



ElectroRoute

*Trading & Innovating
in Energy Markets*

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Section I: Marco Level Overview of Interconnector Trading in SEM

- ▶ A fully informed examination of SEM export trading must firstly review the macro level picture of SEM cross-border trading
- ▶ The debate so far has highlighted misunderstandings regarding interconnector trading which is hampering a more detailed level discussion
- ▶ This section aims to clarify the “big picture” situation with respect to cross-border trading
- ▶ Discussions on the four proposed MWPP modifications must consider whether these modifications improve or further impair the big picture situation

Interconnector Flows during 2013 and 2014

	“Idealised” ¹ Import/Exports Flows Based on SMP + CPGP vs GB	Actual Import/Export Flows ²
% Periods Import	54%	94%
% Periods Exports	34%	5%
% Periods in Deadband/No Flow	12%	1%

- ▶ It is indisputable, given the historic data, that around 34% of all periods should have been net/bulk export periods on the interconnectors
- ▶ The observable behaviour in the market is starkly different
- ▶ The stifled exports result in reduced running for SEM generation, increased wind curtailment and slightly depressed SEM prices versus that which should fundamentally prevail

[1] “Idealised”: the RAs chose this LRMC (Long Run Marginal Cost) approach as the basis for the illustrations in their presentation at the Modifications Committee, hence we use it here; SRMC is also feasible (and possibly preferable).

[2] (MIUNs Aggregated across all IC users on EWIC and MOYLE)

The problem with averaging

- ▶ Chart 1 shows the average import and export margins by time of day, with average export margins only positive at 6-7am. Some observers erroneously assume that exports should only occur in these periods.
- ▶ Chart 2 shows what percentage of the time imports and exports should ideally have occurred versus time of day.
- ▶ Actual interconnector trading occurs on a period-by-period basis and not on an averaged basis.
- ▶ In 2013-2014 imports should have occurred 54% of the time and exports 34% of the time.

Chart 1: Average Margin (LRMC) By Time of Day (2013-2014)

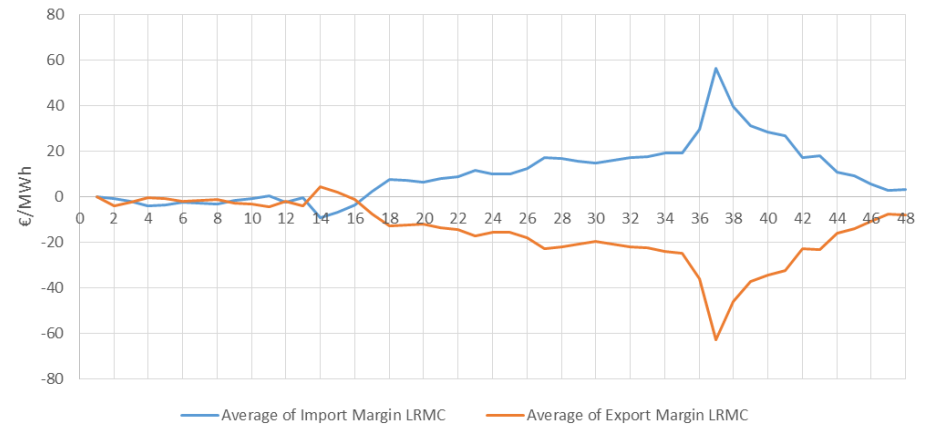
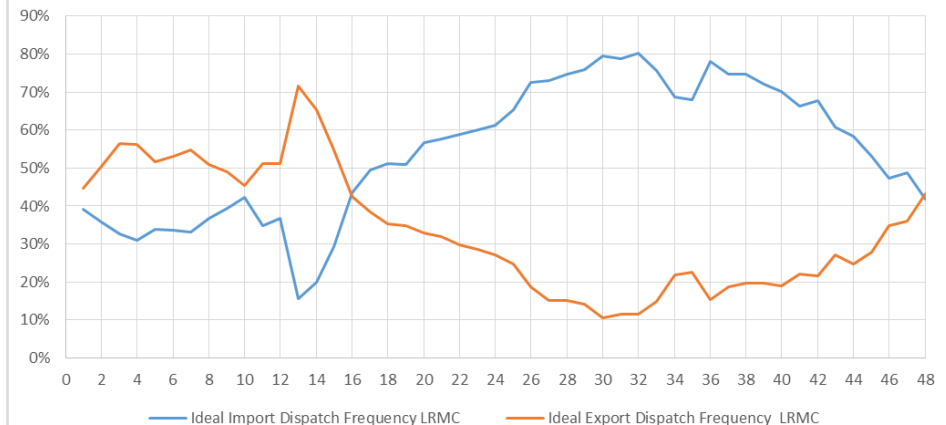


