

Single Electricity Market

Monitoring the Divergence of the market Schedule from Dispatch and the Impact on Consumers

Decision Paper

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Appendix 1 Description of Metrics for Assessing impact of the divergence of the market schedule from dispatch on consumers

1 Introduction

This paper reports on the results of the consultation SEM-11-002 and gives the SEM Committee's decisions on the matters covered therein i.e. the metrics to be used for monitoring the divergence of the market schedule from the dispatch, for the purpose of assessing material harm that can be shown to impact negatively on the ability to meet SEMC objectives in the context of the overall strategic direction of the SEMC

1.1 Background

On August 26th the Single Electricity Market Committee (the SEM Committee)¹ published a decision paper on principles of dispatch and the design of the Market Schedule in the Trading and Settlement Code.² In that paper the SEM Committee decided that no action is currently required in relation to the underlying construction of the Market Schedule and the allocation of infra marginal rent (IMR) behind constraints.

The SEM Committee also noted the developments in relation to compliance with the European target model and that no fundamental changes to the SEM High Level Design are envisaged in the interim period unless they are clearly warranted on grounds of 'material harm' to end customer as determined by the SEM Committee. Should this arise, any proposed changes will be fully consulted upon in accordance with SEM Committee's previously published decision making framework and will be necessary and proportionate, taking account of the drivers for the material harm that has arisen.

The SEM Committee published a consultation paper (SEM-11-002) regarding its proposed approach to the assessment of material harm to final electricity customers in the SEM in January of 2011.³ This paper sets out the SEM Committee's decision on the approach to the assessment of material harm, specifically the metrics to be monitored by the SEM Committee in that context.

This paper does not consider market design policy measures.

1.2 Responses to the Consultation Paper

Responses to the consultation paper were received from the following parties and are published on the All-Island Project website along with this decision paper.

Bord na Móna PowerGen
Irish Wind Energy Association
National Electricity Association of Ireland
Viridian Power and Energy

EirGrid Group
Synergen
Endesa Ireland Ltd.
Gaelectric Energy Storage

¹ The SEM Committee is established in Ireland and Northern Ireland by virtue of section 8A of the Electricity Regulation Act 1999 and Article 6 (1) of the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 respectively. The SEM Committee is a Committee of both CER and NIAUR (together the Regulatory Authorities) that, on behalf of the Regulatory Authorities, takes any decision as to the exercise of a relevant function of CER or NIAUR in relation to an SEM matter.

² Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code: SEM Committee Decision Paper, 26th August 2011, SEM-11-062

³ Monitoring the Divergence of the Market Schedule from Dispatch and the Impact on Customers: Consultation Paper, 18th January 2011, SEM-11-002

NIE Energy Power Procurement Business
ESB Wind Development Ltd.
The Consumer Council
Single Electricity Market Operator

Bord Gáis Energy
NIE Energy Supply
SSE Renewables

2 Overview of Responses

2.1 Introduction

In September 2010, the SEM Committee indicated the intention to set out a framework for the assessment of 'material harm' to end customers in its Proposed Position Paper on principles of dispatch and the design of the Market Schedule in the TSC. This was in the context of the potential for further divergence between dispatch and the Market Schedule and of the issue of allocation of IMR behind constraints.⁴ In that paper the SEM Committee stated that the assessment of material harm should be measured against three key SEM legal objectives as follows:

- protection of end customers, the need to ensure costs are appropriate being noted in this regard;
- security of supply, and
- sustainability and facilitation of renewable targets.

In January 2011, the SEM Committee published the consultation paper on the assessment framework. This paper re-iterated the three key objectives as above and discussed the potential measures/key market performance indicators that could be monitoring The SEM Committee's recommended indicators were set out as follows:

1. constraint payments;
2. proportion of energy payment attributable to constraints;
3. infra marginal rents earned through constraint payments, and
4. constrained running.

The paper stated that other measures such as generator profits, environmental indicators, the cost of market system developments and security of supply are all tracked elsewhere and will be considered by the SEM Committee in the wider context as required given the outcome of the monitoring of the above four indicators that focus on constraints (costs and volumes). It was recommended that the four indicators be monitored and published on a regular basis with a short descriptive text. Comments were requested on the above and on four specific questions.⁵

⁴ Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code: SEM Committee Proposed Position Paper and Request for Further Comment, 2nd September 2010, SEM-10-060

⁵ Please refer to section 5, page 10 of the consultation paper (SEM-11-002).

