Single Electricity Market

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

Consultation Paper

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1 INTRODUCTION

In SEM-09-073 'Principles of Dispatch and the Design of the Market Schedule in the Trading & Settlement Code, A Consultation Paper', 8 July 2009, the SEM Committee consulted on, among other things. The following proposals:

> *"The RAs should seek to ensure that the construction of the market schedule is such that infra-marginal rents are allocated to generating units that are of values to the real-time operation of the system and, where deemed appropriate, the RAs will make the necessary changes; "*

and that

> *"The RAs would welcome views on how access to the market schedule for plant situated behind export constraints should be limited, on the options described in Section* **Error! Reference source not found.***. Alternative options are also welcomed."*

The options referred to were as follow:

Option 1: *the market schedule allocates infra-marginal rents to the correct quantity of generation behind each export constraint by modelling export constraints in the market schedule*

Option 2: *the market schedule allocates infra-marginal rents only to generators having firm access quantities*

Option 3: *the market schedule allocates infra-marginal rents first to generators having firm access. In the event this allocation leaves spare capacity on any "export constraint" and there is in-merit non-firm generation behind that boundary, this generation is then included in the market schedule also, up to the limit of the export constraint*

In considering the responses to this consultation the SEM Committee stated, at its meeting in April 2010, that it had not been demonstrated to it that there was any 'material level of harm' to consumers as a result of the current market rules, and that therefore it was not yet convinced of the need to change these. The SEM Committee published a Proposed Position Paper in September 2010 "Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code" (SEM-10-060), in which it stated that, as regards the principle underlying construction of the market schedule

"The SEM Committee is progressing an assessment framework which will evaluate the material harm to customers which could potentially arise in the future as a consequence of the degree of alignment between dispatch and the market schedule. This framework will assess material harm to customers against the following key objectives:

- *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.*

The assessment framework will be published for consultation by the end of this year.

If and where the need for change is determined, options for change will be appropriately assessed in accordance with the decision making framework set out previously by the SEM Committee."

and as regards the allocation of IMRs behind constraints

" The SEM Committee are progressing an assessment framework in the context of the above and will publish this by the end of this year. If and where the need for change is determined, options for change will be appropriately assessed in accordance with the decision making framework set out previously by the SEM Committee. In addition, any measure introduced will be assessed to determine that it is proportionate given the issue in hand."

This consultation has recently closed but the current paper lays out the proposed assessment framework which will evaluate the material harm to customers which could potentially arise in the future as a consequence of the degree of alignment between dispatch and the market schedule. The SEM Committee is therefore seeking views on what evidence should be used to evaluate any potential "material level of harm" to consumers which could be caused by mismatch between the market schedule and the actual dispatch in the current SEM design, taking into account the level of intermittent generation, transmission constraints and operational/technical constraints. This requires that the analysis be developed (including identification of data requirements) to assess the drivers and materiality of any adverse impacts; and that a monitoring system be set in place for tracking and reporting these to the SEM Committee and industry.

2 BACKGROUND

The SEM operates on the basis of a pure, unconstrained market schedule i.e the simple stack of generation offered as available starting with the cheapest that is required to meet demand, with the last generator in the stack setting the system marginal price. This is the price paid to all generators in the stack.

The dispatching of plant to meet demand must take into account physical requirements and constraints on the system. This results in actual dispatch of generation deviating from the market schedule.

The current market schedule:

- Takes account of some of the technical characteristics of plant to optimise the market schedule over a 30 hour time horizon
- Is settled ex-post, therefore has 'perfect foresight'
- Ignores short term transmission constraints
- Ignores long term transmission constraints to the extent that non firm plant is included in the market schedule if dispatched
- Ignores technical constraints (fault levels, need for inertia etc)
- Schedules de minimis, autonomous and price taking plant (basically priority dispatch plant) ahead of other plant without reference to a price for them

It does not at present schedule plant that is required to be run for reasons of

- Security constraints
- Reserve constraints
- Long term transmission constraints

While the regulatory authorities in both jurisdictions will be facilitating efficient build of the transmission network, if the constraints on the transmission network increase, if the level of technical constraints increases as the quantity of intermittent generation on the system increases despite the TSOs best efforts, etc, the question arises as to whether the current rules for constructing the market schedule still set a price and allocate infra marginal rents in a way which delivers the best price for consumers and reward generation in a way which correctly incentivises the island's generation needs.

