

SEM Committee Paper
Short to Medium Term Interconnector Issues in
the SEM

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Executive Summary

The SEM Committee (SEMC) as part of their work-plan for 2009 asked the Regulatory Authorities (RAs) for a paper setting out issues surrounding interconnector (IC) use in the SEM, prompted partly by a perception that use of the Moyle Interconnector had changed significantly after November 2007 and partly by a concern that the rules governing its use were contributing to security of supply concerns, particularly in Northern Ireland. This paper fulfils that request.

Interconnection between the SEM and the GB electricity market is set to increase over the coming years as efforts to create regional European markets gather pace. This paper addresses the current use of the Moyle Interconnector (IC) and rules applying to ICs in the SEM and identifies barriers to optimal IC usage and solutions to these in the short to medium term. While at present the only interconnector between the SEM and the GB markets is the Moyle, there are plans to construct three new ICs between Ireland and GB in the near future.

The SEM rules at present allow SEM participants with booked capacity on an IC to trade with neighbouring electricity markets, but were designed primarily to suit the Moyle IC. While it aims to comply where possible, the Moyle IC is not subject to EU rules on cross border electricity trading. In particular, SEM rules do not permit the reallocation of unused capacity to the market (UIOLI). Both the planned EirGrid East West IC due to be operational in 2012 and the two ICs that IMERA have indicated are to be commissioned in 2010 will be subject to EU rules on ICs. The SEM will need to be developed to conform to EU regulations and to maximise the benefits of increased interconnection.

The use of the Moyle IC to date provides a useful guide to how conducive the SEM and GB markets are to increased interconnection. Analysis has shown that since the SEM began only 25% of the variation in daily average imports can be explained by the variation in the daily average price differential; and that only 40% of the variation in exports can be explained by variations in the price differential. This suggests that, while the influence of price on flows across the Moyle IC is greater now than it was before the SEM began, flows in both directions across the Moyle have not responded as fully as they might to price arbitrage opportunities between the two markets since the SEM began.

The findings of the paper, that there are barriers to using the Moyle to exploit price arbitrage opportunities, are verified by discussions with existing and prospective participants. Key findings are that decisions on whether to trade across the IC are influenced by a number of factors other than the respective market prices, including the availability of capacity on the IC and its cost, the risks created by the misalignment of the SEM and GB markets (gate closure and ex-post pricing) and other trading risks such as the lack of liquidity in day ahead markets and network (triad) charging in GB.

In addition to the use of the IC by participants, the paper examines some options which would enable, in the interest of increasing security of supply and reducing the cost of constraints, the System Operators to make use of IC capacity within day (i.e. after gate closure) through more flexible means than currently exist. Further, with the prospect of increased interconnection in the medium term, the main barriers to increased IC use by

participants and the promotion of within day trading need to be addressed. It is intended that this will be done as part of a medium term plan to encourage market coupling with BETTA.

Key recommendations of this report are: the development of weekly or daily capacity auctions for the Moyle IC; allowing within day use of capacity on the IC by the System Operators; the need to address identified market misalignments between the SEM and BETTA that frustrate IC usage; the need to increase liquidity in both markets; and an intention to develop thinking on market coupling and intra-day trading on ICs between SEM and GB.

Anyone who has comments on this paper is welcome to send their comments to the Regulatory Authorities. The point of contact is Philip Newsome at the Commission for Energy Regulation (pnewsome@cer.ie).

1. Introduction

The SEM Committee (SEMC) has asked for a paper setting out issues surrounding interconnector (IC) use in the SEM, prompted partly by a perception that use of the Moyle Interconnector had changed significantly after November 2007 and partly by a concern that the rules governing its use was contributing to security of supply concerns, particularly in Northern Ireland.

In fulfilling this request, meetings have taken place with relevant market participants and analysis has been undertaken on IC usage to date. This Report presents the findings of this work and outlines key policy conclusions for SEMC consideration and recommended next steps.

This paper is presented against a background of a relatively new market, future increased interconnection between the island of Ireland and Great Britain in the medium term and within an EU policy context of greater regional electricity market integration supported by increased interconnection between Member States.

The matter of market coupling and the Single Electricity Market (SEM) will be the subject of a separate paper due to be presented to SEMC in July 2009.

The structure of the paper is as follows:

Paper Structure

Section 2 describes the background of the SEM market, future GB/Ireland interconnection projects and current relevant EU policy on interconnector access and use.

Analysis of flows across Moyle is presented in Section 3. Where possible, trends in IC use are related to the issues raised by market participants.

Section 4 summarises the key issues raised by market participants, other key stakeholders and system and market operators (see Annex for a list of those who were consulted).

The Report concludes in Section 5 by outlining recommendations for policy makers and next steps in this process to address IC issues identified by the RAs.

2. Background

2.1 The Single Electricity Market and Interconnectors

The Single Electricity Market (SEM) began on 1 November 2007. The SEM consists of a gross pool, into which all electricity generated on or imported into the island of Ireland must be sold, and from which all wholesale electricity for consumption on or export from the island of Ireland must be purchased.¹ Under the gross pool arrangements, a single system marginal price for electricity is determined on a half hourly basis based on generators' submitted bids and technical characteristics and the demand target to be met. Generators who are scheduled to run, as well as those whose capacity is available for dispatch, are paid a capacity payment. The SEM market design incorporates interconnection with other electricity markets².

The rules governing the operation of the SEM are set out in the Trading and Settlement Code (TSC) and a section of these rules governs how market participants use ICs. Key rules of relevance to this paper include:

Interconnectors and TSC Pricing Rules

The TSC requires the user of an IC to register an IC Unit in the SEM to allow them to trade between the SEM and neighbouring electricity markets.³ IC Units are settled as Predictable Price Maker Generators (PPMGs). This means that their Market Schedule Quantity (MSQ) and the market price (SMP) are not known until four days after the day to which the delivery of energy relates. The SEM is therefore an *ex-post* market, with a significant time lag between the submission of offers and real time dispatch and real time and the publication of market prices and MSQs. The SEM does not currently have a day-ahead market. This means that participants have no reliable indicator of SMP when settling their position in BETTA.

Whilst for the purposes of the TSC, IC Units are settled as PPMGs, their unique characteristics mean that they differ in some important respects from standard PPMGs. In the general case, a PPMG submits one set of Commercial Offer Data (COD)⁴ that applies to all trading periods within the trading day⁵. However, IC Units may submit separate COD to the market for each half hourly trading period, allowing them to reflect in their bid the flexibility of the IC and the dynamics of trading with another market.

A further important difference is that the Dispatch Quantities of an IC Unit are set at 12.00 on D-1. This means that IC Units know what their dispatch quantities on the following day will be in the SEM well before the day ahead market in Great Britain (GB) closes. But it also leaves them exposed to changes in prices in the day ahead market in GB for the two hours between 10 am and 12 noon. Standard PPMGs must hold prices firm for 20-44 hours and

¹ This is subject to a *de minimis* threshold of 10MW.

