

I-SEM Interconnector Losses

Information Paper

2nd June 2017



Introduction

The Trading and Settlement Code requires the TSOs, EirGrid and SONI, to calculate Transmission Loss Adjustment Factors (TLAFs) for all generator units and interconnectors. The trading rules currently in force states that TLAFs for interconnectors should be calculated with regard to the TSOs' expectation of the predominant direction of flow.

While this was appropriate in the context of the locational signals in SEM, further integration of the market with Europe requires the TSOs to determine loss factors for the interconnectors to be used in Day Ahead and Intra-Day Markets that are consistent with the market coupling rules. These rules require that interconnector loss factors reflect the actual losses across the interconnector in question to ensure that accurate signals are sent to the market and that eventual interconnector flows reflect the arbitrage between price zones. These loss factors should not include on-shore losses, which are to be accounted for elsewhere.

This short paper summarises the factors that the TSOs have taken into account, when proposing TLAFs to be applied for the interconnectors, in the balancing market, following I-SEM go-live.

Governance

After I-SEM go live, interconnector loss factors will be used in the ex-ante markets, the balancing market and for imbalance settlement. The ex-ante market loss factors must be agreed and approved at a regional level, while the balancing market/imbalance settlement loss factors must be approved by the SEM Committee.

Ex-Ante Markets

The ex-ante markets in the I-SEM are designed to be consistent with the European Regulation on Capacity Allocation and Congestion Management (CACM Regulation)

To comply with CACM, the TSOs must:

- Ensure optimal use of the transmission infrastructure
- Facilitate efficient price formation in the ex-Ante markets
- Respect cross-zonal capacity constraints (losses restrict the actual cross-zonal capacity available)

In its design of the I-SEM Energy Trading Arrangements, the SEM Committee consulted on the approach to interconnector losses.

Two approaches were considered for the treatment of interconnector losses:

1. Utilising a single loss factor, i.e. the loss factor would be a weighted average of EWIC and Moyle loss factors; or,
2. Utilising a separate loss factor for each interconnector.

The conclusion of this exercise was that separate loss factors would be applied for each interconnector.

On 15th December 2016 the TSOs presented various options to National Regulatory Authorities (Ofgem, UREGNI and CER) at the Joint Implementation Group. The options considered various methods for calculating losses on the interconnectors, that had been developed in consultation with the Interconnector Owners and the team involved with the EUPHEMIA integration. One proposal was recommended to the Group, based on its viability of integration with EUPHEMIA, compliance with CACM, allocation of risk and achievement of efficient flows.

Ex-Ante Market Loss Factors

The principle change for I-SEM ex-ante markets is that the interconnectors are treated as a lossy line, irrespective of direction, with no associated transmission network losses. When considering Moyle and EWIC in this regard, the only losses applicable are the actual technical losses per MW flow. The interconnector's losses are determined on the basis of quadratic equations. These take into account converter station losses, no-load losses and I²R cable losses.

Linear loss values are then derived from the Interconnector's relative quadratic losses, using a (0,0) intercept point. Linear losses are required as EUPHEMIA requires a linear input, and the quadratic losses would result a variable percentage loss over the dispatch range. The relevant curves for EWIC and Moyle are shown in the figure below, along

with the fixed percentage loss factors to be applied in EUPHEMIA. The resultant loss values are as follows:

- Moyle: 2.36%
- EWIC: 4.68%

These have been Included in the Proposed 2017/18 TLAfs which will be submitted for approval by all relevant Regulatory Authorities on 23rd June 2017.