To summarise, the SEMC recognises that there is an inbuilt difference between physical dispatch and the market schedule for a number of reasons under the High-Level Design and the current market rules. But this does not mean that change to the SEM cannot be contemplated in the face of material changes which would impact negatively on the ability to achieve the SEM objectives. However, the SEMC would note that any such changes will be considered in the context of the overall strategic direction of the SEM, and that any changes will be proportionate.

3 IDENTIFICATION OF POTENTIAL MEASURES FOR 'IMPACT ON CONSUMERS'

As set out in "Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code" (SEM-10-060) the SEM Committee considers that the assessment of the impact of divergence on consumers will be measured against the following key objectives:

1. Economic
2. Security of supply
3. Environmental (i.e. sustainability and facilitation of renewable targets)

In order to be able to monitor and report on any adverse impact of divergence of the market schedule from dispatch a number of potential market performance indicators in each category have been identified:

1 Economic impact on the consumer can result from:
   a. Increases in SMP
   b. Increases in constraints costs
   c. Increases in other costs such as market system developments

2 The impact on security of supply can be identified through:
   a. Loss of load expectation (LOLE)
   b. Specific risk of station closures
   c. Other possibilities related to Grid Code compliance, AS provision, Capacity Margin, Alerts and Load Shedding e.g. non delivery of services when called/tested; adequacy of reserves; capacity margin; number of amber and red alerts; load shedding incidents increased frequency etc.

3 Environmental impact (including sustainability and facilitation of renewable targets) can be measured through:
   a. CO2 emissions
   b. Running hours of renewable generators (as a percentage of national targets)
   c. Roll out of renewables projects

In order to select the most appropriate or key market performance indicators we further evaluate each of the three categories.

3.1 Economic Impact

The SEM design is based on a pricing mechanism which gives an efficient market price. This represents the best balance between the consumers' short term interest (i.e. low price) and long term interest (i.e. incentivisation of adequate quantities of efficient generation). Therefore the consumers' interests are best served by ensuring that this mechanism functions properly. The direct financial impacts on the consumer resulting from the divorce from this efficient process are important. This can be identified by looking at the proportion of wholesale costs that are made up of constraints costs as well as the direct cost of market system developments. Other factors such as the fraction of demand met by non price makers and the frequency of PCAP and PFLOOR events could indicate that the central pricing algorithm may be becoming stretched beyond its ability to set an efficient price.

3.2 Security of Supply

The measures of security of supply are important but are influenced by many factors. In order to determine the extent to which the divergence of the market schedule and dispatch may play a role in security of supply we need to look at the impact on generators.

Generators gaining access to the market schedule receive infra marginal rent whether or not they run. Conversely, generators who do not appear in the market schedule receive only their short run costs (offer price) if they run (are constrained on). The potential impact on security of supply, therefore, is that generators (individuals, classes or in specific geographical areas) who are essential for system security e.g. for the provision of reserve, security or balancing when transmission constraints are operating, may not receive adequate income from the market to guarantee their continued participation. On the other hand efficient plant appearing in the market schedule and receiving infra marginal rents (IMR), if constrained off, is not able to contribute to meeting demand.

Therefore in order to be able to monitor the likely impact of these effects on security of supply the direct impact on generators must be tracked. The parameters most likely to reflect this are the IMRs earned by plant on an individual basis and by plant type and geographical area, as the latter reflects grid constraints.