² As it stands, the SEM is physically interconnected with the British Electricity Trading and Transmission Arrangements (BETTA)

³ An IC User is a person who has entered into an agreement with an IC owner to use capacity on an IC and registered as such under the TSC

⁴ Note – Technical Offer Data are not submitted for IC Units

⁵ A Trading period in the SEM consists of 30 minutes. A Trading Day spans 6am to 6am the following day.

are therefore exposed to price risks, e.g. within day movements in gas prices, for considerably longer.⁶

Gate closure in the SEM

In the SEM, the submission of COD and Technical Offer Data (TOD) for all PPMGs, including IC Units, must be completed by 20 hours before the commencement of the Trading Day to which they relate. This means that bids pertaining to a given period in the BETTA market must be committed to in the SEM between 20 and 44 hours ahead. Gate closure in BETTA operates on a rolling one hour basis, meaning trading can take place up to an hour before real time. The disparate gates closures in BETTA and the SEM mean that trading between the two markets is compromised. This will be discussed in more detail below.

How the IC affects the SMP

IC Units may import into or export from the SEM. When importing, MW and MWh values associated with the IC Unit are positive; when exporting these values are negative. This means that an importing IC Unit receives an energy payment and capacity payment based on its MSQ and Dispatch Quantity respectively; and when exporting it pays an energy payment and receives a negative capacity payment based on the same. The effect that IC Units have on SMP therefore depends on the direction of their flow and MSQ.⁷

This means that IC Units importing power into the SEM will reduce, and IC Units exporting from the SEM will increase, the production costs of meeting demand in the *ex-post* unconstrained schedule. Reduced production costs are likely to be reflected in a lower SMP; and *vice versa*.

In recent months, IC Units have occasionally been the marginal unit in the SEM, setting the shadow price over a number of trading periods within trading days. This reflects the dynamics of IC units being included in the unconstrained schedule.

Capacity Payments

Under the TSC, capacity payments for IC units are based on the flow rather than real time availability profile. All types of IC Units are treated as Generator Units in that are paid a capacity payment, as set out under the Sections 4.95 to 4.124 of the TSC.⁸ For an

⁶ Though it is acknowledged that the risk of within day movements in the BETTA price is much greater than the risk of within day movements in gas prices

⁷ When the IC Unit is importing, it is dispatched based on its MIUNs (determined by the Interconnector Administrator using the outputs of the ex-ante market schedule adjusted to the technical characteristics of the IC) in real time to meet the demand in a given trading period. When the MSP Software is run four days after the trading day, an IC Unit is scheduled up to its MIUN to meet the Schedule Demand, providing that it is in merit. When an IC Unit is exporting, again it is dispatched according to its MIUNs set at 12 noon on D-1 and then scheduled as negative generation (i.e. its MSQ is negative) by the MSP Software. The MSP Software schedules an exporting IC Unit based on its PQ pairs, subject to the constraint that scheduled generation must equal scheduled demand, so positive generation will be brought on in the unconstrained schedule to meet the negative generation being exported by the IC. Exporting will therefore take place as long as the price of its replacement generation in the schedule is below the price of the exporting IC Unit.

⁸ The Eligible Availability, upon which capacity payments are calculated are determined for the various IC units as follows:

IU = Dispatch Quantity

IC Residual Capacity Unit (used for SO- SO trades) = Dispatch Quantity

IC Error Unit = Metered Generation / Trading Period Duration

importing IC Unit, the capacity payment is positive and for an exporting IC Unit, it is negative. Exporting IC Units are not therefore treated as if they were suppliers in the SEM.

Current Registered SEM Interconnector - Moyle

At present there is one interconnector between Ireland and GB (Moyle IC). The Moyle IC has a capacity of 500MW which at present is limited to a transfer capacity of 80 MW for exports⁹ and 450MW during the winter and 400MW during the summer for imports. While it is not classified as an IC under EU legislation (because it connects regions – Northern Ireland and Scotland - within a Member State) the Moyle IC has implemented some of the EU requirements for ICs such as third part access rights. Under its licence Moyle makes capacity available to the market in accordance with access arrangements which are subject to the approval of NIAUR.

SONI acts as Moyle's agent in implementing these access arrangements – the Moyle Interconnector Trading System (MITS). MITS is a computer system with interfaces to both the SEM and the BETTA markets and which calculates the Physical Notifications on behalf of IC Users and submits these to National Grid and Elexon (the market operator) in GB. MITS also applies rules to Interconnector Unit Nominations in order to produce Modified Interconnector Unit Nominations and submits these to both SEM and BETTA for scheduling and settlement purposes.

Capacity Booking -Moyle Auction Procedures

Products Sold

Moyle offers its available capacity to the market in long term (1-3 years) and short term (monthly at present) auctions. Capacity is sold on the terms of a standard contract ("the Moyle Interconnector Capacity Framework Agreement"). The terms of the auctions are set out in the Invitation to Bid documents published in advance each month by SONI.

The monthly capacity is sold in standard blocks of 5 MW. A non standard¹⁰ product was introduced to encourage use of the interconnector at a time when interest in using Moyle was low.

Auction Process

SONI act as auction agent for Moyle. All potential capacity holders must enter into an agreement with Moyle before their bid can be considered. The auction is a manual process, with paper bids being submitted by courier or post to SONI before 10am on the day of the auction.

Bids are opened by SONI in the presence of a representative of NIAUR.

⁹The trading capacity for west-east trades is 80MW at present, limited by Moyle's agreements for access to the GB transmission system.

¹⁰Users bidding for Monthly capacity on the Moyle Interconnector can bid for either standard capacity, which reserves a specified amount of MWs for the month, or non-standard capacity which reserves (and pays for) a minimum amount of MWh for the month, with any additional usage charged per MWh on a pay as you go basis. The non-standard product was over-subscribed in the March capacity auction.

Treatment of Unsold Capacity

To facilitate the use of Moyle if market conditions change in the short term potential capacity users may apply to Moyle to purchase unsold capacity within the month. If the offer price is greater than or equal to the average price paid at auction then Moyle may bi-laterally agree a sale. If the offer price is less than the average price paid at auction (or the reserve price if no bids were received) then Moyle *may* bi-laterally agree a sale but only after inviting offers from other potential interested parties and allocating available capacity on the basis of the highest price (value to Moyle) offered first.

Prices

A reserve price is set for each product in each auction. The current reserve prices are:

