
FTR Trading Information Pack

November 2017

Moyle and East West Interconnectors

28th November 2017 – Version 2

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Revision History

| Version | Issue Date | Description |
|---------|--------------------------------|---|
| V1 | 27 th October 2017 | Original published document |
| V2 | 28 th November 2017 | p8: Update of the collateral options p9: Update of the FTR participation fees information p11 to 14: Update of the Moyle and EWIC 2018 Auction Calendar p22: Update of Appendix 3 on the training survey communication p24: Update of the LAMS formula in Appendix 4 p28: Addition of Appendix 5 to cover Loss-Adjusted Market Spread publication during the I-SEM Market Trial P29: Insertion of the latest JAO Registration Guide |

1. Introduction

The Moyle and East West Interconnectors link the electricity grids of the island of Ireland and Great Britain via submarine cables running between converter stations in Northern Ireland / Scotland and Ireland / Wales, respectively. Both of the High Voltage Direct Current (HVDC) connections are capable of providing capacity of 500 MW, flowing in both directions (import / export).

To date, physical capacity on the Interconnectors has been sold in long-term and daily auctions on an Auction Management Platform (AMP) specifically built to facilitate allocating capacity on Moyle and EWIC.

As part of new wholesale electricity market arrangements for Ireland and Northern Ireland, the Integrated Single Electricity Market (I-SEM) arrangements, the interconnectors will allocate long-term (or 'forward') transmission rights in the form of Financial Transmission Right Options (FTRs).

An FTR Option is a hedging instrument that entitles the holder to receive payments based on the hourly price difference between two interconnected and coupled¹ markets.

FTRs on Moyle and EWIC will be allocated in auctions facilitated by the Joint Allocation Office (JAO), a Luxembourg based entity established for the purpose of auctioning capacity on most interconnectors throughout Europe.

Ahead of the I-SEM arrangements going live, this Trading Pack seeks to provide interested parties with the necessary information to allow them to take the necessary steps to participate in auctions of FTRs on Moyle and EWIC. It provides an overview of how the new market arrangements will work on the Interconnectors, explains how to register with JAO to participate in auctions and provides links to relevant documents such as the applicable auction rules. The Trading Pack also provides provisional auction calendars, relevant parameters, frequently asked questions and a list of contact details for Moyle, EWIC and JAO.

¹ Coupling is the auctioning process where collected orders on power exchanges are matched and cross-zonal capacity is allocated simultaneously for different bidding zones for a specific market timeframe, typically day-ahead.

List of terms and abbreviations

| Term / Abbreviation | Explanation |
|---------------------|--|
| AMP | Auction Management Platform (existing auction participation platform to be retired) |
| Coupling | The auctioning process where collected orders on power exchanges are matched and cross-zonal capacity is allocated simultaneously for different bidding zones for a specific market timeframe, typically day-ahead |
| DAM | Day-Ahead Market |
| eCAT | JAO Auction Platform (new platform for participating in auctions on the interconnectors) |
| EWIC | East West Interconnector |
| FTR | Financial Transmission Rights (in this document, “FTR” will refer more specifically to the FTR Options) |
| GB | Great Britain (Northern Ireland forms a part of the Irish market, SEM) |
| HAR | Harmonised Allocation Rules |
| HVDC | High-Voltage Direct Current |
| Interconnectors | In this document refers to both Moyle and EWIC interconnectors, unless otherwise stated |
| I-SEM | Integrated-Single Electricity Market (on-going project) |
| JAO | Joint Allocation Office |
| Moyle | Moyle Interconnector |
| Participants | Entities participating in the auctions (existing and prospective market participants) |
| SEM | Single Electricity Market (existing market on the island of Ireland) |
| SEMO | Single Electricity Market Operator |
| TLAF | Transmission Loss Adjustment Factor |
| TSO | Transmission System Operator |

2. I-SEM and The Forwards Electricity Market

Moyle and EWIC currently sell a form of physical transmission rights available between the SEM and GB markets. These rights enable a participant to buy interconnector capacity in a long-term/forwards auction and/or at the day-ahead stage to nominate a flow of electricity across the interconnector within the participant's capacity holding, via the Single Electricity Market Operator (SEMO) for the island of Ireland. The participant will buy energy equivalent to the flow in one market and sell it in the other in order to earn the market spread i.e. the price difference between the two markets.

Under the I-SEM arrangements, the forwards electricity market will be strictly financial and the interconnectors will sell FTR Options (referred to elsewhere as simply "FTRs" in this document). FTR Options are a form of one-way contract for difference, entitling the holder to receive the positive day-ahead market spread in the direction of the FTR option. This section sets out what the new environment will look like for the I-SEM arrangements.

2.1 New market arrangements

Market coupling

A key aspect of the I-SEM arrangements is the introduction of day-ahead market (DAM) coupling. What this entails is a process whereby interconnector flows are determined by the day-ahead electricity prices in the connected markets. This implicit allocation of capacity is viewed as more efficient than the current explicit allocation where capacity holders nominate an interconnector flow which can often be counter intuitive i.e. against the positive market spread so apparently inefficient.

In a coupled market, energy transactions involving sellers and buyers from different bidding zones are centrally collected and cleared to maximise the efficient matching of trades. Trades from one bidding zone to another (such as from GB to the SEM) are only restricted by cross-border capacity, subject to allocation constraints.

Market coupling involves system and market operators working together to simultaneously allocate cross-border capacity and optimise cross-border flows, without the need for explicit auctions. In theory, as long as energy can flow freely, there will be a single price across all coupled markets. When the network is congested between bidding zones, prices diverge between those zones.

With market coupling, the available interconnector capacity is made available to the market and, where congestion exists between bidding zones, the interconnector is scheduled to flow from the low-priced market to the high-priced market². The result will be that 'congestion rent' is generated:

² Subject to ramping constraints which mean that an interconnector may not immediately be able to reverse its flow direction in response to the positive market spread direction changing from one period to the next.