In addition to IMR, constrained on or off running hours can provide an indication of the variation between dispatch and scheduled generation.

3.3 Environmental impact

There are a number of potential indicators that could be used to assess the environmental impact:

CO2 emissions are currently captured in participants bidding and can change as a result of a divergence between the market schedule and dispatch. Given that any increase in CO2 emissions is captured in cost it would not be appropriate to use this as a key indicator.

Other factors such as total renewable generation and rollout of renewables projects can be impacted by externalities and as such would make it difficult to attribute changes directly to the market mechanism, for this reason these measures are not considered to directly impact the divergence of the market schedule from dispatch.

3.4 Summary

As discussed above, there are a number of possible different criteria that could be chosen to monitor the impact of the divergence between the market schedule and dispatch. However, to ensure a practical framework for doing so, it is necessary to reduce these criteria to a relatively small number of measurable parameters that capture the essence of this divergence.

4 RECOMMENDATIONS

4.1 Recommended Parameters

It is recommended that the following key performance indicators be monitored and reported on regularly with a view to identifying divergence between the market schedule and dispatch and fall into two main categories – cost and volume:

1. Constraint payments

- Constraint payments are those payments paid out for being constrained on (generators recover their costs when this occurs) or constrained off (generators retain infra-marginal rents that they would have earned through the market schedule), both of which are an additional cost resulting from a deviation between the market schedule and dispatch.
- The total additional costs to the market of such constraints can be calculated using publicly available data from SEMO, and can be complied and submitted to the SEMC.

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.
- Data required to calculate this information uses publicly available data from SEMO.

3. Infra marginal rents earned through constraints payments

- This refers to the infra marginal rents earned as a result of being constrained off. It is proposed that this is represented as a percentage of total infra marginal rents earned in the market.
- 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
- Again, all data required to calculate this information uses publicly available data from SEMO

4. Constrained Running

- 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

It is suggested that these key performance indicators should be used to increase transparency to all stakeholders and inform regulators as to where there is potential for an adverse impact on consumers through the performance of the market.

The other measures such as generator profits, environmental indicators, the cost of market system developments and security of supply which are all tracked elsewhere will continue to be considered by the SEM Committee in the wider context, and as required, given the outcome of the monitoring of the parameters listed.

4.2 Assessment and Monitoring

The above metrics are considered a useful set of parameters for assessing the impact of any divergence between the market schedule and dispatch. The SEMC invites views, as outlined below, as to whether these constitute the appropriate parameters to use. In the event that they are ultimately adopted by the SEMC, it is envisaged that they would be calculated by the regulatory authorities and published on a regular basis along with a short descriptive report.

The SEMC is not at this point suggesting a specific set of trigger thresholds that would indicate a material level of harm has been reached. However, it is interested in any views that respondents might have on this issue and will consider them fully in the context of any final decision.

5 CONSULTATION QUESTIONS AND NEXT STEPS

Interested parties are invited to respond to the proposed approach laid out in this paper. Comments are welcome on any aspect. In particular the SEM Committee would welcome views on

1. Does the respondent agree with the SEMC's proposal that, to the extent that it impacts on consumers, the divergence of the market schedule from dispatch needs to be kept under review?
2. Does the respondent agree with the choice of the four key performance indicators? If not, what alternate indicators might be used instead?
3. How frequently, and in how much detail, do respondents believe the indicators should be reported upon?
4. What threshold level of the various indicators should be used as suggesting that a material level of harm has been reached? Should such a threshold be a "once-off" level, or should it be assessed as a level being met for a continuous period of time?

Responses are invited, to be returned by email no later than 17.00 on 8 March 2011 to

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and to

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The SEM Committee will consider the responses to this consultation at its meeting on 29 March and will issue a decision in April 2011.

In the mean time the SEM Committee will be issuing its decision on its recent Proposed Position Paper "Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code" (SEM-10-060)