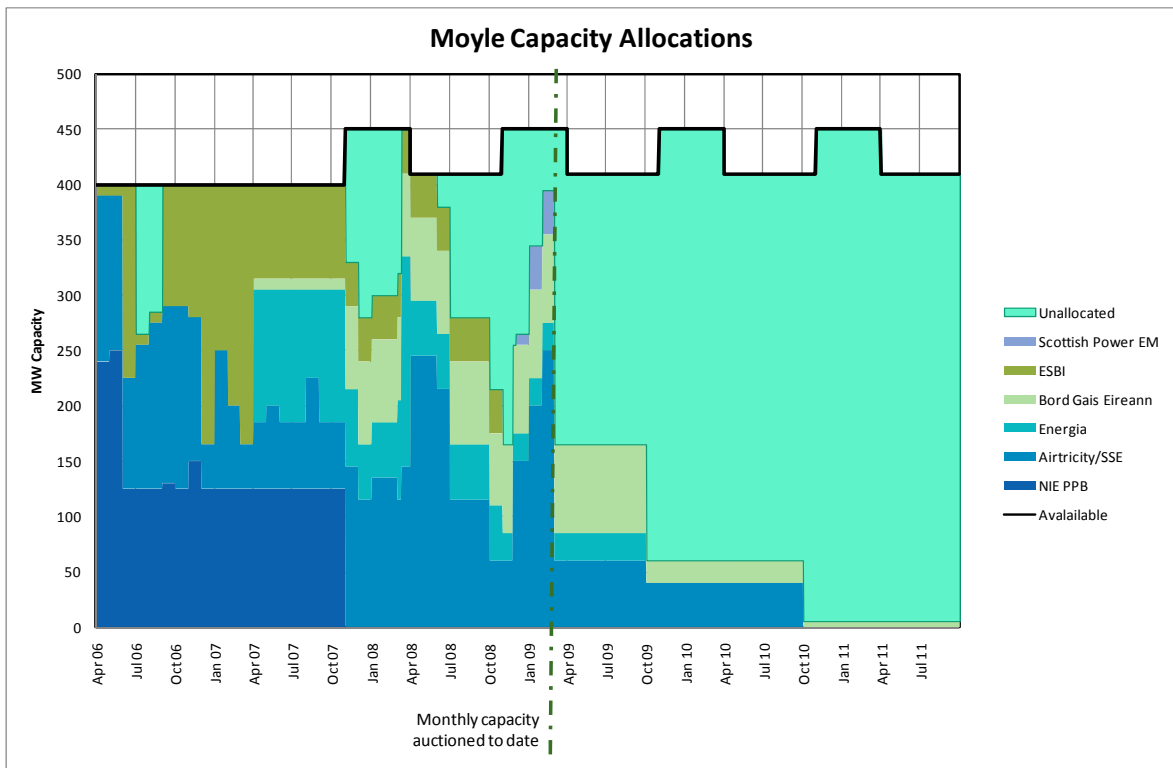
- The Reserve Price for standard Capacity Contracts is £2,078 per MW month (import and export)
- The price for a non standard import Capacity Contract is £3.00/MWh with a 500MWh per 5MW block minimum quantity; and
- The price for a non standard export Capacity Contract is £3.00/MWh with a 500MWh per 5MW block minimum quantity.¹¹

The average price obtained for each product in each auction is published on the SONI website.

Current Capacity Allocations

The capacity allocations are published on the Moyle Interconnector website. The graph below shows the current monthly and annual capacity allocations (prior to the auction for capacity for March 2009 on 26th February). This most recent auction was over-subscribed for the non-standard product.

¹¹ This is equivalent to about € 3.25/MWh at today's exchange rate.



2.2 Future Interconnectors

In addition to Moyle the following interconnectors are planned.

East – West Interconnector

The East-West Interconnector, due to be available for use in July 2012, is a Direct Current (DC) IC with a planned capacity of 500MW. As the owner of the East West IC, EirGrid will manage its construction with oversight from the CER. Connection offers have been accepted by EirGrid between Deeside in Wales and Woodland in County Meath. The CER have approved the project based on EirGrid’s ‘Approval to Proceed’ submission in February 2009. Final approval for proceeding was also given at cabinet by the Irish Government in March.

The East-West IC will be a regulated asset owned and operated by EirGrid. The estimated cost is some €600 million, meaning an annual revenue requirement of an estimated €50 million¹² which will be recouped through customer Transmission Use of System charges (and congestion charges should the IC be congested). The East West IC shall be subject to European Union Congestion Management Guidelines and therefore it must be subject to third party access and use it or lose it principles (described in more detail below). The details of the regulation of this IC and auctioning of capacity have yet to be determined.

¹² This will be dependent on the term structure of the finance, the regulatory regime and auction receipts

IMERA Interconnectors

In addition to the above IMERA, a private energy infrastructure company with offices in Dublin and Amsterdam, have applied to EirGrid and National Grid in GB for connection offers for one 350 MW IC and one 700MW IC. The first of these proposes a Direct Current IC connecting Arklow in Ireland with Pentir in Wales and the second connecting Great Island (Wexford) in Ireland with Pembroke in Wales. IMERA are currently in the process of application for non-firm connection offers for these sites with the longer term firm connection offers most likely falling under the Gate 3 connection process¹³. IMERA have stated that their two ICs are scheduled for commissioning in 2010.

On 10 February 2009 CER and Ofgem granted to IMERA ICs an exemption¹⁴ for two 350 MW ICs from the Third Party Access rules set out in Article 6(6) of Regulation 1228/2003 on Cross-Border Trade in Electricity and relevant articles of Directive 2003/54/EC. The exemption, for a period of 25 year for the first IC and 20 years for the second, was made subject to the following condition as amended by the European Commission:

- (a) a capacity cap of 40% applied to any dominant party in either generation or supply in either system or market to which the IC is connected. For the calculation of the capacity cap undertakings belonging to the same group shall be considered together.
- (b) prior to commencing commercial operation IMERA shall make reasonable endeavours to implement effective congestion management in accordance with the Congestion Management Guidelines in particular by enabling intraday¹⁵ trading by system users.
- (c) CER and Ofgem will assess the effectiveness of the secondary trading and use it or lose it (UIOLI) provisions in ensuring access for all potentially interested parties within six months of the first twelve months the IMERA IC is made available to system users.

The consequences of this are that IMERA must make best endeavours to provide for the implementation of effective congestion management, specifically intra-day trading by IC users in the SEM. In addition IMERA is required to provide for the implementation of effective UIOLI and secondary trading arrangements. As the SEM rules do not currently allow for either intra-day trading or UIOLI, IMERA have discussed with the RAs their intention to bring forth modifications to the TSC to put these in place. The RAs will progress these matters as part of a package of Modifications to the TSC to bring the SEM rules on interconnectors into line with EU regulations.

¹³ The current market rules do not contemplate the concept of a non-firm Interconnector.

¹⁴ The Regulation on cross-border trade in electricity, allows new interconnectors to be exempted from the standard system of charging, so that higher charges may be levied. EU Member States or Regulatory Authorities can grant those exemptions, if specific criteria are fulfilled. The European Commission has to be notified of such an exemption and, within two months, can request that the decision is amended or withdrawn.

¹⁵ Intra-Day Trading refers to the possibility for transactions between market participants to take place after gate closure of the day ahead market.

2.3 EU Regulation of Interconnectors

At EU level rules governing the cross border trade in electricity are set out in Regulation 1228/2003 (as amended). The purpose of these is to stimulate cross-border exchanges in electricity by establishing a compensation mechanism for transit flows of electricity and by introducing harmonised principles on cross-border transmission charges and the allocation of available interconnection capacities between national transmission systems. The Annex to the Regulation (the Congestion Management Guidelines) sets out the guidelines on the management and allocation of available transfer capacity between national systems. The regulation's main provisions are:

Compensation mechanism between operators of transmission systems

- Transmission system operators (SOs) will receive compensation for costs incurred as a result of hosting cross-border flows of electricity on their network. This compensation is paid by the operators of national transmission systems from which the cross-border flows originate. Compensation received by SOs for hosting cross-border flows is to be calculated based on the costs of the infrastructure "used" for the flows.
- Charges applied by network-operators for access to networks are transparent and take into account the need for network security and reflect actual costs incurred.

Information on interconnection capacities

- SOs are to install coordination and information exchange mechanisms to ensure security of the networks in the context of congestion management. Network congestion problems are addressed with non-discriminatory solutions, i.e. methods that do not involve a selection between contracts of individual market participants.