Congestion rent =

MW delivered into high price market * DAM price in high price market

minus

MW flow out of low price market * DAM price in low price market

Due to electrical losses across the Interconnectors, the MW delivered to the importing market will be lower than the MW taken from the exporting market. These congestion rents are collected by the interconnector owner and these underpin the sale of FTRs in forward or long-term timeframes.

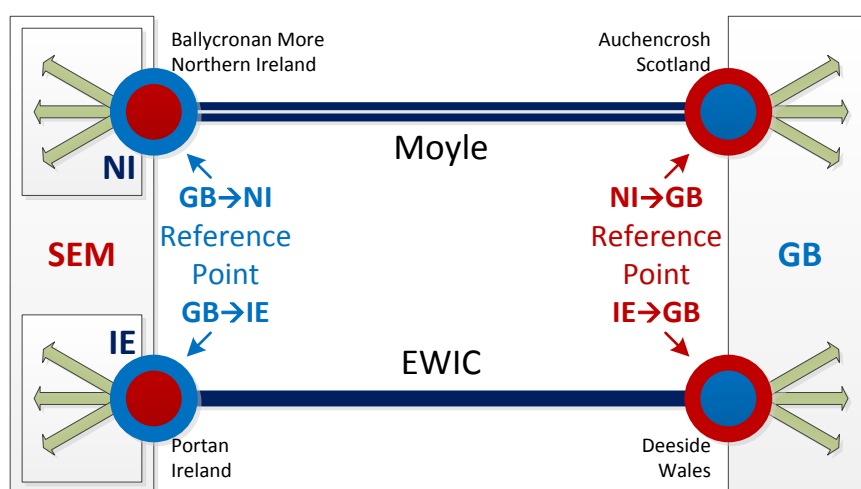
Financial Transmission Rights

As described above, FTRs entitle the holder to receive payments based on the hourly DAM price difference between two coupled markets during a specified period of time in a specific direction³.

FTRs on the SEM-GB border will be auctioned on a 'per-interconnector' rather than a 'per-border' basis, i.e. there will be separate auctions for Moyle FTRs and EWIC FTRs. They will also be sold by direction, i.e. there will be SEM-GB FTRs and GB-SEM FTRs - the former entitling the holder to a payment when the GB DAM price is higher and vice versa for the latter.

The payment that an FTR holder is entitled to is the positive loss-adjusted day-ahead market spread. A payment to an FTR holder is due when the market spread is positive in the direction of the FTR, i.e. for a SEM-GB FTR, when the SEM DAM price is higher, no payment will be due.

Payouts will also be adjusted to reflect the impact of electrical losses.



³ Note that during the I-SEM Market Trial, the Loss-Adjusted Market Spreads will be calculated and published. Refer to details in Appendix 5.

| ← Flow to SEM (NI/IE) ← | → Flow to GB → |
|--|--|
| The loss-adjusted market spread (€ per MW), with reference to receiving side is calculated as follows | |
| ${}_{GB \rightarrow IE}^{GB \rightarrow NI} LAMS = MAX \left[\left(SEMp - \frac{GBp}{\{1 - ICLF\}} \right), 0 \right]$ | ${}_{IE \rightarrow GB}^{NI \rightarrow GB} LAMS = MAX \left[\left(GBp - \frac{SEMp}{\{1 - ICLF\}} \right), 0 \right]$ |

- *LAMS* = Loss-adjusted market spread (*€/per MW*)
- *SEMp* = SEM day-ahead market price, in Euro
- *GBp* = GB day-ahead market price, in Euro
- ICLF is the loss factor for the relevant interconnector, 4.68% for EWIC and 2.36% for Moyle⁴

For reference, the Quantity at either side can be calculated as follows:

$$InQty = OutQty * (1 - ICLF) \quad OutQty = InQty / (1 - ICLF)$$

- *InQty* = Inbound / Receiving / Import side quantity (*MW*)
- *OutQty* = Outbound / Sending / Export side quantity (*MW*)

The applicable Interconnector Loss Factor will be different for Moyle and EWIC and will be a simple percentage figure. More information is contained in Appendix 4.

Joint Allocation Office

JAO is a joint service company of 20 European Transmission System Operators (TSOs), performing auctions of transmission rights on 28 borders in Europe. Moyle and EWIC are putting arrangements in place such that JAO will run auctions of FTRs on their behalf.

JAO will be the single point of contact for the FTR market—that is, they handle registration, systems, auctions, and manage all settlement. Parties wishing to participate in auctions of Moyle and EWIC FTRs will contract directly with JAO.

JAO will operate billing and settlement arrangements with respect to FTR auctions, including:

- JAO holds collateral from participants in respect of participation in FTR auctions
- JAO collects the proceeds of FTRs cleared at auction from participants.
- JAO settles the FTR option pay-out with FTR holders.
- All amounts and payments with JAO are in Euros for both Moyle and EWIC

⁴ [2017/2018 Approved TLAFs](#)

Collateral put in place with JAO can be in the form of cash (held in a dedicated business account, also referred to as a 'dedicated business account'), or bank guarantee (optional). The collateral is considered for all trading with JAO, which may be on multiple European borders. During the bidding period, Participants get warning if their collateral with the bids is exceeded. This gives the Participants the opportunity to update their collateral or bids before the auction closes.

Auction rules

FTR auctions will be conducted in line with Harmonised Allocation Rules for long-term transmission rights ("HAR")⁵ and the SEM-GB border specific annex ("Regional Annex")⁶. Please note that while this document provides an overview of some of the content of these documents, in the case of any inconsistency, the HAR and Regional Annex shall prevail.

3 Registering on JAO

In order to participate in FTR Options auctions organised by JAO, you will need to complete certain registration steps.

The first stage is to get your company registered with JAO. Subsequently, users for IT systems can be set-up along with the authorisations for financial payments.

There are several documents that are required to be signed and submitted to JAO.

The full suite of documents can be found on the JAO Resource Centre here: <http://www.jao.eu/support/resourcecenter/overview>.

