I-SEM Energy Trading Arrangements
Transparency of Imbalance Pricing process

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1 Introduction

This paper describes proposed measures to provide for the transparent calculation of Imbalance Prices in the I-SEM Balancing Market arrangements.

The processes that feed into the Imbalance Price calculation will be set out in a number of codes, including Part B of the Trading and Settlement Code (TSC) and the Grid Codes, and are further described in a Balancing Market Principles Statement (BMPS) and a Methodology for determining System Operator and Non-Marginal Flags. This document aims to provide a holistic view of all processes related to Imbalance Pricing and the related transparency measures proposed.

This paper considers the requirements for transparency under each of the following timeframes and how the proposed arrangements provide for these requirements:

- **Long-term Ex-ante Transparency** (e.g. rules, agreed procedures, information on processes, parameters, etc.) – important to provide certainty and understanding of the factors that influence price outcomes and the basis/methodology for calculating the price.
- **Short-term Ex-ante Transparency** (e.g. forecast information, ex-ante trading information) – important for ex-ante information to available on the input data that will be used to calculate prices in accordance with rules, procedures and parameters, hence enabling participants to reach their own view on likely price outcomes so as to develop their market strategies, bids/offers.
- **Short-term Ex-post Transparency** (e.g. imbalance pricing information close to real time) – important for participants to monitor actual outputs against their projected outcomes, track price outcomes against their dispatch outcomes to confirm dispatch is consistent with published prices or vice versa, and to adjust market positions and strategies for future transactions.
- **Long-term Ex-post Transparency** (e.g. provision of settlement information, audit reports) – important to confirm accuracy of settlement amounts, and accuracy of market systems and processes in delivering outcomes that are consistent with the intended design, rules and procedures.

2 Long-term Ex-ante Transparency – Codes, Statements and Methodologies

The rules governing Imbalance Pricing are set out in detail in Chapter E and Appendix N of the TSC, where the Market Operator has primary responsibility for the calculation of the Imbalance Price. The rules set out in Chapter E and in Appendix are deterministic in nature with little allowance for subjectivity in their application.

The rules in Chapter E of the TSC (and in Appendix N) use a number of key inputs from Market Participants, Regulatory Authorities and System Operators.

Regulatory Authorities provide / approve key parameters for the calculation of Imbalance Prices by the Market Operator. These are set out in Chapter E and include the De Minimis Acceptance Threshold, the Price Average Reference Quantity, the Full Administered Scarcity Price and Reserve Scarcity Price Curve. The Market Operator is required to publish the approved values of these parameters.

Market Participants provide Physical Notification Data, Commercial Offer Data, Technical Offer Data and Registration Data to the Market Operator, which is in turn provided to the System Operator. These values are published on various timescales as set out in Appendix E of the TSC.

Operation of the systems in Ireland and Northern Ireland is governed by the System Operators' respective licences and the respective Grid Codes in Ireland and Northern Ireland. To provide transparency on the processes involved in the operation of the system, the System Operators are required to publish a BMPS, which provides more detailed information on the statutory duties of the System Operators and how they give effect to these duties, including the determination of the Indicative Operations Schedule. A draft BMPS will be published for consultation in April.

The System Operator uses the information provided to determine an Indicative Operations Schedule, which is based on a constrained optimisation of the resources available, taking into account the operational security requirements, priority dispatch and other statutory requirements. Informed by the Indicative Operations Schedule, the System Operator issues Dispatch Instructions, taking into account the real time state of the system, the real time availability of resources and the real time demand, which may vary from the information used to the determine the Indicative Operations Schedule e.g. in the case where a unit trips unexpectedly. More information on the scheduling and dispatch process is included in section 4 of the draft BMPS.

The Indicative Operations Schedule and its inputs are used by the System Operator to determine a set of flags for the Imbalance Pricing calculation. These flags include a System Operator Flag, Non-Marginal Flag and a System Service Flag[1] for each Generator Unit for each Imbalance Pricing Period. The requirements for these calculations are set out in Appendix N of the TSC, which also includes a requirement for the System Operators to publish a Methodology for determining System Operator and Non-Marginal Flags. This document, when read in tandem with the BMPS and associated documents, will provide transparency on the operational processes involved in scheduling and dispatch and how the information used during these processes feeds into the automated calculation of System Operator Flags, Non-Marginal Flags and System Service Flags. A draft Methodology for determining System Operator and Non-Marginal Flags will be published alongside the BMPS that is being issued for consultation.

