

SEM Committee

Directed Contracts

Consultation paper on the Treatment of Interconnection for Market Concentration

12th September 2012

SEM-12-086

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1 Executive Summary

- 1.1 On 26 June 2012 the SEM Committee (SEMC) published its decision paper on "Directed Contracts - Q4 2012 to Q3 2013 - Quantification and Pricing for Initial "Front Loaded" Auction" (SEM/12/048). This consultation paper fulfils the commitment given in that decision paper for the SEMC to publish a consultation paper on how interconnectors should be treated in future modelling for the purpose of Directed Contracts.
- 1.2 Section 2 of this document provides a brief overview of the SEMC and the Market Power Mitigation tools are employed in the market.
- 1.3 Section 3 provides an overview of the role of Directed Contracts, how the price and quantities of these contracts are calculated and the calculation of Directed Contract eligibility.
- 1.4 Section 4 sets out how interconnection is currently treated for the purpose of calculating Directed Contracts. The consultation paper also sets out previous decisions taken in relation to the treatment of interconnection. These decisions taken were based on interconnection only allowed for 400MW of import to the SEM and 80MW of export. Since the initial work on Directed Contracts began the Moyle interconnector has increased both its import capacity (now 410MW in summer and 450MW in winter) and its export capacity (now 300MW). In addition to this the new East-West interconnector, due to go live shortly, will contribute another 500MW of import capacity and 500MW of export capacity to the island. In light of these changes this consultation paper aims to ensure interconnection is treated appropriately in the Directed Contracts process.
- 1.5 Section 5 Sets out a description of the options currently being considered by the SEMC as well as some of the benefits and drawbacks of each option. These options are as follows:
 - Option 1 – Status Quo
 - Option 2a – Reflect the modeled import flows in the Concentration Model
 - Option 2b – Reflect the modeled import flows in the Concentration Model using SMP +5%
 - Option 3 – Treat each interconnector separately in the modeling, and reflect modeled flows
 - Option 4 – Use historic flows to represent competitive capacity in the Concentration Model

- Option 5 – Wait 6 to 12 months

1.6 The SEMC is seeking views on all aspects of the proposals put forward in this Consultation Paper, as well as any additional options that respondents would like to be considered, e.g. a combination of any of the options put forward. All responses should be addressed to:

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1.7 The SEMC intends to publish all comments received. Those respondents who would like certain sections of their responses to remain confidential should submit the relevant sections in an appendix marked confidential together with an explanation as to why the section should be treated as confidential.

2 Background

- 2.1 On 26 June 2012 the SEM Committee¹(SEMC) published its decision paper on” Directed Contracts - Q4 2012 to Q3 2013 - Quantification and Pricing for Initial “Front Loaded” Auction” (SEM/12/0482). This consultation paper fulfils the commitment given in the decision paper for the SEMC to publish a consultation paper on how interconnectors should be treated in future modelling for the purpose of Directed Contracts.
- 2.2 Since 1st November 2007 the Northern Ireland Authority for Utility Regulation (NIAUR) and the Commission for Energy Regulation (CER), together referred to as the Regulatory Authorities (RAs), have jointly regulated the all-Island wholesale electricity market known as the Single Electricity Market (SEM) covering both Northern Ireland and the Republic of Ireland.
- 2.3 The SEM includes a centralised gross pool (or spot) market which, given its mandatory nature for generators and suppliers, is fully liquid. In this pool electricity is bought and sold through a market clearing mechanism, whereby generators bid in their Short Run Marginal Cost (SRMC) and receive the System Marginal Price (SMP) for each trading period for their scheduled dispatch quantities. Generators also receive separate payments for the provision of available generation capacity through a capacity payment mechanism, and constraint payments for differences between the market schedule and the system dispatch. Suppliers purchasing energy from the pool pay the SMP for each trading period along with capacity costs and system charges. The SEM rules are set out in detail in the Trading and Settlement Code (the TSC).

¹ The SEM Committee is established in Ireland and Northern Ireland by virtue of section 8A of the Electricity Regulation Act 1999 as inserted by section 4 of the Electricity Regulation (Amendment) Act 2007, and Article 6 (1) of the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 respectively. The SEM Committee is a Committee of both CER and NIAUR (together the RAs) that, on behalf of the RAs, takes any decision as to the exercise of a relevant function of CER or NIAUR in relation to an SEM matter.

² Decision Paper on Directed Contracts Version 2 – [SEM/12/048](#).