The JAO Registration Guide is included as Appendix 6 of this Trading Pack and provides a step-by-step guide.

Please send all documents to the following address, no later than 7 working days before the close of the first auction in which you intend to participate:

**Joint Allocation Office
2 Rue Bitbourg
L-1273 Luxembourg-Hamm**

An electronic certificate is required to access and use the JAO platform, e-CAT (please see FAQs on electronic certificates).

⁵http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/ANNEXES_HAR_DECISION/Annex%20I_171002.pdf

⁶<http://www.eirgridgroup.com/site-files/library/EirGrid/Annex-7-to-the-Harmonised-Allocation-Rules.PDF>

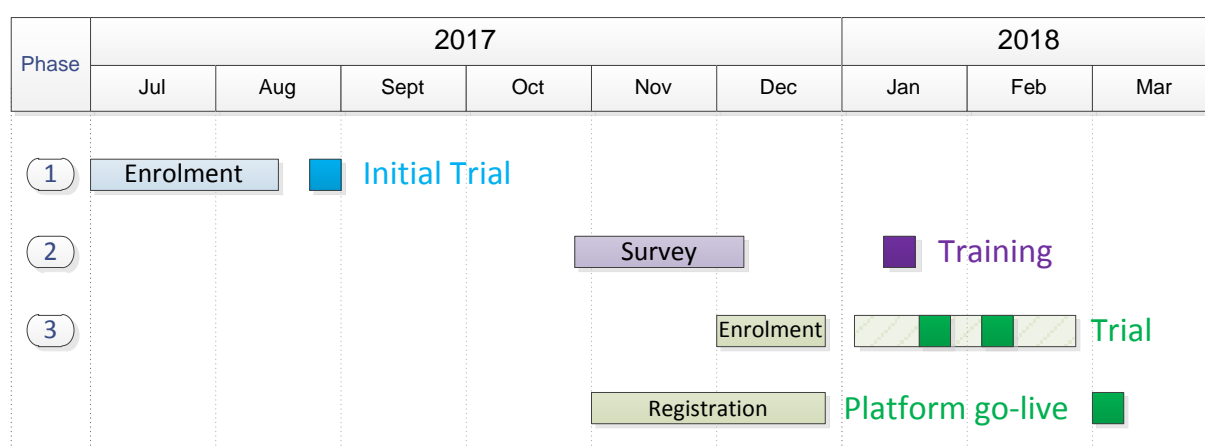
There are no fees associated with participating in FTR auctions on JAO, however there is a monthly fee (€10.42) on the business account. Participants only pay charges once they start using the Business Account (after the first movement on the account).

For any queries on registration, please refer to the JAO Registration Guide (Appendix 6), FAQ details in this document (Appendix 2), or use the JAO contact details listed in Section 6 of this Trading Pack.

For reference note that all market participants (including FTR holders) can sign up (self-service) for market notifications in I-SEM in the same way they currently do for SEM⁷. This should allow them to receive notification in relation to market performance including day-ahead fall back notification.

3.1 FTR Market Trial and Training

In advance of the first auctions, there are a number of trial, test, and training activities planned as illustrated below.



The first phase was the initial trial which facilitated an early sight of the IT systems so that participants could assess and validate their requirements to interact with the JAO platform.

The second phase is for participant training on the allocation platform. Training dates have been scheduled on 17th and 18th January and are shown above for illustration.

The third phase is the formal FTR market trial. It's expected that participants will have registered in advance of participating in this trial. This trial will be similar to the initial trial but covering the full scope of products available.

The key phase 3 dates are:

- 02/01/2018 – 19/02/2018: Web services tests/connectivity
- By 17/01/2018: User connectivity to JAO's trial environment
- 22/01/2018 – 26/01/2018: Intensive week of interactive scenarios

⁷ <http://www.sem-o.com/Publications/General/Participant%20Readiness%20Information%20publication.pdf>

- 05/02/2018 – 09/02/2018: Placeholder in case of scenario re-run
- During 02/2018: Settlement scenarios

The 'Financial Transmission Rights Auction: Trial and Participant Test Plan' and 'Financial Transmission Rights Auction: Initial Trial Report' are available from:

<http://jao.eu/support/resourcecenter/overview?parameters=%7B%22IsMoyleEwicInterconnectorsProject%22%3A%22True%22%7D>

4 Provisional Auction Calendars - 2018

The go-live for Moyle and EWIC on the JAO platform is planned for March 2018. From this point Moyle and EWIC will be shown on the JAO platform, the auction calendar will begin to be populated in the system, and participants can enter default bids.

The provisional auction calendar dates with indicative volumes for both interconnectors are outlined below.

The bidding windows for auctions will typically be as follows:

- Yearly: 5 working days
- Seasonal/half-yearly: 4 working days
- Quarterly: 3 working days
- Monthly: 2 working days

These working days are based on the Luxembourg calendar and holidays.

For the first auctions, which are for June 2018 products, the bidding windows will be open for 5 working days. This is based on participant requests to allow additional time for credit adjustments for the initial auctions.