Based on stakeholder responses to the Regulatory Authorities' consultation on the draft TSC amendments, it is clear that there needs to be greater transparency in relation to the roles and responsibilities in the area of System Operator flagging. The calculation of flags, and the transactions that are related to the provision of information from the System Operator to the Market Operator, are now more clearly defined in Chapter E, Appendix N and Appendix K of the TSC. This provides greater clarity than the draft version of the TSC amendments that was published for consultation in November 2016, which stated that the flags were to be calculated by the Market Operator, and it was not clear from where the Market Operator would obtain the information to do so. The calculation of these flags requires a significant amount of operational data and is automated in the System Operators' systems, built around the scheduling optimization tools. This automation is essential to deliver timely outcomes for the market and to remove subjectivity from the process.

[1] The System Service Flag is used for Capacity Market Settlement and is not used in the Imbalance Pricing process.

The TSC now more accurately assigns this responsibility and any calculations associated with the Indicative Operations Schedule to the System Operators (as the Market Operator does not have this information). The resultant flags (calculated at unit level), are then mapped onto the Accepted Bids and Offers by the Market Operator (as the System Operators do not have the information on the Accepted Bids and Offers).

It is emphasised that no change has been made to the Imbalance Pricing calculation under the TSC. The only change in this regard is that the TSC now more clearly and definitively describes where the responsibility for each component of the Imbalance Pricing inputs resides. This, combined with an additional TSC obligation on the System Operators to publish detailed information on the methodology used to calculate the flags, the licence obligation on the System Operators to develop, maintain and publish a BMPS provides a high level of transparency into this important process.

These codes, statements and methodologies to be published by the Market Operator and System Operators provide transparency on how the Balancing Market is to be operated – both in respect of the deterministic rules set out in the TSC and in the processes for scheduling and dispatch that form inputs to the Imbalance Pricing rules. The above rules also provide for a set of publications of parameters, reports, tariffs, factors etc. that are set from time to time, annually and monthly. These are set out in Appendix E of the TSC.

3 Short-term Ex-ante Transparency – Forecast data, Trading Information

In order to promote efficient trading, it is important that information on the forecasted state of the system is made available to Participants in sufficient time to enable to them to adjust their positions in the Ex-Ante Markets accordingly. Aside from the information coming out of the Day-Ahead and Intraday Markets, the TSC provides for the publication of important information such as the System Operators' four day wind and demand forecasts for the following Trading Day.

In addition, the TSC provides for a forecast imbalances report published every hour, containing the sum of Physical Notifications, the net interconnector schedule, the System Operator demand and wind forecasts and the resulting projected imbalance for each Imbalance Pricing Period in the next Imbalance Settlement Period until the end of the latest Trading Day for which the Day Ahead Market has closed. This report provides market participants with important information on how long or short the system is projected to be. The projected level of imbalance on the system in an Imbalance Pricing Period is a key indicator of the likely level of the Imbalance Price e.g. where the system is 1000MW short, it is likely that high Imbalance Prices will result if participants do not reduce the level of imbalance through further trading.

These values are published as set out in Appendix E of the TSC.

Though not yet included in the TSC, the Market Operator is also progressing requests from participants to publish Final Physical Notifications for all Generator Units after Gate Closure rather than on TD+1.

4 Short-term Ex-post Transparency – Imbalance Pricing Information

A key Balancing Market report will be published for every Imbalance Pricing Period including the following information: Imbalance Price, Net Imbalance Volume Quantity, Demand Control

Quantity, Marginal Energy Action Price, all Accepted Bid and Offers, System Operator Flags, the Non-Marginal Flags, the Net Imbalance Volume Tags and Price Average Reference Tags.

These values are published as set out in Appendix E of the TSC.

Though not yet included in the TSC, the Market Operator is also progressing requests from participants to publish further reports in relation Short Term Reserve Quantities and Operating Reserve Requirement Quantities, which are key inputs to Administered Scarcity Pricing.

5 Long-term Ex-post Transparency – Imbalance Pricing Information, Audit, Change Control

Appendix E of Part B of the TSC sets out all the information published on a Settlement timescale. This information provides for shadow settlement and any longer term analysis of market outcomes.

In addition to this, the Imbalance Pricing calculation as set out in the TSC will be subject to audit under the Market Audit and the scheduling and dispatch process will be subject to audit under the System Operators' licences.

Finally, the Modifications Panel, Grid Code review Panel and the Regulatory Authorities provide the necessary channels to raise changes to the rules and process set out above.