Chart 2: Ideal Dispatch (LRMC) Frequency (2013-2014)



Marco Level Issues – Stifled Exports

- ▶ Ideally exports should be occurring in 34% of all trading periods
- ▶ In reality only 5% of trading periods showed any export flows at all and then at limited volumes
- ▶ Import volumes during 2013 and 2014 are around 60 times that of export volumes
- ▶ Ideally this ratio should be closer to 2:1 (54% / 34%)

2013-2014	GWh
Actual Import Flows	7,842
Actual Export Flows	133

- ▶ **Why is the SEM stifling exports compared to what should optimally occur?**

Ex-Post Pricing and Volatile Uplift Movements

- ▶ The SEM Uplift Mechanism is unusual in the energy space, in that it conforms to the definition of a chaotic system (that is: although the precise mechanics of the system are known, tiny perturbations in inputs can create erratic changes in outputs).
- ▶ In the SEM the extreme and near arbitrary Uplift prices cause severe price spikes on many days in certain half hours. Such extreme prices would be unusual in other European markets holding an equivalent generation capacity margin as the SEM.
- ▶ The SEM also calculates its settlement prices at D+4 making firm knowledge of the prices impossible at the point in time interconnectors have to be scheduled on D-1

Mean Absolute Difference Between EA1 and EP2 SMP during 2013-2014	15.50 €/MWh
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- ▶ These factors combine to place a large asymmetric risk on interconnector traders. A trader cannot know with certainty where the uplift spike may occur. Given the commercial implications of missing the price spike with an import nomination, and indeed being hit by a price spike with an export nomination, traders will naturally over-schedule imports and under-schedule exports
- ▶ A simplified and exaggerated illustration of this dynamic is included on the next slide

Illustrative Example of Import Bias

Assume a simple* scenario where:

GB = 37 €/MWh all day

SEM = 35 €/MWh for 23 hours

SEM = 350 €/MWh for a unknown random hour in the day

The baseload price difference over the day is: $48.13 - 37 = 11.13$ €/MWh



Ideally the ICs should export for 23 hours and import for one hour
However, given the uncertainty around the occurrence of uplift the asymmetric risk means that traders just import for 24 hours. A huge volume distortion from idealised flows

** Note this is an exaggerated illustration but these dynamics underpin the current import bias*

MWVP a Counterbalance to Current Import Bias

- ▶ The market design flaws outlined above cause an import bias on the SEM interconnectors
- ▶ The MWVP mechanism provides an important counterbalance (albeit imperfect in design) to the existing design flaws in the SEM
- ▶ An asymmetric risk of unexpected price spikes can be mitigated by using MWVP to ensure that export traders are not charged prices far in excess of what they stated they were willing to pay. This allows traders to somewhat mitigate the pre-existing bias towards import
- ▶ A mechanism to counter the risk of over charging (and under-recovery of cost) is exactly what the SEM MWVP mechanism was intended to fulfil

Section 2 : Impact of Proposed Modifications with Respect to Marco Level Issues

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- ▶ It is clear that the existing SEM design already creates conditions which distort cross-border trading by increasing imports and stifling exports
- ▶ An estimated 2,000 GWh of export trade may have been hampered over the past two years representing over €100M in value
- ▶ This situation will have certainly increased the amount of wind power that had to be curtailed over the past two years although estimating this quantity is difficult
- ▶ The current discussions on the four proposed MWP modifications must clearly consider if the changes improve or further impair this situation.

Effectiveness of RA Modifications

- ▶ *Mod_09_14 Amendment to MWPs for IC Units and Mod_10_14 MWPs for IC Units*
 - Remove or reduce the effectiveness of MWPs in counterbalancing the existing import bias
 - Fail to address fundamental issue of distorted cross border trade
 - Fail to address fundamental principles around dispatch and market design
 - Discriminate against one type of participant and fails to acknowledge MWPs issues equally apply to any entity purchasing out of the pool
 - Are unlawful increased restrictions on cross-border trading
- ▶ We believe the RAs' mods are badly-judged and suggest a lack of understanding on the current cross border trade dynamics, fundamental market principles, and the legal frameworks governing such rules.