1. Moyle Provisional Auction Calendar (2018)

All Moyle auctions listed below are planned to start and end at 13:30 CET/CEST, with the exception of the monthly auction for September (Monthly 2), which will start and end at 14:00 CET/CEST.

| Month | Start Date | End Date | GB to NI (Import) | | NI to GB (Export) | |
|--------|------------------------|-------------------------|------------------------|--------|------------------------|--------|
| | | | Product | Volume | Product | Volume |
| March | 22 nd March | 29 th March | Monthly 1 [June] | 80 | Monthly 1 [June] | 20 |
| April | 17 th April | 19 th April | Monthly 2 [June] | 100 | Monthly 2 [June] | 20 |
| May | 2 nd May | 4 th May | Monthly 3 [June] | 120 | Monthly 3 [June] | 20 |
| | 25 th May | 29 th May | Monthly 4 [June] | 100 | Monthly 4 [June] | 20 |
| June | 1 st June | 5 th June | Monthly 1 [July] | 80 | Monthly 1 [July] | 20 |
| | 1 st June | 6 th June | Quarterly [July-Sep] | 100 | Quarterly [July-Sep] | 20 |
| | 12 th June | 14 th June | Monthly 2 [July] | 120 | Monthly 2 [July] | 20 |
| | 15 th June | 19 th June | Monthly 3 [July] | 100 | Monthly 3 [July] | 20 |
| July | 3 rd July | 5 th July | Monthly 1 [Aug] | 80 | Monthly 1 [Aug] | 20 |
| | 6 th July | 10 th July | Monthly 2 [Aug] | 120 | Monthly 2 [Aug] | 20 |
| | 4 th July | 11 th July | SEM Annual 1 [Oct-Sep] | 70 | SEM Annual 1 [Oct-Sep] | 0 |
| | 24 th July | 26 th July | Monthly 3 [Aug] | 100 | Monthly 3 [Aug] | 20 |
| August | 3 rd August | 7 th August | Monthly 1 [Sep] | 80 | Monthly 1 [Sep] | 20 |
| | 1 st August | 8 th August | SEM Annual 2 [Oct-Sep] | 70 | SEM Annual 2 [Oct-Sep] | 0 |
| | 6 th August | 10 th August | Seasonal [Oct-Mar] | 50 | Seasonal [Oct-Mar] | 20 |

| Month | Start Date | End Date | GB to NI (Import) | | NI to GB (Export) | |
|-----------|------------------------------------|------------------------------------|------------------------|--------|------------------------|--------|
| | | | Product | Volume | Product | Volume |
| | 14 th August (14:00) | 16 th August (14:00) | Monthly 2 [Sep] | 120 | Monthly 2 [Sep] | 20 |
| | 17 th August | 21 st August | Monthly 3 [Sep] | 100 | Monthly 3 [Sep] | 20 |
| | 17 th August | 22 nd August | Quarterly [Oct-Dec] | 60 | Quarterly 1 [Oct-Dec] | 20 |
| | 22 nd August | 29 th August | SEM Annual 3 [Oct-Sep] | 70 | SEM Annual 3 [Oct-Sep] | 20 |
| September | 4 th September | 6 th September | Monthly 1 [Oct] | 80 | Monthly [Oct] | 20 |

2. EWIC Provisional Auction Calendar (2018)

All EWIC auctions listed below are planned to start and end at 13:30 CET/CEST.

| Month | Start Date | End Date | GB to IE (Import) | | IE to GB (Export) | |
|--------|------------------------|------------------------|------------------------|--------|------------------------|--------|
| | | | Product | Volume | Product | Volume |
| April | 27 th April | 3 rd April | Monthly 1 [June] | 100 | Monthly 1 [June] | 130 |
| | 9 th April | 11 th April | Monthly 2 [June] | 150 | Monthly 2 [June] | 130 |
| | 20 th April | 25 th April | Quarterly 1 [July-Sep] | 100 | Quarterly 1 [July-Sep] | 100 |
| May | 7 th May | 9 th May | Monthly 3 [June] | 150 | Monthly 3 [June] | 120 |
| | 17 th May | 22 nd May | Quarterly 2 [July-Sep] | 100 | Quarterly 2 [July-Sep] | 100 |
| | 23 rd May | 25 th May | Monthly 4 [June] | 100 | Monthly 4 [June] | 120 |
| June | 5 th June | 7 th June | Monthly 1 [July] | 100 | Monthly 1 [July] | 100 |
| | 11 th June | 13 th June | Monthly 2 [July] | 100 | Monthly 2 [July] | 100 |
| | 18 th June | 20 th June | Monthly 3 [July] | 100 | Monthly 3 [July] | 100 |
| July | 2 nd July | 4 th July | Monthly 1 [Aug] | 100 | Monthly 1 [Aug] | 100 |
| | 9 th July | 11 th July | Monthly 2 [Aug] | 100 | Monthly 2 [Aug] | 100 |
| | 11 th July | 18 th July | SEM Annual [Oct-Sep] | 50 | SEM Annual [Oct-Sep] | 50 |
| | 20 th July | 24 th July | Monthly 3 [Aug] | 100 | Monthly 3 [Aug] | 100 |
| | 25 th July | 31 st July | Seasonal [Oct-Mar] | 50 | Seasonal [Oct-Mar] | 50 |
| August | 31 st July | 3 rd August | Quarterly 1 [Oct-Dec] | 100 | Quarterly 1 [Oct-Dec] | 100 |
| | 7 th August | 9 th August | Monthly 1 [Sep] | 100 | Monthly 1 [Sep] | 100 |

| Month | Start Date | End Date | GB to IE (Import) | | IE to GB (Export) | |
|-----------|----------------------------|----------------------------|-----------------------|--------|-----------------------|--------|
| | | | Product | Volume | Product | Volume |
| | 10 th August | 14 th August | Monthly 2 [Sep] | 100 | Monthly 2 [Sep] | 100 |
| | 17 th August | 22 nd August | Quarterly 2 [Oct-Dec] | 100 | Quarterly 2 [Oct-Dec] | 100 |
| | 22 nd August | 24 th August | Monthly 3 [Sep] | 100 | Monthly 3 [Sep] | 100 |
| September | 3 rd September | 5 th September | Monthly 1 [Oct] | 100 | Monthly 1 [Oct] | 100 |
| | 17 th September | 19 th September | Monthly 2 [Oct] | 100 | Monthly 2 [Oct] | 100 |

5. Interconnector Loss Factors

The current SEM method for attribution of a Transmission Loss Adjustment Factor (TLAF) provides separate TLAF figures for day and night for each month for the annual period from October to September by which the energy provided by units on the Moyle and EWIC interconnectors is adjusted for transmission system losses for settlement purposes.