General principles of congestion management

- Market participants must inform the SOs whether they intend to use allocated capacity a reasonable time ahead of the relevant operational period. Any allocated capacity that will not be used is reattributed to the market in an open, transparent and non-discriminatory manner. In other words UIOLI must be implemented.
- The guidelines specify in particular:
 - details of methods for determining the quantity of cross-border flows hosted and the magnitudes of such flows;
 - details of the treatment in the context of the inter-SO compensation mechanism of electricity flows originating or ending in countries outside the European Economic Area;
 - harmonised, appropriate and efficient locational signals at European level.
 - provision of information and confidentiality.

New Interconnectors

New DC interconnectors may, under certain strict conditions, benefit from exemptions to the above. In this context, the European Commission monitors Member States' decisions on exemptions and the restrictive way these measures are to be interpreted. The recent exemption granted to IMERA's two proposed ICs is an example of this.

Third Package proposed changes

In addition to the above the EU third energy legislative package currently in the decision making pipeline includes provisions strengthening inter-system operator cooperation. Additionally there are proposals to formulate guidelines to assist applicants and regulators in applying the conditions for an exemption from third party access rules. It is proposed to make general the minimum requirements for the allocation of capacity and congestion management provisions for new infrastructure (such as Interconnectors) that have until now by applied on a case-by-case basis.

Implications for SEM

In bilateral meetings on Moyle IC usage in the SEM, market participants and other IC interested parties have stressed the importance of the developing EU level Electricity Regional Initiative¹⁶. The SEM comes under the aegis of the France–UK–Ireland (FUI) Regional Electricity Market (REM), which brings together regulators, electricity companies, Member States, the European Commission and other interested parties to develop and improve the way in which regional energy markets develop. The FUI REM has a common aim with the six other REMs¹⁷, to integrate fragmented national electricity markets into regional markets. Participants were of the view that there should be more active participation from the RAs, in particular in the context of increased interconnection between the SEM and BETTA.

¹⁶ The European Regulators' Group for Electricity and Gas (ERGEG) launched in Spring 2006 the Electricity Regional Initiative (ERI), made up of seven electricity Regional Energy Markets (REMs), as an interim step to creating a single electricity market in Europe.

¹⁷ The six other REMs are Baltic, Northern, Central-South, Central-East, South-West and Central-West.

3 Analysis of IC Use

In light of the issues highlighted above detailed analysis¹⁸ was undertaken of:

- flows across the Moyle IC in the period both immediately before the beginning of the SEM and between the start of the SEM and now;
- the behaviour of individual market participants both before and after the SEM began; and
- possible explanations of participants' use of the Moyle IC both before and after the SEM began.

3.1 Pre-SEM

The main points to note from analysis of trading on Moyle for the period leading up to the start of the SEM:

- the Moyle IC was used extensively both for imports from and for exports to GB, as shown in Chart 1 below;
- these flows do not seem to be closely related to the differences in prices between the GB and ROI markets, as shown in Chart 2;
- this may be because participants were:
 - using the Moyle IC mainly for balancing purposes;
 - unwilling, on grounds of transaction costs and price risk, to take any advantage of day-ahead arbitrage opportunities when they opened up; and
 - reluctant to rely on relatively high and uncertain top-up prices in ROI to supply a customer base in ROI preferring instead to import what was required to meet their load requirements in the Irish market on the basis of contracts of varying length with GB generators.

3.2 SEM

On the face of it there appears to have been a significant decline in the volume of flows at around the time the SEM started, as shown in Chart 3 below, which compares average daily imports and exports across the Moyle IC since the beginning of 2006. The black dashed line is drawn at 1st November 2007 when the SEM began.

It can be argued that the daily average volume of imports was no different in earlier periods (e.g., the summer of 2006) and that it was the high level of imports in August, September and early October 2007 that was in part unusual. Nonetheless, it is apparent that the Moyle IC has not been used to its full potential since November 2007, either for the import of energy from GB or for exports to GB; and that there were times when profitable price arbitrage opportunities were available but were not taken up by participants.

¹⁸ The detailed analysis, aspects of which are commercially sensitive, is not presented in this paper.