Effectiveness of ElectroRoute Modifications

- ▶ Mod_11_14 Pay-As-Bid / Paid-As-Bid for Interconnector Units
 - Suggests a fundamental revision of cross border price signals in order to remove the asymmetric bias towards imports
 - Will be a significant conceptual change to the market
- ▶ Mod_12_14 Amendment to Make Whole Mechanism to remove Settlement Periods of simultaneous import and export flows
 - Fixes some micro level issues of netting and disjointed price signals in near term
 - Will not fundamentally address the full extent of the import trade bias
- ▶ We believe that none of the current modifications will address the full extent of the cross-border design flaws. However, Mod_12_14 offers some near-term improvements over current practice and will clarify to all traders the means by which trade is expected to take place in the interim. Further consideration of the remaining issues should subsequently take place

Section 3: Responses to Specific Questions from Modifications Panel

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- ▶ Given the time available we have sought to best interpret and address the questions received
- ▶ However, many of the requests for estimates are not achievable within the available time (if at all)

I. IWEA Questions

Q: Impact on *Cross border trades (in particular exports)*

A: Initially important to acknowledge the existing import bias (95% Vs 54%) and export impairment (5% Vs 34%). Without full modelling with a SEM dispatch model it is difficult to determine precisely the impact of final flow volume in GWh, however we can infer with more confidence the impact of the frequency of flow direction from the respective mods

Interconnector Flows during 2013 and 2014	Idealised Import/Exports Flows Based on SMP + CPGP Vs GB (LRMC Basis)	Actual observed Import/Export Flows (MIUNs Aggregated across all IC users on EWIC and MOYLE)	Estimated Flows After : Mod_09_14 Amendment to MWPs for IC Units	Estimated Flows After : Mod_10_14 MWPs for IC Units	Estimated Flows After : Mod_11_14 Pay-As-Bid / Paid-As-Bid for Interconnector Units*	Estimated Flows After : Mod_12_14 Remove periods of simultaneous import and export flows**
% Periods Import	54%	94%	94%	94%	54%	65-94%
% Periods Exports	34%	5%	0-5%	0-5%	34%	5-34%

* Assumes redesign results in fair and balances IC flows

16 ** Near term improvement from clarity of expected trading approach between all traders

I. IWEA Questions

Q: *Impact on curtailment levels of wind generation*

A: It is fair to assume that if market-based exports decrease then the burden on the SO to alleviate curtailment will increase and vice versa

Interconnector Flows during 2013 and 2014	Estimated Flows After : Mod_09_14 Amendment to MWPs for IC Units	Estimated Flows After : Mod_10_14 MWPs for IC Units	Estimated Flows After : Mod_11_14 Pay-As-Bid / Paid-As-Bid for Interconnector Units	Estimated Flows After : Mod_12_14 Remove periods of simultaneous import and export flows
Impact on Wind Curtailment	Neutral or Increased Curtailment	Neutral or Increased Curtailment	Reduced Curtailment	Neutral or Reduced Curtailment

I. IWEA Questions

Q: *Impact on cost to consumer ?*

A: We believe that the consumer will be best served by making the market changes that will move interconnector trading to its natural fundamental state (described here as 54% import / 34% export). There are several components of this:

- ▶ More balanced IC trade will reduce the amount of wind curtailment, the liabilities of which may fall on the consumer to recover
- ▶ More market based exports will reduce the amount of SO controlled exports which have to be undertaken. These trades are mostly below market rates and as such pose a cost to the consumer
- ▶ The Irish consumer now is part of a wider European marketplace and it has been determined that the common market in Europe will work to the benefit of all consumers and as such correcting distortions in cross-border trade at a high level fulfils this goal
- ▶ There may be a positive impact of increased exports on dispatch balancing costs in the market (although no study has been undertaken yet)
- ▶ MWP payments while a zero-sum mechanism does place a cost recovery obligation on retail side of the market. This however is currently extremely small (e.g. €2-4M out of an imperfections pot of €180M) but ideally the market changes needed (expressed by a new Mod) may not necessarily have to rely on a MWP payment mechanism at all by fundamentally triggering and pricing cross border trade optimally in the market.

We believe that the RA's proposals do nothing to fulfil the above objective and will likely increase the costs to the final consumer through a number of channels

I. IWEA Questions

Q: *We would recommend discussion between the RAs and Electrорoute on this, or perhaps a working group.*

A: We agree with the above suggestion. We believe this is the best way forward. Once the fundamentals of the current situation and market principles are outlined we believe that it may not take long to jointly (or as part of a working group) derive a suitable modification that will address the current issues

2. ESB

ESB's submission was a commentary, rather than questions, but Mod Panel discussion and its submission compared the trading activity of different interconnector users. The comment below is paraphrased for the purposes of response and discussion.