For the I-SEM arrangements an annual single loss factor is to be determined for each interconnector. This same loss factor per interconnector will be used for all of the SEM-GB coupled day-ahead and intraday markets, imbalance settlement in the SEM market, and adjustment of market spread for FTR remuneration.

With this approach there should be consistency between the loss factors used in the various market timeframes and the process of valuing and settling FTRs will be simplified.

The loss factors applicable for Moyle and EWIC will be⁸:

| | Applicable interconnector loss factor |
|-------|---------------------------------------|
| Moyle | 2.36% |
| EWIC | 4.68% |

⁸ Further information available at <http://www.eirgridgroup.com/site-files/library/EirGrid/I-SEM-Interconnector-Losses-Information-Paper-v1.0.pdf> and <http://www.eirgridgroup.com/site-files/library/EirGrid/2017-18-Approved-TLAFs-PDF-Version.pdf>

6. Contact information

Moyle Interconnector

First Floor The Arena Building
85 Ormeau Road
Belfast
BT7 1SH

Tel: +44(0)28 9043 7580
Fax: +44(0)28 9024 9673
Email: moyle@mutual-energy.com



East West Interconnector

Block 2 The Oval
160 Shelbourne Road
Ballsbridge
Dublin
D04 FW28

Tel: +353 (0)1 677 1700
Fax: +353 (0)1 661 5375
Email: eastwestinterconnector@eirgrid.com



Joint Allocation Office

2 Rue Bitbourg
L-1273 Luxembourg-Hamm

Tel : +352 (0)27 62 38 38
Fax : +352(0)27 62 38 99
Service desk : <http://helpdesk.jao.eu>
Email : helpdesk@jao.eu



Appendix 1 – Relevant documents / links

EWIC

<http://www.eirgridgroup.com/customer-and-industry/interconnection/>

Moyle

<http://www.mutual-energy.com/>

JAO

<http://www.jao.eu/main>

<http://www.jao.eu/support/resourcecenter/overview>

<http://www.jao.eu/support/resourcecenter/overview?parameters=%7B%22IsMoyleEwicInterconnectorsProject%22%3A%22True%22%7D>

SEMO / I-SEM

<http://www.sem-o.com/Pages/default.aspx>

<http://www.sem-o.com/isem/Pages/Home.aspx>

HAR

https://electricity.network-codes.eu/network_codes/fca/har/

http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/ANNEXES_HAR_DECISION/Annex%20I_171002.pdf

<http://www.eirgridgroup.com/site-files/library/EirGrid/Annex-7-to-the-Harmonised-Allocation-Rules.PDF>

Appendix 2 – FAQ

1. Where should the loss adjustment factor be applied?

The SEM-GB HAR Annex which notes the formula for the loss-adjusted market spread and confirms the receiving side as the reference point (art. 2.7).

For example, if there is a maximum flow from IE to GB on EWIC, the sending side MW is about 530 and the receiving side is 500. Some interconnectors also consider a mid-channel approximation (515). The loss-adjusted price spread needs to be calculated consistent with the reference point used and the receiving side will apply for Moyle and EWIC.

2. When is settlement for FTRs completed?

Settlement is on a Monthly basis:

- Once a month invoices or self-billings are issued to participants
- The market periods invoiced in M+1 are typically the following (where M = month):
 - Yearly, seasonal and quarterly auctions for M+2
 - Monthly auctions for M+1
 - Returns for M+1
 - Rights remunerations (FTR Payout) for M-1
 - Any other compensations for M-1

For example:

| |
|---|
| Invoicing Run in April 2016 (M+1) – JAO invoice |
| Yearly auctions for May 2016 (M+2) |
| Monthly auctions for April 2016 (M+1) |
| Returns for April 2016 (M+1) |
| Any other compensations (FTR Payout, Curtailment compensation) for March 2016 (M) |

3. Will there be any FTR market trials before go-live?

Yes. We intend to test the main scenarios in the week from the 22nd to 26th January 2018. It is likely that users will need to be dedicated to interacting with this, albeit one per company is sufficient. Depending on the results from this we have a second week for scenarios from the 5th to 9th February 2018. During this second week it's likely that some of the system outputs would be simulated for users to access, e.g. FTR payout and settlement.

For anyone who has registered with JAO by December, they'll have connectivity to the live JAO environment so configuring access to the test environment should be trivial. We'd hope to complete that by the 17th January for all participants.

There is an addition for anyone who will be using web services as at least one participant has confirmed use of these. We're trying to line up web service testing from the start of January if not before. If you intend to use these, please let us know so that we can plan accordingly.

4. How does curtailment apply for FTRs?

In the current market arrangements, where an interconnector has unplanned reduced capability, all capacity holders have their rights reduced pro-rata. Under the HAR and Regional Annex, FTRs are significantly more firm. FTRs may only be 'curtailed' in limited circumstances and in the vast majority of cases this will have no impact on the payment received by FTR holders. A cap applies for the total amount of curtailment compensations that will be paid out in one month and FTR payments will only be impacted if this cap is breached.

See Appendix 4 for a worked example on this.

5. Does the Participation Agreement get updated with new borders? What does this mean for me, do I need to re-sign it? How does this work for Ireland-GB specifically?

There won't be a GB-Ireland annex in the Participation Agreement. The Annexes in the Participation Agreement are for auctions which are not covered by the HAR and have separate rules (i.e. Swiss Long Term Rules, Daily, Intraday, Shadow Auction Rules).

Signing up to the Participation Agreement means the HAR rules will apply. Existing JAO registered Participants would have needed to fill out the 'Amendment No. 1 to Participation Agreement'. This is not relevant for new registrations.

6. Is an Auction Tool User account form needed for each user? Is there a limit to the number of users?

You need to fill out one form per user. There is no limit on the number of users. Most companies would have about 5 users, with the biggest having 15.

7. Where do I get a Digital Certificate?

A digital certificate is an electronic 'passport'. As part of user registration with JAO, the digital certificate you intend to use needs to be identified.