2.4 In designing and developing the SEM in the lead-up to its go-live in November 2007, the RAs were aware of the fact that a key issue which needed to be addressed was the risk of the exercise of market power or abuse of dominance in the SEM. This was as a result of the existence of two large incumbent electricity groups on the island - ESB and Viridian – and their potential ability to exercise market power. In order to address this, the RAs decided that it was necessary to put in place a specific Market Power and Dominance Strategy as part of the regulation of the SEM. The market power mitigation measures are referred to in consultation AIP/SEM/02/06³ and decision AIP/SEM/31/06⁴, further details on Directed Contracts is available in AIP/SEM/115/06⁵, AIP/SEM/165/06⁶, and AIP/SEM/244/06⁷. The measures are summarised below:

- Bidding principles for generators, i.e. a Bidding Code of Practice which states that generators must bid in the SRMC to the wholesale pool;
- An RA Market Monitoring Unit to monitor adherence by generators to the bidding principles and to conduct market abuse investigations as needed;
- Directed Contracts (or DCs) to be offered to the market by incumbent generators with the potential to exercise market power.
- Ring-fencing arrangements between affiliated generating and supply businesses within the ESB and Viridian groups, provided for in their licences.
- Local power mitigation measures, if deemed necessary.

2.5 Further information on Market Power, and the Market Power Mitigation Strategy employed by the Regulator Authorities is available in “SEM Market Power & Liquidity State of the Nation Review, An Information Paper” SEM/10/057, 23rd August 2010⁸.

2.6 This paper deals with market power in relation to DCs only, with a particular focus on how interconnectors impact on the ability to exercise market power in SEM and therefore in the determination of DC quantities.

³ Market Power Mitigation in the SEM, 1st February 2006 AIP/SEM/02/06

⁴ Market Power Mitigation in the SEM Decision Paper, 7th April 2006, AIP/SEM/31/06

⁵ Market Power Mitigation in the SEM - Directed Contracts: Price, Form and Allocation: Decision Paper, 8th September 2006, AIP/SEM/115/06

⁶ Market Power Mitigation in the SEM - Directed Contracts: Price, Form and Allocation: Supplemental Decision Paper, 3rd November 2006, AIP/SEM/165/06

⁷ Market Power Mitigation in the SEM: Directed Contract Quantification Methodology Consultation Paper, 22nd September 2006, AIP/SEM/144/06

⁸ http://www.allislandproject.org/en/market_decision_documents.aspx?article=dcdad63-660c-4b28-b71f-9896f306e6cc

2.7 An overview of DCs is set out in section 3 of this paper, including an overview on the calculation of quantities and prices. Section 4 of this paper sets out how interconnectors are currently treated for market concentration and therefore DC quantity purposes. Section 5 sets out a number of options for how interconnectors could be treated in the future for measures of market concentration/power and DC volumes, showing some key advantages and disadvantages with various options.

3 Directed Contracts

- 3.1 DCs are Contracts for Differences (CfDs) which are imposed on the incumbent generators with market power in the SEM by the RAs as part of the RAs' Market Power Mitigation Strategy.
- 3.2 DCs are a mandated set of CfDs implemented at the direction of the RAs on entities with market power in the SEM wholesale pool. As they are "directed", it is the RAs who decide upon the methodology, pricing and quantity of these DCs every year. The intent of these contracts is effectively to reduce the amount of generation that such entities will be receiving spot based prices for through the SEM. The quantity of generation that the entities will offer to the market and receive spot-based prices for will therefore be the difference between the generation that they control and the DC quantities - i.e., the "uncontracted generation position". The quantity of contracts directed by the RAs is determined, via the Herfindahl Hirschman Index (HHI), so that the concentration of this "uncontracted generating position" is likely to result in a competitive market outcome given the other elements of the market power mitigation package as well as the design features of the SEM.
- 3.3 The DCs mitigate market power by reducing the incentive for the generators deemed to have market power to submit bids into the wholesale pool above (or below) competitive SRMC levels for the purpose of influencing either pool (SMP) prices or (as a result) future contract prices. This is because the RAs set the DC price, quantity and eligibility and so if the generators do this, they will then lose money on the CfDs which are attached to these bids and so are no better off setting the price higher than SRMC.
- 3.4 DCs Price
 - The RAs determine the price of the DCs each year. Using a validated Plexos model, and by populating it with fuel/CO2 scenarios, the RAs develop a regression pricing formula for each of the DC products by quarter. This formula is used to price the DCs when suppliers subscribe to the quantity for which they are eligible during the DC subscription process.