Chart 1: Average Daily Imports & Exports (in MW) Pre-SEM

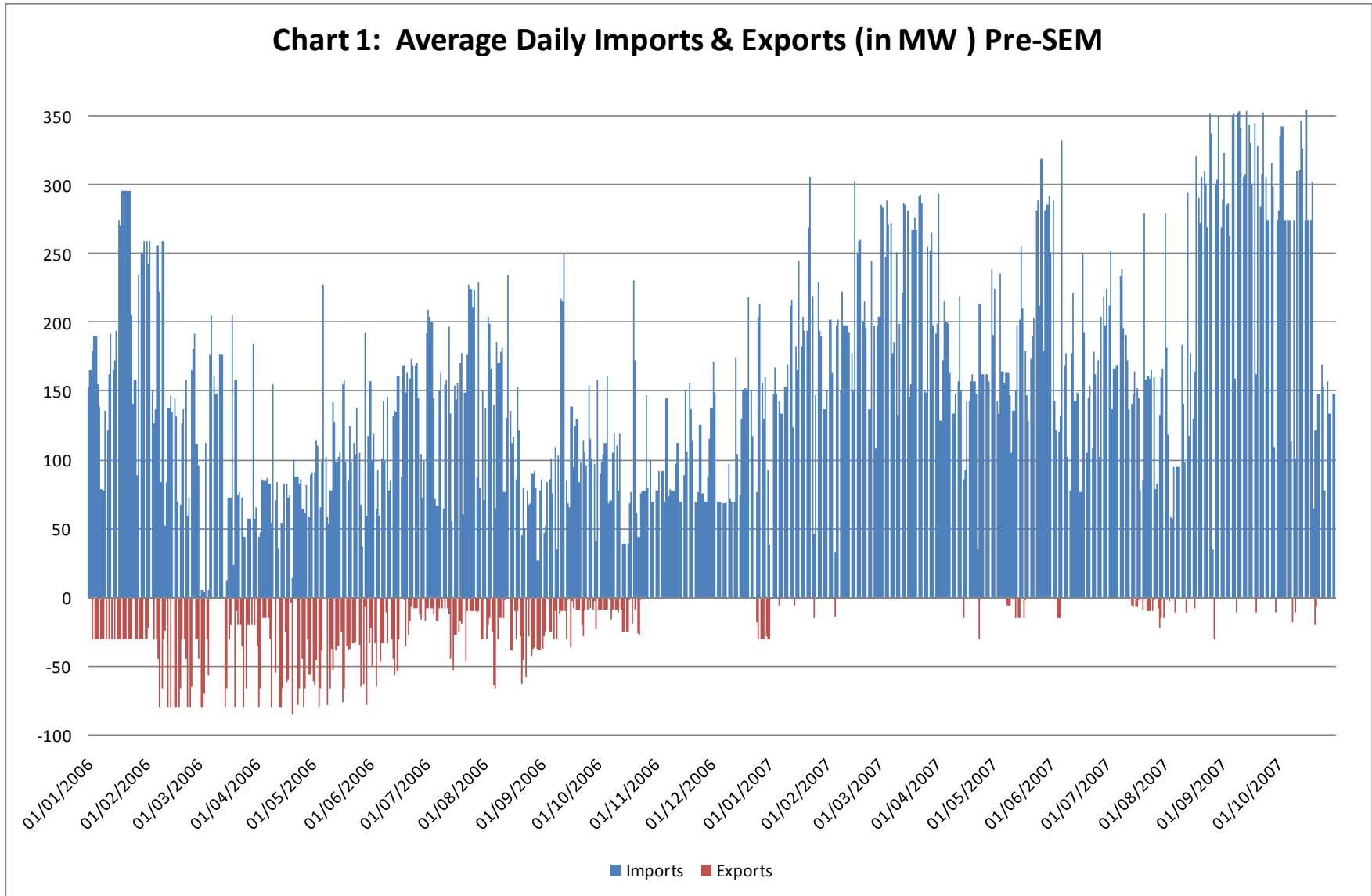


Chart 2: Pre-SEM Imports & Exports and Price Differentials

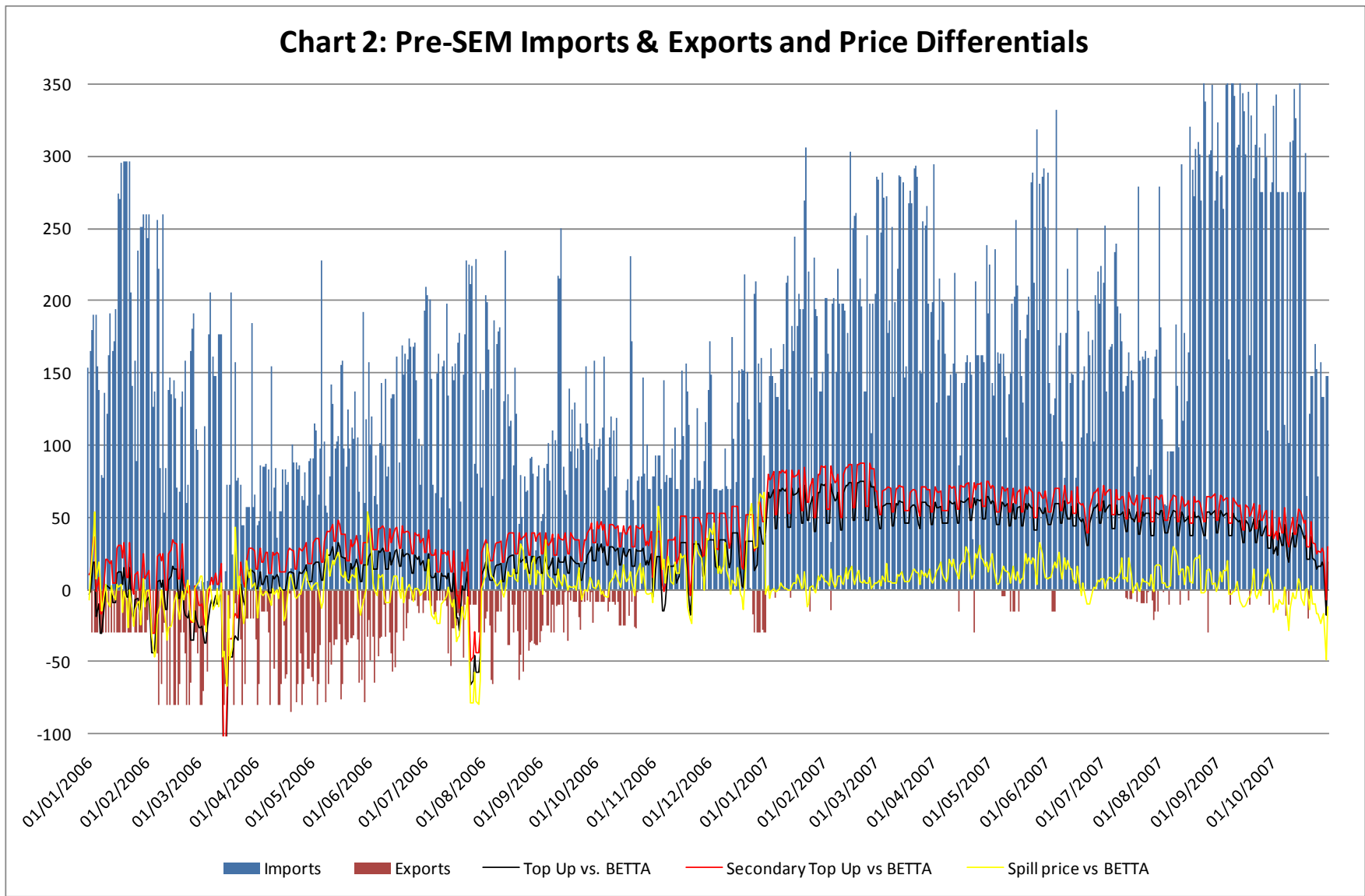
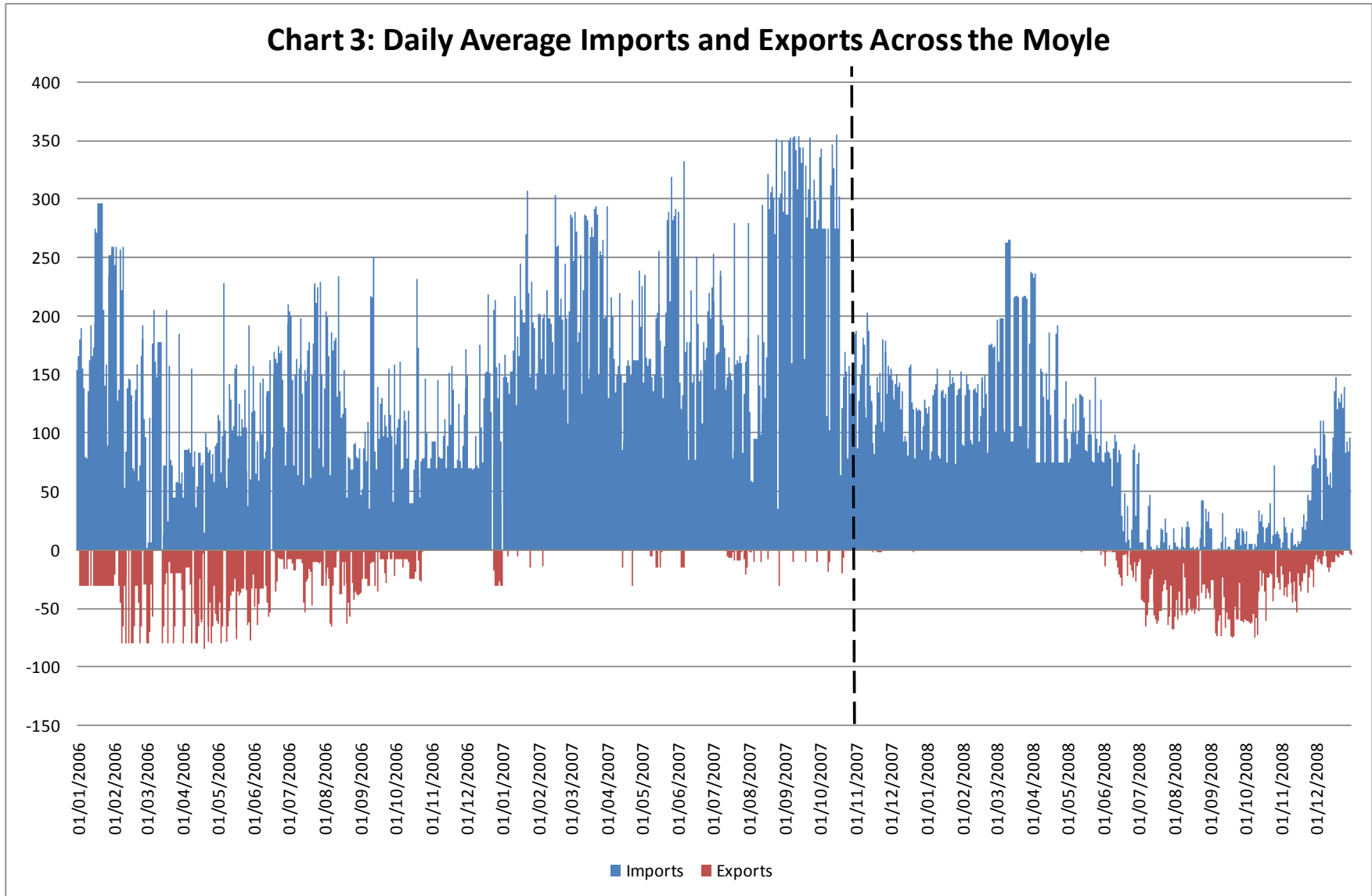