The JAO 'Information System Rules' document is available from <http://jao.eu>:

Support > Resource Center > eCAT – New Auction Tool > Information System Rules

Appendix 1 outlines the desktop software requirements to access the JAO auction tool while Appendix 2 provides details on the digital certificates that are supported by JAO. The JAO list of trusted certificate authorities is available from <http://jao.eu>:

Support > Resource Center > eCAT > Trusted certificate authorities

8. What Certificate serial number should be included on the user account form?

The serial number from the digital certificate should be input here (you may find it in the public part of the certificate under the Details tab as Serial number). The public part of the certification (in a cer format) should also be provided.

These should be submitted through the JAO Service Desk (<http://helpdesk.jao.eu>), pdf and cer file together.

9. Is the signature card intended for the people who will draw down funds from the business account and therefore the people who have been given power of attorney?

Yes – it is for those receiving delegated authority (i.e. will be signing for transfers).

10. Is a Power of Attorney (POA) form required per person?

Yes – one per person for anyone signing for a funds transfer. Typically there would be 2 or 3 signatories per company. A company signatory would need to delegate authority to themselves also if they will sign for a funds transfer.

If required, JAO can also set it up that at least two signatures are needed.

11. Is the 'funds transfer request form' only required when funds need to be transferred or does the Participant need to complete this in advance of "Go-live" to have the transfer details in place?

The form would typically be filled out as required, i.e. after go-live when funds are received and to be withdrawn. The transfer is to the bank account specified in the participation agreement

12. How do I get an electronic certificate? The current certificate comes from SEMO for use on AMP – will this still be the same for JAO?

SEMO will not support the use of certificates as occurs today on AMP. With JAO it is up to the individual participants to source the certificates that they wish to use. If you already have a supplier that is not on the JAO approved list, we can get them to test it and add if appropriate.

Often the certificates can only be provided on a per user level as they are a form of individual user identity, however there are exceptions such as a company cert for web service (computer-based) access. It's best to tease this out directly with JAO or try it when requesting user access.

When JAO set-up users they can be set-up as full access, or read-only users.

13. Can I use a SEM or I-SEM digital certificate?

As part of the Moyle & EWIC implementation project the current SEM and new I-SEM certificates will be testing and if successful will be added to the list of trusted certificate authorities. Note that these certificates are provided by EirGrid Group under other market agreements. To have full control over certificate expiry and security it may be better for registered participants to source their own certificates for interacting specifically with JAO.

Appendix 3 – FTR Market Trial Training survey

A training survey form is being issued to understand the training need on e-CAT and FTR markets. Upon submission of the completed forms to the interconnector owners (moyle-ewic@jao.eu), the needs of individual companies and on the whole will be assessed in order to propose an appropriate training programme. [The form is also available from http://jao.eu](http://jao.eu).

Support > Moyle and EWIC Interconnectors Project > Market Trial > Formal Market Trial

Appendix 4 – FTR Worked Examples

Ordinary course of business calculation of FTR payouts (loss-adjusted market spread)

The FTR payout for each hour is the positive loss adjusted market spread in the relevant direction.

| SEM Price | GB Price | Losses | LAMS | |
|-----------|----------|--------|----------------------|----------------------|
| | | | GB-SEM | SEM-GB |
| X | y | z% | $\max(0, x-y/(1-z))$ | $\max(0, y-x/(1-z))$ |
| 50.00 | 40.00 | 2.36% | 9.03 | 0.00 |
| 40.00 | 50.00 | 2.36% | 0.00 | 9.03 |
| 50.00 | 40.00 | 4.68% | 8.04 | 0.00 |
| 40.00 | 50.00 | 4.68% | 0.00 | 8.04 |

Calculation of FTR payouts - trip after day-ahead firmness deadline

FTRs are firm after the day-ahead firmness deadline so a trip has no impact on FTR payouts for the trading day D in which the trip occurs.

| SEM Price | GB Price | Losses | LAMS GB-SEM | SEM-GB | |
|-----------|----------|--------|----------------------|----------------------|--|
| x | y | z% | $\max(0, x-y/(1-z))$ | $\max(0, y-x/(1-z))$ | |
| 50.00 | 40.00 | 2.36% | 9.03 | 0.00 | |
| 40.00 | 50.00 | 2.36% | 0.00 | 9.03 | |
| 50.00 | 40.00 | 4.68% | 8.04 | 0.00 | |
| 40.00 | 50.00 | 4.68% | 0.00 | 8.04 | |

The FTR payout for each hour is still the positive loss adjusted market spread in the relevant direction, i.e. FTR holders are not impacted by a 'within day trip' as curtailment may not occur.

Calculation of curtailment compensations (pro-rata loss-adjusted market spread) - trip before day-ahead firmness deadline

FTRs can be curtailed before the day-ahead firmness deadline so a trip *may* impact on FTR payouts (curtailment compensation) for the trading day D+1 after a trip occurs.

The default position is that FTR holders should still receive curtailment compensation equal to the loss adjusted market spread but curtailment compensations are capped.

The cap is broadly equal to the interconnector's total auction and congestion income in that month less FTR payouts made in that month (please refer to HAR for further detail).

If an interconnector has an outage meaning that the curtailment compensations exceed the monthly cap, the curtailment compensations will be reduced pro-rata:

| LAMS | | | | | Uncapped expected curtailment compensation in month (a) | Interconnector income available for compensation cap in month (b) | Pro-rata adjustment: $\min(1, (b)/(a))$ | Curtailment compensation (LAMS pro-rata) | |
|-----------|----------|--------|------------------------|------------------------|---|---|---|--|--------|
| SEM Price | GB Price | Losses | GB-SEM | SEM-GB | | | | GB-SEM | SEM-GB |
| x | y | z% | $\max(0, x - y/(1-z))$ | $\max(0, y - x/(1-z))$ | | | | | |
| 50.00 | 40.00 | 2.36% | 9.03 | 0.00 | 108,398.20 | 150,000.00 | 1.00 | 9.03 | 0.00 |

Scenario assumes a curtailment for 24 hours.