2.2 Responses to Consultation

RESPONSES TO CONSULTATION

Ongoing monitoring of the divergence of the market schedule from the dispatch.

Respondents to this consultation generally supported the proposal to monitor and report, on an ongoing basis, on the divergence of the market schedule from the dispatch. Among the reasons stated for this were the effects of increasing levels of wind generation, increased interconnection and the introduction of intra day trading and the ongoing need to minimise the cost of energy to consumers. One respondent noted that among the adverse consequences of divergence is the fact that, at times of high wind, the actual system carbon intensity is far higher than the 'scheduled carbon intensity' due to mainly fossil fuelled plant being constrained on to provide the reserve/support services. Several respondents asserted that the assessment of the impact of this divergence should not be limited to the impact on consumers, saying that this was too narrow a focus. They felt that the impact on generators needed to be taken into account as this would ultimately affect consumers via security of supply and long term increases in costs e.g. if financing costs rose.

The use of a threshold/test level to trigger market changes.

Respondents generally opposed the potential use of a threshold level for material harm to consumers alone and as an automatic trigger to change market rules as this would increase uncertainty and regulatory risk and therefore the ability to access and cost of financing. One respondent specifically noted that this may have a large adverse impact on the viability of existing and future wind projects. Rather respondents agree that a combination of metrics should be used to trigger further analysis rather than to trigger specific market changes. In most cases this is because the respondents believe that drivers for divergence are numerous, complex and interrelated and that any changes need to be considered in a holistic manner, in close consultation with the market and as part of a strategic approach to market development taking into account external factors such as long term trends in fuel prices and finance markets. This should all be considered in the context of the aspiration to promote more liquid and efficient trade between the SEM and neighbouring markets and plans for European electricity market integration. In particular they need to take into account other policy areas such as locational signals and demand response and other payments streams such as Ancillary Services and capacity payments.

Several respondents stated that the use of a threshold level of divergence to trigger market changes would not constitute a proportionate response. Several other respondents were of the view that such a test is not required or appropriate as the existing market design is internally consistent i.e. that no changes to it are or will be necessary or appropriate. Another respondent noted that any proposed changes should not in themselves introduce additional material harm. Several respondents suggested that any threshold, if used, should be a tolerance band and should be used to track the long term trend as it was this rather than an instantaneous level which is important.

With respect to the need for a joined up approach to policy making, three respondents commented on the possibility of conflict in the SEMC position between proposals here and proposals for TLAFs.

Alternatives to the use of a threshold/test to trigger market change.

Respondents generally agreed that rather than being used as a trigger for market changes, the appropriate use of the monitoring of divergence is to identify the drivers of divergence/constraint as a basis for taking action to manage and minimise these. The key role of the TSOs and TOs in this and the need to incentivise them in this respect was strongly emphasised by nearly all respondents. In particular one pointed out that rather than simply monitoring divergence, solutions must be identified and implemented rapidly to ensure that renewable targets can be achieved without deteriorations in system stability or negative impacts on consumers and emphasised the role of storage in managing divergence/constraints.

The need to focus on the drivers of divergence/constraints.

Again respondents generally agreed that there was a need to focus on the drivers of divergence/constraints. One respondent placed a strong emphasis on the need for the establishment of a Grid25 Committee and another suggested the use of deemed firm access as an appropriate incentive mechanism. Another emphasised that the number and timing of renewables projects connecting to the system and operating in the market should be considered when assessing the causes of divergence.

The important role of ancillary services and grid code compliance in the overall management of constraints was emphasised.

A common theme was the need for transparency around dispatch. Most respondents believe that the level and causes of constraints should be published in detail and frequently and some that there should be detailed reporting of causes of divergences on an individual generator basis. One proposed that the TSOs should provide more frequent publication of transmission constraint groups (TCGs) and quarterly publication of constraints reports each within one month of the end of the quarter.

TSO Incentivisation

A recurring theme is that the main remedy is to ensure that the TSOs operate the system efficiently and effectively. For example one respondent asserted that the existing framework already provides a clear separation of market issues and TSO issues (which should be the subject of incentivisation) and provides tools for the regulatory authorities to drive efficiencies and reduce costs to the consumers. Another respondent stated that "The most appropriate route to reducing constraints would be to appropriately incentivise the TSOs to reduce constraint costs, as in other markets, notably in BETTA." One suggested that an appropriate use of the divergence monitoring would be a specific incentive/penalty based on divergence.