Chart 3: Daily Average Imports and Exports Across the Moyle



At first sight, Chart 4 below, which compares gross imports and exports with the price differential between the SEM and the day ahead price in the GB market, suggests that there is a relationship between the price differences between the two markets and flows across the interconnector¹⁹. This accounts for the switch from importing to exporting in mid-2008 and participants attributed this because of increased price convergence between the SEM and the GB market.

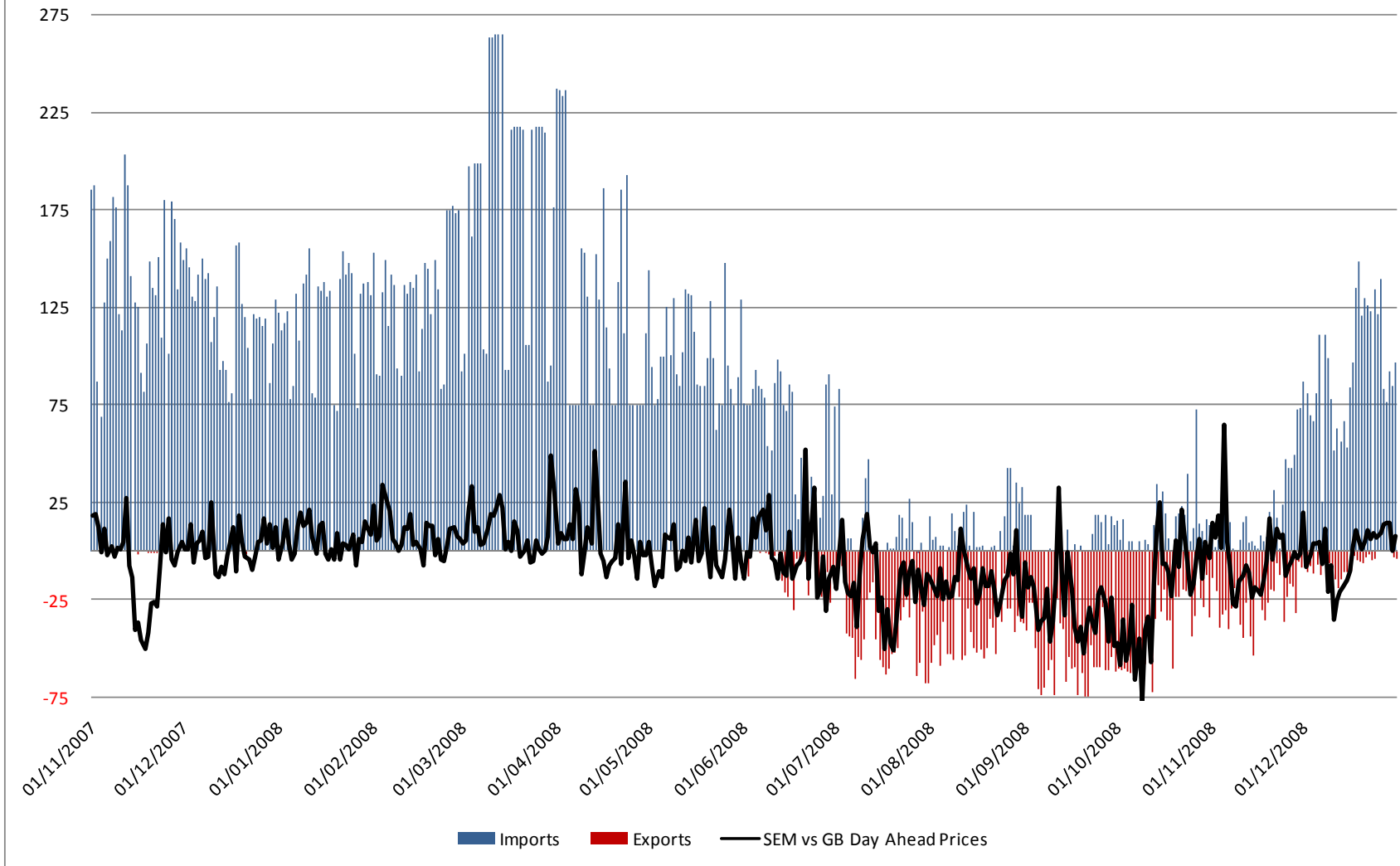
But statistical analysis shows that only 25% of the variation in daily average imports can be explained by the variation in the daily average price differential over the fourteen months; and that only 40% of the variation in exports can be explained by variations in the price differential. This suggests that, while the influence of price on flows across the Moyle IC is greater now than it was before the SEM began, factors other than price differentials explain the major part of gross flows in both directions across the Moyle IC.

This supports the views expressed in the various discussions with existing and prospective participants that there are barriers to using the Moyle to exploit price arbitrage opportunities. These barriers include:

- the costs of using the Moyle IC, which include paying for line losses on the IC itself and the cost of buying capacity;
- the risk of the Moyle IC being unavailable;
- *ex post* pricing of energy in the SEM, which creates uncertainty for participants exporting to GB;
- the price and quantity risk for those seeking to import into the SEM created by the interval between the 10am gate closure in the SEM and the notification two hours later of their physical position.
- the lack of liquidity in the day ahead market in GB, particularly at weekends and for anything but Electricity Forward Agreement (EFA) block contracts;
- the requirement on a Moyle IC user to bid half-hourly prices in the SEM when the only liquid day ahead products available in GB are four hourly EFA blocks with a minimum EFA block size of 50MW;
- the lack of a liquid day ahead market in the SEM, which would allow participants to refine their positions closer to real time;
- for those wishing to import into the SEM on weekday evenings between November and February, the risk that significant flows during the period will occur at a time of one or more of the three (i.e. triad) periods of peak system demand in the GB market, which then determines the annual Transmission Network Use of System (TNUoS) charge which the participant would have to pay;

¹⁹ The SEM price is defined as average daily *ex-post initial* SMP plus the average daily capacity payment paid to generators on that day.

Chart 4: Imports , Exports and SEM/BETTA Price Differentials



- uncertainty caused by the incidence of the Balancing Services Use of System (BSUoS) charge in BETTA which fluctuates by half hour and is determined by the costs of balancing the GB system in that half hour. This can be substantial;
- uncertainty about the size of the half hourly capacity payment payable on imports, part of which is dependent on ex post loss of load probability (LOLP);
- the lack of price arbitrage traders in the SEM; and
- the 80MW limit on exports, the size of which inhibits the interest of suppliers in the GB market in sourcing energy in the SEM for use in BETTA.