3.5 Directed Contract Quantities

- The RAs calculate the quantity of DCs that dominant generation businesses are required to make available to eligible suppliers each year using the HHI as a measure of market concentration⁹. DC quantities are determined using the HHI for 3 different generation market segments: baseload, mid-merit and peaking, with each examined by quarter in the tariff year. The target HHI for each of these segments is set by the RAs and for each year since the SEM has been set at 1,150. The DC quantities for those with a dominant position are set such that market concentration in the SEM (as calculated by the model) is below this threshold. The process works as follows:
- The RAs input fuel data into a validated Plexos model to give a forecast of half-hourly SMPs and Wind/Hydro Generation. For each half hour the “Market Concentration” is calculated via the RA’s Concentration Model. Only potentially competitive capacity is counted for market concentration calculations, defined as forecast generation output with cost less than or equal to $1.05 \times \text{SMP}$ - essentially each generator’s market share in the Concentration Model is based on the generator’s expected competitive capacity, which in turn is based on whether it is within the $1.05 \times \text{SMP}$ threshold (derived from PLEXOS runs).
- Using the competitive capacity information, the HHI is determined for the market to determine its concentration, divided into baseload, mid-merit and peaking by quarter.
- If the HHI exceeds the HHI threshold level of 1,150 for these segments, the incumbent with the largest baseload market share in that month (ESB or Power NI) is allocated 1% of said share as a DC quantity. This is repeated, with allocated DC quantities not contributing to the HHI, until the monthly baseload HHI is below this threshold level.
- The impact of interconnection on the Concentration Model and DC quantities is explained further in section 4.

⁹ Market Power Mitigation in the SEM Directed Contract Quantification Methodology Decision Paper, 8 December 2006, AIP/SEM/208/06

3.6 Directed Contracts Eligibility

- The RAs determine the eligibility of each supplier for DCs, calculating separately for each quarter and each product-type (baseload, mid-merit and peak). The volume of DC contracts by product type (baseload, mid-merit, peaking by Quarter) is allocated to suppliers based on their share of customers in each category in the market. Essentially a supplier's eligibility for a DC product calculated using their share of Maximum Import Capacity in each customer category, the profile of consumption in each customer category and the total annual consumption of each customer category.

4 Treatment of interconnection

- 4.1 The decision taken on market power mitigation in 2006 acknowledged that “it is unlikely for imports into Ireland to form a part of a market power exploitation strategy by any of the current participants in the market.”¹⁰ For that reason it was decided Moyle would be included in the Concentration Model as consisting of many small generators, For the purposes of calculating HHI, Moyle is included in the denominator but not the numerator, this is referred to as ‘atomising’ Moyle
- 4.2 Therefore, for the determination of market concentration estimates (and hence DC volumes) in the Concentration Model, interconnection is assumed to be available for import, i.e. is assumed to be 100% available to import or “100% competitive capacity”. This 100% availability to import assumption has been used since the introduction of DCs in SEM.^{11,12} The availability to import (i.e. maximum interconnection capacity) is one way of measuring the impact of interconnection on constraining market power. Interconnection provides a constraint on any participant in the SEM from raising prices, up to its available capacity. Interconnection helps mitigate against the exercise of market power to raise SMP in SEM given that such attempts could be thwarted by increased imports, thereby reducing SMP again, potentially up to the maximum capacity of the interconnector. Using interconnection maximum capacity, i.e. incorporating a geographical area consisting of SEM plus maximum interconnection capacity, could be considered consistent with other international definitions of relevant market for example the US Department of Justice defines a relevant market as:

“... a product or a group of products and a geographical area in which it is sold such that a hypothetical, profit maximising firm, not subject to price regulation, that was the only present and future seller of those products in that area would impose a ‘small but significant and non-transitory’ increase in price above prevailing or likely future levels”¹³.

¹⁰ “Market Power Mitigation in the SEM - Directed Contract Quantification Methodology Decision Paper” AIP/SEM/208/06, 8th December 2006, Section 3.6

¹¹ Market Power Mitigation in the SEM Decision Paper, 7th April 2006, AIP/SEM/31/06

¹² Market Power Mitigation in the SEM Directed Contract Quantification Methodology Decision Paper, 8 December 2006, AIP/SEM/208/06