The need to discriminate between the drivers of divergence/constraints which are an inherent part of the SEM HLD and those which are due to other factors.

In terms of interpreting the results of any monitoring of divergence a number of participants emphasised the need to discriminate between the drivers of divergence/constraints which

are an inherent part of the SEM HLD and those which are due to other factors. The duration of transmission constraints was alluded to by several respondents who asserted that temporary network constraints do not justify modifications to enduring rules or that medium term constraints may be acceptable.

Comments/assumptions about specific proposals for market change and timing.

Some respondents noted that the SEM Committee has not said what the market changes would be and when they would happen. In general respondents seem to have assumed that the most likely market changes would be around the treatment of generation in transmission constrained areas and the options, which have been discussed at some length in previous consultations, for limiting the access to the market schedule for plant in such areas to the MEC of the constrained lines. Most comments were therefore about the treatment of constraints. The options putting a limit on the amount of price taking generation accessing the market schedule were commented upon less.

Several respondents noted the need for any proposed change to market rules to be proportionate.

Areas of Consumer Impact

Several respondents commented on the broad areas for assessing consumer impact chosen by the SEM Committee. One respondent pointed out that of the 'plethora' of metrics suggested in section 3, only those relating to constraints are chosen in section 4 and felt that this would not fully reflect how well the market structure fits the market environment. One supplier explicitly agreed with the focus on economic impact assessment with more general consideration to long term security of supply and environmental indicators. However, another felt that while it was appropriate to have the focus on economic measures, that when carrying out and publishing assessment the other SoS and environmental indicators tracked elsewhere should be included to give the full picture. One respondent who agreed with the measures proposed nonetheless stated that the consumer focus alone was too narrow in that increased generator costs will in general increase consumer costs.

Economic Impacts

One respondent suggested that the SMP/constraint/system costs approach too narrow and suggested that a range of other factors that could be used. "Any assessment of adverse impact needs to consider whether overall market outcomes are efficient, not whether prices are higher or lower."

Security of Supply Impacts

One respondent broadly concurs and emphasises that the removal of IMR from SEM generator compensation may discourage new entry and increase financing costs for existing participants while another felt that impact on security of supply is not captured simply by measuring the IMRs earned by individual plant in specific geographic areas. The respondent feels that to properly assess the impact on security of supply, factors such as reserve and AS provisions, loss of load and ability of available capacity and the system to meet demand should also be taken into account.

3 SEM Committee Decision

The SEM Committee has considered the responses received to the consultation paper and notes at the outset the need to comply with the EU target model and the recent publication by the Committee of a PID in that regard.⁶ This is a key issue facing the SEM in the medium term along with the continued integration of increasing renewables and EU requirements in that regard.

The SEM Committee recognises that there are a range of potential drivers of any further divergence between the Market Schedule and actual dispatch including, but not limited to, delay in the delivery of network and the scale of curtailment of generation for operational reasons. The TSOs have undertaken several major studies over the past few years to determine the extent and main drivers of curtailment and have recently initiated their SPS project to address these. Furthermore, the SEM Committee has recently consulted on and will consider putting in place measures to incentivise the TSOs to minimise constraints, including curtailment.

The Committee also accepts that the application of a strict “trigger” approach may, on its own, be too blunt an instrument and too narrow in its focus given the potential impacts of changes to the SEM.

- With the above in mind the SEM Committee has reached decisions regarding the on going monitoring of the market with a view to further analysis and reporting to industry. The SEM Committee will monitor the four constraint metrics proposed in the consultation paper along with reporting on the levels of curtailment that occur within the market. These metrics are described in more detail in **Appendix 1**. The SEM Committee will publish the above on an at least annual basis setting out the findings of the monitoring for the relevant period, the trends and indications of possible drivers for the changes/trends in each metric.
- The above publication will include a statement from the SEM Committee regarding whether it considers that further analysis is necessitated given the findings of this limited monitoring.
- If any further analysis is required it will be holistic and will take due account of the wider context and key external drivers such as requirements regarding EU target model compliance and requirements in relation to renewables.