Q: *“Other interconnectors traders export without a similar use of MWP”*

A: The ambiguity around the market design and its inherent flaws have resulted in a diverse set of approaches to cross-border trading from the different participants. Currently, participants take approaches ranging from (1) passive baseload (2) block import only, (3) import and export with no MWP, to (4) export with MWP. This diversity is atypical of cross border trading elsewhere in Europe where clear rules are understood by all and participants compete on cost and information, not on “approach”. We would like to see such clarity and convergence occur in the SEM market also, but clearly this has to be around a fundamentally sound design.

The comment may suggest that the use of MWPs is not appropriate or necessary. We believe that their use is wholly appropriate since the MWPs (like the other cost recovery mechanisms) were specifically introduced in the SEM for this purpose. The fact that they have not been triggered to the same magnitude previously in the life of the SEM is irrelevant from a design perspective and participants should not be guided by prior precedent but rather the fundamentals of sound market design and operation.

The fact that another participant engages in significant exports without using MWP as protection against an almost uncapped ex-post price risk is surprising. That an organisation would specifically seek out and incur this trading risk (which has a MAE of 15.50 €/MWh) when an alternative is available is unusual and almost unprecedented as far as risk management practices go in Europe. Having certainty over price (or at minimum a cap/floor) at the same time volumes are fixed/dispatch is a near universal feature of energy trading and indeed commerce of all types. We believe that now that details around the role of MWP are more commonly understood it would be rational to expect that participants would converge towards their use in managing the asymmetric risks associated with export trading.

Finally, we believe that simply looking at the approach on one or other participant in the markets is counterproductive in this debate. The debate should focus squarely on the fundamentals of the market, its current flaws, principles of design etc. And once these have been clarified and progressed all participants will share a common understanding and approach to cross border trading.

3. SSE Comments

Q: *Comparable data on EA2 export bidding behaviour for the periods referenced by the proposers*

A: Apologies but we are having trouble interpreting the comment. ElectroRoute is one of three companies that used that. Should we compare these three? (Rationally, accepted bids from participants exporting should be between Shadow Price and GB – CPGP)

Q: *Examples of non-profitable EA2 export trades (taking into account the MWP mechanism as it currently applies).*

A: Unclear of the purpose of question but example of loss making trade below from Sem Hour 5, Interval 1, 7th January 2015 (note transmission losses ignored for simplicity):

SEM Hour	SEM Interval	GB Forecasted Price £/MWh	Forecast CPGP £/MWh	EA2 Bid £/MWh	EA2 Shadow Price	EA2 MIUN MW	EP2 SMP €/MWh	Actual GB Price Achieved £/MWh	Loss
5	1	28.30	2.48	24.64	24.27 = Dispatched	-125	24.27 (< 24.64 means no MWP this time)	26.02	26.02-24.27-2.48 = -0.73 X 125/2 = - £45.62 loss

4.TSO Comments

- ▶ Q:The TSOs would not favour any increase to Dispatch Balancing Costs and would like clarity from the Modification proposer of what the potential impact to Dispatch Balancing costs would be if either of these two modifications were introduced.
- ▶ A:Without performing a detailed system level analysis including a model of constraints it is impossible to answer this question accurately. However, if it is assumed that the lack of export flows exacerbate Dispatch Balancing costs then the continuance of the existing import bias or a further impairment of export trading will maintain or increase these costs.This participant would be interested in the TSO's impression on the relationship between exports and dispatch balancing costs

Summary

Summary

- ▶ The market design flaws outlined here cause an import bias on the SEM interconnectors; SEM rules inherently favour imports over exports due to uplift volatility and uncertainty
- ▶ The MWVP mechanism provides an important counterbalance (albeit imperfect in design) to the existing design flaws in the SEM
- ▶ The stifled exports result in reduced running for SEM generation, increased wind curtailment, a reduction in social welfare and a likely increased cost to the final consumer
- ▶ The RA's modifications further exacerbate the import bias by seeking to remove or reduce the effectiveness of the MWVP mechanism
- ▶ We believe the mod panel should step back and look at the macro picture of cross border trade. Changes are required, but not in the fashion that the RA's Mod propose
- ▶ In the interim ElectroRoute's netting modification can provide some near term improvements to trade flows
- ▶ We strongly agree with the suggestion of one mod panel member that a new jointly proposed modification or working group would provide the best and swiftest solution to the set of issues. ElectroRoute would be happy to participate in any initiative