- (a) LAMS for 24 hours, and 500MW of curtailment
- (b) illustrative amount, to demonstrate pro-rata approach

In the above, curtailment compensation for each curtailed hour is still the loss adjusted market spread as the cap on curtailment compensations has not been reached, i.e. there is no pro-rata adjustment and FTR holders are not impacted by the outage and subsequent curtailment.

In the below example, the curtailment compensation is reduced pro-rata as the cap on curtailment compensations has been exceeded:

| LAMS | | | | | Uncapped expected curtailment compensation in month (a) | Interconnector income available for compensation cap in month (b) | Pro-rata adjustment: $\min(1, (b)/(a))$ | Curtailment compensation (LAMS pro-rata) | |
|-----------|----------|--------|------------------------|------------------------|---|---|---|--|--------|
| SEM Price | GB Price | Losses | GB-SEM | SEM-GB | | | | GB-SEM | SEM-GB |
| x | y | z% | $\max(0, x - y/(1-z))$ | $\max(0, y - x/(1-z))$ | | | | | |
| 50.00 | 40.00 | 2.36% | 9.03 | 0.00 | 108,398.20 | 100,000.00 | 0.92 | 8.33 | 0.00 |

Due to the monthly cap, FTR payouts would only be expected to be reduced where there is a long unplanned outage of an interconnector. Otherwise, FTR holders can expect to receive the full positive LAMS, regardless of short duration outages.

Appendix 5 – Loss-Adjusted Market Spread Publication during the I-SEM Market Trial

The Loss-adjusted Market Spreads (LAMS) will be published during the I-SEM Market Trial. The information will be presented in an excel format with the following information:

- Day-ahead GB price
- Day-ahead SEM price
- LAMS for each of Moyle and EWIC, in each direction, and for each hourly⁹ period

Note: The price publications above will be data from the I-SEM market trial only. After I-SEM go-live we expect that static links to the NEMO websites with this data will be provided.

The publication will be done via the <http://test.jao.eu/main> > TSO Message Board.

⁹ If any Day-Ahead Fallback scenarios occur during the I-SEM Market Trial, the applicable ½ hourly values will be published.

Appendix 6 – JAO Registration Guide

GUIDE TO REGISTRATION FOR MARKET PARTICIPANTS

This guide was written to help future Market Participants through the registration process with JAO. In this document, we have tried to collect all the important information regarding the process, but in case you have additional questions or need further clarification, please do not hesitate to contact us via phone (+352 27 62 38 38) or through our ticketing platform (<http://helpdesk.jao.eu>).

All the relevant documents and forms requested for registration are available on the JAO website under the “Support” tab / “Resource center” in the “JAO Registration” Section: <http://www.jao.eu/support/resourcecenter/overview>.

IMPORTANT NOTES before you start to fill out the forms:

1. Only electronically filled forms with handwritten signatures can be accepted, and an official English translation must be provided for any document which is not written in English. JAO requires hard copies for accurate record keeping and to verify the authenticity of the documents.
2. It is required to provide the registration documents no later than 7 working days before the auction in which you intend to participate. JAO shall assess the completeness of the information submitted within 5 working days of receipt of the documentation. Before the expiration deadline of the 5 working days, JAO shall ask the Participant to provide any outstanding information/document which he failed to submit. Once the information is received, JAO has an additional 5 working days to review the information and inform the Market Participant if further information is required.
3. Prior to sending the registration documents by postal mail to JAO, we strongly advise you to send electronic version of the completed documents through our ticketing system (<http://helpdesk.jao.eu>) in order to be verified.

REGISTRATION OF A COMPANY

In order to register a company we require as a first step the following documents:

1. Participation Agreement

We shall receive 2 originals, one will stay with JAO and the other countersigned document will be sent back to the Participant.

Please make sure you use the latest version (download the form from our website just right before you start to fill it out).

Only the Participation Agreement has to be sent, the *Amendment No. 1. to Participation Agreement* and the *Amendment No. 2 to Participation Agreement* are available on our website only for those companies which are already registered with us, but they signed an older version of the Participation Agreement which did not contain the short term auctions / the separate long term rules for Swiss borders.

Details to pay attention to:

- Page 1:
Please enter your company name and registered address (as stated in the Commercial Extract)
- Page 3:
The Participation Agreement has to be signed by authorized person(s) as per the company's signatory rights (**joint signatures** or a **sole signature**) as stated in the Commercial Extract or in an additional official document.
Electronic signatures cannot be accepted on the Participation Agreement.
- Pages 5-6:
It is important to provide a valid EIC code and VAT number. As one of the first steps JAO checks the provided codes in the relevant databases. If JAO is not able to verify the EIC code / VAT number / the company details (name, display name, country, postal code) are not matching, the registration cannot be started.
All 4 contacts have to be filled out – General correspondence, Financial contact person, Operational contact person and Commercial contact person.
- Page 7:
The *Additional declarations for Allocation of Long Term Transmission Rights* have to be agreed to, either Yes-No or No-Yes, both **cannot** be selected. This declaration is to decide if the Participant wants to participate only in transfer of Long Term Transmission Rights (Yes-No) or also in Auctions (No-Yes). If the Participant wants to participate only in transfer, then it is unnecessary to open a Business Account as the payments will be handled between the Parties, JAO is not involved in it. In case the Participant chooses to participate in Auctions, then he is automatically given all the entitlements to participate in the long term auctions (all monthly and yearly auctions, except on the Swiss borders – CH<>DE, CH<>AT, CH<>IT, CH<>FR). For long term auctions JAO do not require any TSO agreement, however, to nominate and to use acquired capacity, Market Participant needs to follow the local nomination rules (have the TSO agreement(s) with the concerned TSOs). The future Participant always has to provide his corporate bank account details, even if he participates only in transfer of Long Term Transmission Rights, as all payments (compensation) from JAO will be made to this account.