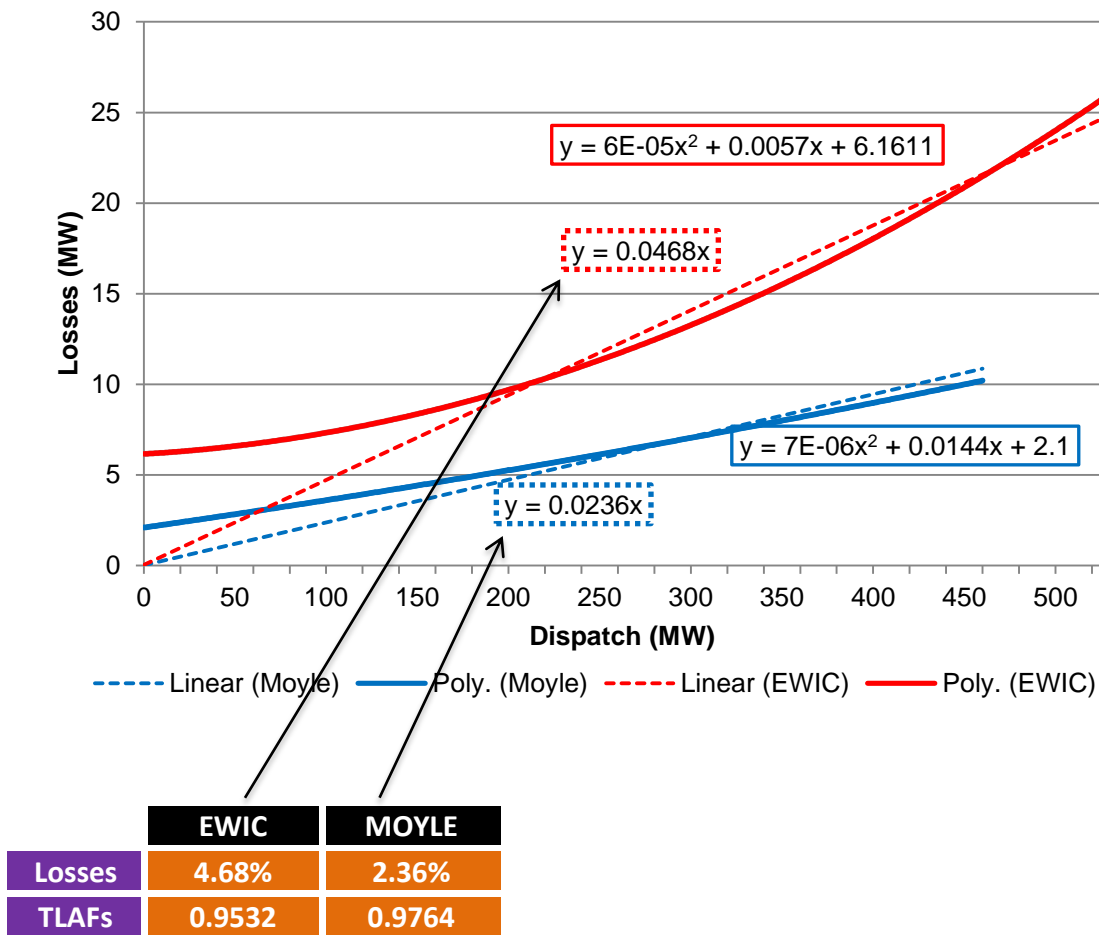


Figure 1: Ex-Ante Market Loss Factors

Balancing Market Loss Factors

The loss factors to be applied in the balancing market are subject to local governance.

Trading and Settlement Code update

To allow for alignment between market timeframes and the implementation of other SEM Committee decisions, an amendment was made to the relevant section of the Trading and Settlement Code to apply after I-SEM go-live. This has been developed through the Rules Liaison Groups and consulted upon by the SEM Committee, ahead of designation of the new code on 23rd May 2017.

The new requirement reads:

“In determining Transmission Loss Adjustment Factors the System Operator shall incorporate Transmission Losses incurred on the relevant Interconnector as estimated by the System Operator in consultation with the Interconnector Owner.”