⁶ Please see SEM Committee SEM Market Integration Project Initiation document, 8th August 2011, SEM-11-069

APPENDIX 1 DESCRIPTION OF METRICS TO BE USED FOR ASSESSING IMPACT OF THE DIVERGENCE OF THE MARKET SCHEDULE FROM DISPATCH ON CONSUMERS

The measures of divergence/impact on consumers consulted upon and decided upon for the initial impact assessment are outlined below. All the variables employed in each equation are defined in the Trade and Settlement Code and are publicly available on SEMO website (<http://www.sem-o.com/marketdata>):

1. Constraint payments

A Constraint Payment is made to a Generator when its Dispatch Production Cost differs from its Schedule Production Cost. Where a generator is constrained off such that its Dispatch Quantity is lower than its Market Schedule Quantity, it will receive energy payments for its Market Schedule Quantity and will pay back to the MO a Constraint Off Payment, based on the saving in cost between the dispatch quantity and the market schedule quantity.

The total additional costs to the market of such constraints can be calculated using publicly available data from SEMO.

The Constraint Payment (CP_y) will be calculated as follows:

$$CP_y = \sum_{uh}^y CONP_{uh}$$

Where

- $CONP_{uh}$ is the Constraint Payment payable to Generator Unit u for Trading Period h .
- \sum_{uh}^y is the sum of all Generating Unities, u , in all trading periods in the year y

2. Proportion of energy payment attributable to constraints

As well as looking at the absolute level of constraint payments, it may also be useful to identify the impact on any deviation from the market schedule as a proportion of the total energy cost paid by consumers. This will look at constraints as a percentage of overall wholesale energy payments.

Total suppliers costs are the cost to all suppliers of purchasing electricity at the trading point, which is subsequently passed on customers in NI and ROI i.e. it is the total energy cost (market schedule only) which will have to be paid for by end users.

The Proportion of Energy Payment Attributable to Constraints (PEPAC) will be determined by the following formula:

$$PEPAC_y = \frac{\sum_{uh}^y CONP_{uh}}{\sum_{uh}^y (MSQ_{uh} * SMP)_h}$$

Where

- CONP_{uh} is the Constraint Payment payable to Generator Unit u for Trading Period h;
- MSQ_{uh} is the Market Schedule Quantity for Generator Unit u in Trading Period h;
- SMP_h is the System Marginal Price in Trading Period h.
- \sum_{uh}^y is the sum of all Generating Unities, u, in all trading periods in the year y

3. Infra marginal rents earned as a result of being constrained off

When a generator is constrained off it will pay back to the MO the savings in cost between the dispatch quantity and the market schedule quantity. In this case, it retains any difference between the SMP and the costs which would have been incurred to deliver its Market Schedule (Referred to as Infra-marginal rent)

This performance indicator therefore represents an indication of how the market rewards generation that is not run as well as showing the effect of divergence from the market schedule

$$IMR_y = \sum_{uh-CTO}^y [(MSQ_{uh} * SMP_h) - (GenCosts_{uh} + StartupCosts)]$$

Where

- MSQ_{uh} is the Market Schedule Quantity for Generator Unit u in Trading Period h;
- SMP_h is the System Marginal Price in Trading Period h.
- Generation and Start up costs can not be easily defined by an equation. These variables are derived from the Generators Commercial and Technical offers which are published on SEMO website as all the other variables used in this paper (<http://www.sem-o.com/marketdata>):
- \sum_{uh-CTO}^y is the sum of all Generating Unities, u, in all trading periods in the year y which are constrained off in the period h.

4. Constrained Running by Volume (Divergence)

The volume of constrained on and off running of plant. This will show how energy volumes differ as a result of deviation from the market schedule. The performance indicator would represent the proportion of energy in the market that has been constrained on-or-off to meet demand at the market level.

All data required to calculate this information uses publicly available data from SEMO

The divergence between the market schedule and dispatch schedule reflects the amount of constrained running in the market and has two impacts. First it results in some plant running in constrained on mode i.e. not receiving IMR for its constrained on running. If occurring at significant level over significant periods of time this may have an impact on security of supply. Secondly, it results in some plant being constrained off and receiving infra marginal rents while not contributing to meeting demand.

The Constrained Running by Volume (CRV) variable was determined according to the following formula.

$$CRV_y = \frac{\sum_{uh}^y [\max(MSQ_{uh} - DQ_{uh}, 0) + \max(DQ_{uh} - MSQ_{uh}, 0)]}{\sum_{uh}^y DQ_{uh}}$$

Where

- MSQ_{uh} is the Market Schedule Quantity for Generator Unit u in Trading Period h ;
- DQ_{uh} is the Dispatched Quantity for Generator Unit u in Trading Period h ;
- \sum_{uh}^y is the sum of all Generating Unities, u , in all trading periods in the year y