¹³ Please see <http://www.justice.gov/atr/hmerger/11249.htm>

- 4.3 When considering interconnectors in the Concentration Model it was acknowledged that it would be difficult to accurately represent all participants bidding on the interconnector, and an “atomized” approach was adopted whereby the interconnector was considered to be contributing to total capacity in the denominator of the market share equation but to give it zero weight in the numerator. This is set out further in section 3.6 of AIP/SEM/208/06.
- 4.4 It was also acknowledged in section 3.6 of AIP/SEM/208/06 by the Regulatory Authorities that this will somewhat understate the contribution of these companies. It was considered unlikely that imports into Ireland would form a part of a market power exploitation strategy by any of the participants in the market.
- 4.5 This assumption was made at a time where the potential import to the SEM was limited to 400MW and the Maximum Export was 80MW.
- 4.6 Since the initial work on DCs began the Moyle interconnector has increased both its import capacity (now 410MW in summer and 450MW in winter) and its export capacity (now 300MW)¹⁴. In addition to this the new East-West interconnector (EWIC), due to go live shortly, will contribute another 500MW of import capacity and 500MW of Export Capacity to the island.
- 4.7 The Concentration Model does not differentiate between Moyle and EWIC.
- 4.8 The modelling work carried out by the Regulatory Authorities for the DC process for 2012/13 shows that EWIC and Moyle are expected to import over 70% of the time during 2012/13. However, it should be noted that this modelling assumption is based on Plexos assuming *no* exercise of market power in SEM. It should also be noted that the RA’s PLEXOS model uses a simplified proxy model of GB and fully flexible and responsive interconnectors. Its purpose is to forecast the SMP as accurately as possible, not interconnector flows.
- 4.9 Given the increase in interconnection to/from SEM, section 5 sets out a number of options for how interconnectors could be treated for future market concentration measures and DC volumes, showing some key advantages and disadvantages with various options.

¹⁴ Moyle Interconnector Limited, Interconnector Capacity Calculation, September 2011 <http://www.mutual-energy.com/Download/110930%20MIL%20SONI%20NG%20Capacity%20Calc%20combined%20Sept%202011.pdf>

5 Options for consideration

5.1 In considering the potential impact on market power the Regulatory Authorities would like to consider a number of options in how to treat Interconnection in the Directed Contract Concentration Model. Additionally some of the potential benefits and drawbacks of each option have been included.

5.2 Option 1 – Status Quo

- No changes to how Interconnectors will be treated in the Concentration Model. This will mean the interconnectors will be assumed to be competitive 100% of the time. Their full capacity will continue to be atomized.

Benefit of this approach

- This option would require no changes to the Concentration Model
- This option will have no impact on existing published volumes for any remaining DC auctions
- Continuity / Regulatory Certainty – Interconnectors have been treated this way since the start of SEM and market participants have raised no significant issues with it.
- This approach reflects the fact that interconnection mitigates against the exercise of market power to raise SMP in SEM given that such attempts could be thwarted by increased imports (reducing SMP), up to the maximum available capacity of interconnection. Hence, by taking into account the availability of interconnection for import when prices in SEM are greater than GB, this option arguably best reflects the beneficial impact of interconnection on competition and market concentration in SEM. It is also consistent with the definition of a relevant market shown in section 4.

Drawback of this approach

- This option may result in the Concentration Model not accurately reflecting the behaviour of the interconnectors,
- While SEM price is usually considered to be higher than GB price, there may be some occasions when SEM price is lower than GB price. This is not reflected in the current approach as the interconnector is not assumed to be available for export.

- As has been stated previously¹⁵, this option could underestimate market power

5.3 Option 2a – Reflect the modelled import flows in the Concentration Model

- Current modelling estimates that interconnectors will only be importing for 70%¹⁶ of the time. This option would propose that the atomization of the interconnector capacity should reflect this modelled expected value.
- It is possible that this option may have an impact on DC volumes to be offered

Benefit of this approach

- For the purposes of the Concentration Model the interconnectors will be assumed to be competitive 70% of the time. This will more accurately reflect the outcomes of the detailed modelling work conducted on 2012/13 prices (see section 4).

Drawback of this approach

- The proposed approach of using modelled flows, which assumes no exercise of market power in SEM, may understate the competitive capacity of the interconnector (by not accounting for availability) used in the Concentration Model
- This option does not account for availability for export or import, current changes to the market to reflect intraday trading may not be taken into account at this current time, this could result in over/under-estimating Directed Contracts

¹⁵ Market Power Mitigation in the SEM Decision Paper, 7th April 2006, AIP/SEM/31/06

¹⁶ This number is not fixed and may change over time subject to modelling assumptions

5.4 **Option 2(b) – Reflect the modelled import flows in the Concentration Model using SMP +5%**

- As with option 2a, this option would use modelled interconnector flows in the Concentration Model. The current Concentration Model assumes competitive capacity where modelled generator bids fall within 105% of SMP. The Interconnector is assumed to be 100% available even though it may not always be competitive.
- To address this issue this option proposes to rerun PLEXOS with the SEM SMP increased by 5% - and interconnector flows from this run would be used, this therefore addresses the concern where modelled flows may understate the competitive capacity of the modelled interconnector flows used in the Concentration Model.
- It is possible that this option may have an impact on DC volumes to be offered.