Under the *Declarations for other processes and Additional Rules*, the acceptance of the Additional Rules are optional, they should be accepted only if the Participant wishes to participate in one or more daily, intraday, shadow or long-term Swiss auction(s). The Allocation rules for the daily, intraday and shadow auctions contain the pre-requisites (agreements are needed with the TSOs), which a Participant has to meet

in order to have the necessary entitlements for the selected auctions. These can be found on our website (<http://www.jao.eu>) under Support/Resource center/Auction rules (Annex 1 or Annex 2 of the Daily-, Intraday-, Shadow Rules - *List of agreements per Bidding Zone border needed with the concerned TSOs or other legal entities depending on the relevant national legislation to be entitled to nominate the allocated Transmission Rights*). If 'Yes' is selected for any of the first 3 Additional Rules then the Participant shall select the Bidding Zone border(s) for which he wishes to be registered in the relevant Attachment (4/5/6). In case of CEE, HR-RS and long term Swiss auctions, there is no dedicated attachment, as the Participant will receive the entitlements for all auction borders in this regions automatically in case he accepts the Additional Rules.

- Page 9:
The *TSO designation* selection asks the Participant to state to which German TSO acquired Physical Transmission Rights shall be attributed. **Only one** can be selected for each border pair. This can be changed anytime by sending a Modification Request with page 9 attached in two originals via post.
- Pages 10-12:
Attachments 4, 5 and 6 ask the Participant to select the Bidding Zone borders, where he wishes to be registered in.

2. Financial Agreement

We shall receive 2 originals, one will stay with JAO and the other countersigned document will be sent back to the Participant.

In case the Participant chooses to participate only in transfer of Long Term Transmission Rights, then no Financial Agreement is signed as no business account is needed to open for this Participant.

Details to pay attention to:

- Page 1-2:
The date and the Business Account number will be filled by JAO, please leave them empty.
- Page 11:
The Financial Agreement has to be signed by authorized person(s) as per the company's signatory rights (**joint signatures** or a **sole signature**) as stated in the Commercial Extract or in an additional official document.
Electronic signatures cannot be accepted on the Participation Agreement.

3. Commercial Extract

The Participant needs to send an original or an electronically certified extract from the Commercial Register / Trade Register or in case of a new company, the Constitution Deed.

This should not be older than 3 months and a notarized English translation has to be attached in case it is in a different language.

If the signatory rights in the Commercial Extract are not clear (who and how many signatures are needed to engage the company externally), the Participant needs to provide an additional official document which makes these rights clear.

Upon registration, JAO will send one counter signed copy of the Participation Agreement and one counter signed copy of Financial Agreement to the Participant.

REGISTER TO JAO'S TICKETING SYSTEM

To improve our communication with the Market Participants and have a clear track on requests, JAO started to use a ticketing system instead of the emails. All questions and requests are now handled through this ticketing platform, emails will be shortly rejected. Therefore we ask all newly registered Participants to register to the system as soon as they receive the confirmation of the registration with JAO (or even before, if they have questions regarding the registration process).

To register/ log in please visit: <http://helpdesk.jao.eu>

Participants may find a user guide how to register and use the system on our website: Support/Resource center/JAO Registration.

REGISTRATION OF USER(S) TO THE ALLOCATION TOOL

A Participant may register as many users as you deem necessary. However; we recommend to limit the access due to security reasons.

To register a user in the Allocation Tool (eCAT), the registered Participant has to send the following two files through our ticketing system:

1. User Account form

This form has to be signed by the user and by the authorized person(s) of the company as per the company's signatory rights (**joint signatures** or a **sole signature**) as stated in the Commercial Extract or in an additional official document. In case the Participant wants to appoint a person who is responsible for signing the user account forms, he shall send a duly signed internal Power of Attorney.

It can be signed by hand or digitally as well, just make sure that all the signatures are in the same form.

We do not require to receive original copy of this form, it can be sent in **soft copy** through our ticketing system.

Details to pay attention to:

- Please make sure that the type of the request (setup / modification / deletion) and the type of access (full access/read only) are selected.
- The Certificate Serial number can be found in the public part of the certificate under the *Details* tab as *Serial number*

2. Public part of the electronic certificate

All registered users are requested to get an electronic certificate from a certificate issuing authority (you may find a list of recommended providers on our website under Support/Resource Center/eCAT - New Auction Tool). The electronic certificates are entitled to help systems to authenticate the person behind the login. The document *Information System Rules* (available also on our website under Support/Resource Center/eCAT - New Auction Tool) describes the technical requirements for Certificates (you may provide these information to the certificate issuing authority). Once the electronic certificate is available the user has to install the certificate on his computer and after installation he can export the public part which he shall send to JAO (in **.cer format**).

ADDITIONAL DOCUMENTS

1. Documents for fund transfer

In case a dedicated bank account was opened for the Participant during the registration, he should send the following documents - after receiving back the registration documents with the bank account details - in order to appoint person(s) who will be able to request fund withdrawal from this account to his corporate bank account (which was provided in the Participation Agreement):

I. JAO Power of Attorney (original)

For the person(s) who will be allowed to ask for movements under the bank account. (Preferably our form but we can also accept other form if it contains all the necessary information). The POA has to be signed by authorized person(s). The person can be the authorized signatory himself.

II. JAO Signatory Specimen form (original)

Signed by the person(s) who received the power

III. ID card copies (soft copy)

The **JAO Fund transfer request** form can be sent in soft copy. It has to be filled out electronically, and only the person(s), who is (are) authorized in the Power of Attorney form(s) can request the transfer. Other requests will be declined.

2. Bank Guarantee

If the company wishes to have a bank guarantee, our template (on www.jao.eu under Support/Resource center/JAO Registration) should be filled out by the bank, undersigning that he will take responsibility for the company's liabilities up to the stated amount. This template should not be altered by the bank, otherwise it will be rejected by JAO.

The Participant shall submit the bank guarantee at least 2 working days before the auction closure to which it shall be used as collateral.