4 Key Issues Emerging

With the above in mind, during consultations with market participants the following issues emerged as being key to the use by them of Moyle IC and future interconnectors:

4.1 Interconnector Capacity and Auctions

Moyle capacity is currently auctioned on a yearly and a monthly basis with a reserve price of £2,078 per MW for standard products. Since the establishment of SEM, and notably until the most recent round of auctioning, these auctions have been undersubscribed.²⁰ As described above, unsold capacity is however available on the day (at the reserve price through bi-lateral trade with Moyle itself). However the availability of the product cannot be guaranteed.

Currently no day ahead or intra-day products are offered. However, Moyle is planning on holding weekly auctions and a request has been submitted to NIAUR for an IT system which would allow this to happen. Shorter term auctions are currently being implemented on other European ICs and in particular on the England-France interconnector (IFA). Moyle propose aligning the system with that of other European interconnectors and possibly the forthcoming East West interconnector. However it is unlikely to be before end-2009 that such shorter term auctions are introduced on Moyle.

Potential profitable trades based on day-ahead price differentials may be being frustrated by lack of short term capacity products on Moyle. The above proposal is therefore worth exploring to address this.

Participants have expressed a preference for a means by which capacity which has been purchased and is not being used to be sold either to system operators or other market participants. This desire for Use it or Lose It will be a requirement for both the East West IC and any merchant ICs that come on line.

In addition, in our discussions with participants they also expressed a desire for increased involvement by the Market Operator in interconnector capacity auctions for Moyle and other ICs coming on stream.

Within Day Options

The SOs have raised with the RAs their concerns that the current mechanism available to them to ensure generation security and to manage constraints by using the Moyle IC are limited and costly to customers. Should a facility whereby unused capacity could be more readily made available (to SOs) after gate closure, it would likely allay SO concerns on the IC's role in security of supply and constraint management.

²⁰ Note recent auction prices where the non-standard product was over subscribed.

As the SEM rules stand, the SOs cannot dispatch IC Units away from volumes²¹ determined by the market engine day ahead and are forced to counter-trade (i.e buy back) the required energy from National Grid in GB to reverse the export. This price has on occasions been in excess of £800/MWh as it takes place at times of high demand in GB. Options proposed by the SOs, including an estimation of the SEM system costs, to deal with this issue are:

- **Option 1** – Under this option, the allocation of MIUNs to IC Units remains unchanged (i.e. there is no impact on SMP) and System Operators are permitted to dispatch Interconnector Units up or down, using the Commercial Offer Data submitted by IC Users. System Operators would be able to use this facility up to 15:00 on the day prior to the Trading Day, with Participants being paid through constraint payments
- **Option 2** – This option is similar to Option 1, in that it allows the System Operators to dispatch Interconnector Units up or down (after [15:00] on the day prior to the Trading Day) but this time using prices bilaterally agreed when trades are performed. This extends the opportunity for System Operators to trade directly with Participants for unused capacity, with payment to Interconnector Units for such trades via a new arrangement (directly to Participants and not through the Central Market Systems). This would be included by the System Operator within the calculation of the parameters used (SIIP/SIEP/SIIQ/SIEQ) for the Interconnector Residual Capacity Unit (IRCU) and would be settled as part of the constraint payment calculations.
- **Option 3** – This option would allow the System Operators to participate in BETTA, but only to the extent required to facilitate trading with the trading operation of the corresponding System Operator in BETTA (i.e., National Grid). The costs of such trades would be incorporated into the settlement of the IRCU.
- **Option 4** – Under this option, the System Operators would act as Participants in BETTA and make trades directly or via a Power Exchange. The costs of such trades would be incorporated into the settlement of the IRCU.

The scope of the Options put forward by the SOs (i.e. Options 1 to 4) are limited in nature to situations where the security of supply on the island is threatened. None of them would involve the SOs acting to take advantage of unexploited price arbitrage opportunities for the benefit of consumers in Ireland. They are not mutually exclusive, though pursuing all four at the same time would be expensive and would delay the implementation of a solution.

Option 1 appears to offer a simple solution to the SOs' problem of maintaining the security of supply, but it will add to the risks faced by participants when they submit their COD. This is because they will now not know until 15.00 what their physical position on the IC will be on the trading day. This gives them three fewer hours in which to hedge that position in the GB day ahead market. If the existing two hour hiatus inhibits trade, a five hour one will create an even greater barrier to trade.

²¹ Under the TSC, Dispatch Quantities are fixed at the level of MIUNs as determined by the Interconnector Administrator at 12.00 on the day before the trading day.

Option 2 addresses this problem by allowing participants to negotiate post gate closure prices with the SO which will presumably reflect the prices at which they can then hedge their position in the GB market. Option 2 is potentially more expensive than Option 1 in system costs, but it has the potential of delivering greater benefits, particularly if the SOs remit were to be widened to include trading for reasons other than system security, i.e. to exploit price differences between the SEM and GB. An issue that will need addressing, however, is that of discrimination. Under Option 2 only IC Users would be permitted to trade post-gate closure. Other SEM generators would not be permitted to revise their prices to reflect e.g. within day movements in gas prices. Moreover while Option 2 would involve intra-day trading of a kind, it would be limited to trading with the SOs, not between participants. It would be unlikely therefore to meet the requirements of the IMERA exemption.

Options 3 and 4 would effectively provide the SOs with a greater ability to trade in BETTA, and are broadly in keeping with the original intention of the TSC provisions on post gate closure use of IC capacity by the SOs. While Option 3 requires the GB SO to act as a middle man for the SEM SOs, Option 4 goes a step further and permits the SOs to trade as full participants in BETTA. As neither of these options require changes to the central market systems or significant changes to the SOs systems, they would be relatively easy and not overly expensive to implement. Both options limit within day trading to the SO and so should be considered inadequate to meet the requirement of intra-day trading.

The RAs will therefore continue discussions with the System Operators on the above options with a view to increasing the opportunities for use of the IC capacity within day in the short to medium term in the interests of consumers and security of supply.

In addition to the above, other parties consulted have been considering further options for the within day use of ICs. In particular, thought has been given to allowing the SOs to dispatch an IC Unit away from its MIUN involving the IC Unit committing to a 'firm' price and providing two sets of bids. This may be progressed as part of future work on within day options.

In view of EU requirements to implement intra-day trading on ICs, the RAs are minded to pursue this as a medium term goal for the SEM. None of the options outlined above would allow full intra-trading, and all the SOs' options concern the SOs use of the IC rather than facilitating within day trading by all market participants. The SEM design does not, at present, allow for participants to alter their position post-gate closure at 10am on D-1. Further investigation is required to establish whether the existing system design could be used or changed so as to allow an intra-day market. This requires further consideration and potential alternatives will be developed for discussion presently.

Export restriction on Moyle Interconnector

Only 80MW of export is currently permitted on the Moyle IC as a result of security of supply concerns in Northern Ireland and transmission constraints in Scotland. Some participants felt strongly about increasing this capacity, particularly if GB participants who usually trade in 50 MW blocks are to be encouraged to use the Moyle IC, and in that respect it could be regarded as a deterrent to future market coupling. Policy makers should be aware that any drive to

increase this capacity will cost in terms of increased constraint costs and use of system charges levied on users of Moyle. However the proposals outlined above and/or the introduction of intra-day trading would largely mitigate high constraints costs for the System Operator should the 80 MW restriction be removed. It is recommended that this issue is investigated during the next stage of the process during discussions with National Grid in GB.

