export quantity from their market area but will not be able to charge fees for the unmatched contract quantity in the other direction (since this will be an export or import in the other CCP's market area).

For ECC to provide the shipping services to the ICOs, and charge fees to recover the costs of those services, the ICOs or a designated ICO entity acting on the ICOs' behalf must become a member of ECC. This is required to benefit from ECC's risk minimisation services as a CCP. ECC offers different access models to its members, allowing it to benefit from specific legal protection in case of insolvency (based on its status as a payment system) and providing its members a dedicated infrastructure for risk mitigation in case of member default (default waterfall). Moreover, establishing a payment infrastructure for financial settlement of cleared transactions requires adherence to ECC's and associated clearing member banks' or settlement banks' payment terms and to use the reliable interbank TARGET2 infrastructure for all financial settlements (all congestion rents will be paid out in EUR).

## 6.5 Long Term Arrangements

The intra-CCP model is the most efficient model where there is the same CCP on both sides of a border. The Intra-CCP model may continue to remain the most efficient option under Multi-NEMO Arrangements (MNA) given the topology of the SEM-GB region. However, it is not possible to pre-empt the MNA design and whether the intra-CCP model would be compatible with it. Under the MNA design, roles and responsibilities may change and accordingly the shipping model may need to respond. The optimal solution would need to be assessed at the time of designing the MNA.

## 7 Conclusion

Article 77 of CACM provides for the National Regulatory Authorities to approve the cross-border clearing and settlement arrangements. The purpose of this paper is to demonstrate to the CER and UR that the cross-border clearing and settlement services that are being put in place by SEMOpx and ECC are efficient, avoid unnecessary costs and reflect the risk incurred and therefore satisfy the requirements of Article 77. SEMOpx has demonstrated these requirements through the appointment of ECC, a best practice CCP, on both sides of the interconnector in the intra-CCP model. The paper demonstrates that for SEM-GB arrangements the proposed intra-CCP model is the most efficient of the three models used in Europe. Under this model, SEMOpx

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<sup>4</sup> SEMOpx notes that Moyle is seeking clarity from the Regulatory Authorities on this point.

and ECC will avoid unnecessary costs by using existing process and interfaces where possible e.g. EirGrid and SONI are submitting the cross-border nominations on behalf of ECC.

As provided for in Article 77, ECC will recover the costs it incurs in providing shipping services through a fee to the customer, the interconnector owners as the capacity owner. The fees are set to reflect ECC's costs and risks in providing these services, are transparent and are consistent with other fees across Europe.

SEMOpX requests that the CER and UR confirm their approval of the cross-border clearing and settlement arrangements as per Article 77.