Benefit of this approach

- This treats modelled interconnector bids in a more equal manner to generators bids.
- This will more accurately reflect the outcomes of the detailed modelling work conducted on 2012/13 prices.
- It is likely that this option will more accurately reflect the market power of participants in the market.

Drawback of this approach

- The proposed approach of using modelled flows, which assumes no exercise of market power in SEM, may understate the competitive capacity of the interconnector (by not accounting for availability) used in the Concentration Model.
- This option does not account for complete availability for export or import.
- Current changes to the market to reflect intraday trading may have an impact on modelled Directed Contract volumes.

5.5 Option 3 - Treat each interconnector separately in the modelling, and reflect modelled flows.

- Building on the suggestions of options 2a and 2b, this option would model the two interconnectors separately to take account of the variance in losses across the two interconnectors. Losses on Moyle are 1.9% and losses on East-West Interconnector are 6%.
- It is possible that this option may have an impact on DC volumes to be offered.

Benefit of this approach

- By using the modelled bids for the interconnectors the Concentration Model will be able to more accurately reflect the competitive capacity of the interconnectors.
- This will more accurately reflect the outcomes of the detailed modelling work conducted on 2012/13 prices.
- It is likely that this option will more accurately reflect the market power of participants in the market, which will have an impact on Directed Contract volumes to be offered.

Drawback of this approach

- Additional work will be required to calculate future Directed Contract volumes and prices
- The proposed approach of using modelled flows, which assumes no exercise of market power in SEM, may understate the competitive capacity of the interconnector (by not accounting for availability) used in the Concentration Model. This option does not account for complete availability for export or import.
- Current changes to the market to reflect intraday trading may have an impact modelled Directed Contracts volumes.

5.6 Option 4 –Use historic flows to represent competitive capacity in the Concentration Model

- This option bases competitive capacity on actual flows rather than estimated flows. The actual flow recorded from Moyle in the previous year (when it is operational), would be used as well as an assumption of 100% competitive capacity for East-West interconnector in its first full year of operation. For all other years the competitive capacity assumption for East-West Interconnector shall be set equal to actual flows recorded in the previous year.
- It is possible that this option may have an impact on DC volumes to be offered

Benefit of this approach

- No additional modelling work required.
- This will base Directed Contracts on actual data rather than modelled data. Making the process more objective.
- This should make the Concentration Model approach more transparent as market data is publically available.

Drawback of this approach

- Interconnector flows would be backward looking based on actual historical data Directed Contracts are based on forecasts.
- This would not take account of changes to the generation mix or demand in the directed contract period.
- This approach would not initially account for impact of intra-day trading on flows, which could increase imports/exports, so could therefore over-estimate market power. There also would be a delay in accounting for changes in market conditions
- Assuming there was no market power exercised, historic flows are those that occurred without market power – as discussed earlier this is arguably irrelevant as it is the flows that would occur with market power being exercised that is more relevant. CEPA, in their analysis of market power and liquidity in SEM, found no evidence of market power being exercised.

5.7 Option 5 – Wait 6 – 12 Months

- This option would allow the RAs time to consider the impact of additional interconnection and intra-day trading on interconnector flows and bids. It would also allow the Regulatory Authorities further time to consider implementing any of the options above.

Benefit of this approach

- Allows for data to be collected on the new interconnector flows for East-West Interconnector.
- Allows for the evaluation of the impact of intra-day trading.
- This option would require no changes to the Concentration Model for now.

Drawback of this approach

- This option may result in the Concentration Model not accurately reflecting the behaviour of the interconnectors for a prolonged period.
- The assumption of 100% availability for import does not reflect the modelling results supporting the published Directed Contract volume and prices.
- This option does not take into account the differences in the two interconnectors.
- This option could underestimate market power.

6 Timelines

6.1 The consultation period will be 4 weeks.

7 Responding to this consultation

7.1 The Regulatory Authorities are seeking views on all aspects of the proposals put forward in this Consultation Paper, as well as any additional options that respondents would like to be considered, e.g. a combination of any of the options put forward. All response should be addressed to:

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7.2 The SEMC intends to publish all comments received. Those respondents who would like certain sections of their responses to remain confidential should submit the relevant sections in an appendix marked confidential together with an explanation as to why the section should be treated as confidential.