Balancing Market

Any difference between the loss factors applied in the ex-ante markets and the balancing market would result in an imbalance that would not be controllable by the Interconnector Owners or TSOs. The TSOs therefore proposed that the same linear loss values for each interconnector are used in both EUPHEMIA and the Balancing Market.

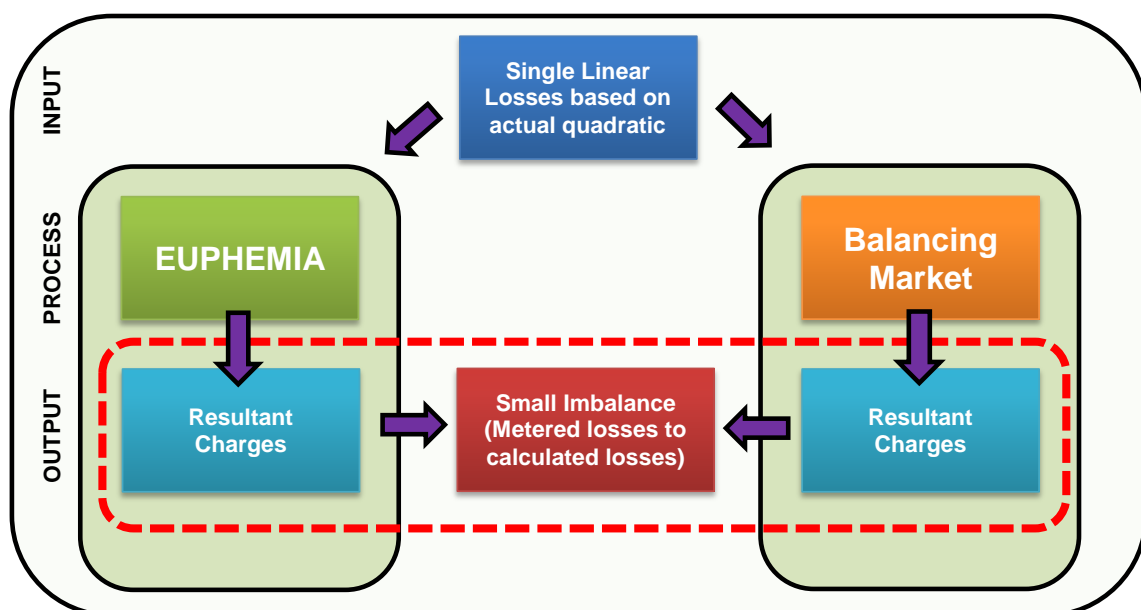


Figure 2: Proposed option of Losses in the Balancing Market

This provides consistency between the best estimate of losses (through using losses determined using their technical actual losses) and resultant metered losses.

A number of options were considered by the TSOs and presented to UREGNI and CER. The approved option was the only option from all considered by the Regulators that provided the following assurance:

CACM Compliant?	✓	Compliant as losses are derived for the interconnector flows only
Imbalance Costs	✓	As the loss factors are the same for both markets there will only be a small imbalance found between metered values and actual losses
Efficient Interconnector Flows	✓	Actual losses across the interconnectors provides efficient market scheduling
Risk Association	✓	Minimal market imbalance removes complexity of ex-ante calculation

Regulatory Endorsement

Regulatory endorsement of the proposed option (applying linear loss factors that are approximate to the actual technical losses) was received on 23rd February 2017.

“I can confirm on behalf of both authorities that we are content with the approach recommended in the slidepack (Option 2A) for the treatment of losses on the interconnectors in the calculations being carried out for this / next year.”

The approved option ensures that:

- There will be consistency between the loss factors used in the ex-ante markets and the balancing market
- There should not be any material errors introduced by the losses approach as:



Interconnector Loss Values and TLAFs

Loss values are the required format for EUPHEMIA; for reference TLAFs are equal to (1-Loss Values), so the resultant TLAFs are:

- Moyle: 0.9764
- EWIC: 0.9532