4.2 Misaligned Markets

Key differences between SEM and BETTA were acknowledged by all to be a barrier to increased trading on Moyle. Those highlighted include:

Lack of alignment of gate closures and ex-post pricing in SEM

- The BETTA market has a rolling one hour gate closure compared with 20 hour gate closure in SEM. This means that if exporting from SEM to BETTA, a position has to be taken by 10 am on the day prior to the trading day which is 20 to 44 hours ahead of real time. This is considered by many participants to create an unacceptable and significant degree of uncertainty.
- Moreover, exporting from SEM to BETTA is risky because of *ex post* pricing in SEM. By the time the trade is made in BETTA, the participant will not know the price it has had to pay in SEM until four days after the event. One participant thought this was a major deterrent to exporting over the IC.
- If importing from BETTA into SEM, the IC Unit will know its physical SEM position by 12.00 on D-1 and will then have time to trade this out in BETTA. However, the IU is still exposed to price movements during the two hours between 10am on D-1, when it submits its offer prices into the SEM, and 12 noon when it is told its physical position.

Other Market Misalignments

- The requirement on a Moyle IC user to bid half-hourly prices in the SEM when the only liquid day ahead products available in GB are four hourly EFA blocks with a minimum EFA block size of 50MW. One participant made the suggestion that the TSC rule on Commercial Offer Data could be amended to allow the bidding in of an entire EFA block for IC Units.
- The current setting of capacity payments for ICs based on flows was argued to be a barrier to trade by some participants. It was suggested that there should be remuneration for unused capacity on Moyle, allowing a reduction in capacity charges for Moyle users.

4.3 Trading Risks

Lack of liquidity

- The lack of liquidity in the day ahead market in GB, particularly at weekends and for anything but Electricity Forward Agreement (EFA) block contracts;
- The lack of a liquid day ahead market in the SEM, which would allow participants to refine their positions closer to real time;
- the lack of price arbitrage traders in the SEM;

Charging

- For those wishing to import into the SEM on weekday evenings between November and February the risk that significant flows during the period will occur at a time of one or more of the three (i.e., triad) periods of peak system demand in the GB market, which then determines the annual Transmission Network Use of System (TNUoS) charge which the participant would have to pay;
- uncertainty caused by the incidence of the Balancing Services Use of System (BSUoS) charge in BETTA, which fluctuates by half hour and is determined by the costs of balancing the GB system in that half hour, which can be substantial;

Other

- uncertainty about the size of the half hourly capacity payment payable on imports, part of which is dependent on *ex post* loss of load probability (LOLP);
- the 80MW limit on exports, the size of which inhibits the interest of suppliers in the GB market in sourcing energy in the SEM for use in BETTA;
- interconnector availability risk, given that there is only one interconnector currently operating in the SEM;
- participants with generation and supply in both markets are able to exploit their natural hedges to take advantage of profitable price arbitrage. Uni-jurisdictional participants are disadvantaged

5 Conclusions and Recommendations

As discussed above, the SEM is a relatively new market, having been established only in November 2007. The objectives of the SEM were to create an all-island market for trade in electricity which would ultimately benefit customers in Ireland and Northern Ireland through enhanced security of supply, increased competition between generators and the promotion of renewables. It was recognised at the time that the expected benefits to customers may not be seen for some time. However the SEM has served to date in attracting new entrants and as such security of supply on an all-island basis has been strengthened and competition between generators is increasing.²²

Decisions on whether to trade across the IC are influenced by number of factors, including the availability of capacity on the IC and its cost, the misalignment of the SEM and GB markets (gate closure and ex-post pricing) and trading risks such as the lack of liquidity in day ahead markets and network charging at triad periods in GB. Recently, for the first time since SEM establishment, auctions for capacity have been oversubscribed, which may imply that interest in trading on the IC is increasing, almost certainly as a result of a reversion to the more normal pattern of GB prices being below those in the SEM.

The main barriers to increased IC use by participants and the promotion of within day trading may need to be addressed in due course. Some, such as ex-post pricing and the timing of gate closure, are fundamental characteristics of the SEM design and are embedded in the market software. It is not proposed to consider addressing these in the short to medium term; rather to mitigate the identified market design shortcomings and other factors that are frustrating IC users from trading on the IC or SOs from using the IC as an efficient tool for managing constraints and exploiting price arbitrage opportunities.

It is noted that various proposals on TSC Modifications, system developments etc. have been made by the SOs and other parties to address the issues outlined above. It is proposed that the RAs engage with the industry to ensure effective coordination of these and to initiate further developments as required in line with policy objectives. The following next steps have been approved by the SEMC.

1. **Capacity Auctions** – Currently there are no day ahead or intra-day products offered on the Moyle IC, as has been discussed above. Moyle are considering holding weekly auctions and this mirrors shorter terms auctions which occur on other European ICs and potentially the forthcoming ROI ICs. It is recommended that the RAs support the development of short term capacity products and explore with the Market Operator and System Operators their respective current and future roles in IC capacity auctions.
2. **Within Day IC Options** – As set out above options have been proposed by the SOs and Moyle which would enable the System Operators to make use of IC capacity post gate closure through more flexible means than currently exist so as to increase security of

²² New entrants to the SEM include Endesa, Quinn Energy, SSE, Scottish Power and new renewable generation.

supply and reduce the cost of constraints. It is recommended that the RAs conduct a phased approach: assess and prioritise with the SOs options 1, 2, 3, and 4 above and implement as appropriate, then work on developing an approach to full Intra Day trading as required under EU rules.

3. **EU Regulation of ICs** – The EU requirements for the allocation of capacity and congestion management on Interconnectors and the specific exemptions from Third Party Access provisions granted to IMERA require the implementation of within day trading and Use It or Lose It provisions. It is recommended that the RAs discuss with participants, System Operators and current and future IC owners how best to develop these and consequential market rule changes.
4. **TSC Modifications** - It is recommended that the RAs establish a Working Group through the TSC Modifications Committee mechanism to assess and draft modifications to the TSC, as required to improve the treatment of interconnection.
5. **Capacity Payments Mechanism** - Consideration needs to be given to the question of and allocation of capacity payments for IC Users. This will be done through the Capacity Payments Medium Term Review.
6. **Moyle Export Capacity Restriction** – The RAs and the System Operators should investigate the costs/benefits and the appetite amongst participants for removing the 80 MW export restriction. This should be done within the context of cost, security of supply considerations in Northern Ireland, the development of rules for within-day trading and use of the IC by the SOs for constraint management and price arbitrage.

In **conclusion**, it is anticipated that the further work on market coupling will investigate key differences between the SEM and its regional markets. The possibilities for and costs and benefits of market coupling and timing factors will also be explored.

Annex A

As part of this analysis, the following were consulted:

- CER Networks team
- SEMO
- SONI
- EirGrid
- Airtricity/SSE
- Endesa
- ESBPG, ESBI
- ESBIE
- Viridian
- IMERA
- PPB
- IWEA
- Moyle Interconnector Holdings
- Bord Gáis
- ESBCS