



Single Electricity Market

Treatment of Price Taking Generation in Tie Breaks in Dispatch in the Single Electricity Market and Associated Issues

Consultation Paper

26th August 2011

SEM – 11 – 063

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1 Introduction

1.1 Background

Following the publication by the Single Electricity Market (SEM) Committee of a discussion paper on the potential challenges associated with increasing penetration of renewable generation, specifically wind, in the all island system early in 2008, the SEM Committee proceeded to issue a consultation paper and proposed position paper on relevant matters in July 2009 and September 2010 respectively.¹ The SEM Committee has now published a decision paper setting out its final decisions on issues addressed in the above papers. Two matters have not been fully decided upon, namely, the treatment of priority dispatch, price taking generation units in tie break situations in dispatch and the associated question of the method to be employed to reduce down MSQs of Price Takers in the Market Schedule under the Trading and Settlement Code (TSC) in Excess Generation Events (EGEs).² This document further consults on relevant aspects of the above two issues.

1.2 Related Documents

- Wind Generation in the SEM: Policy for Large Scale, Intermittent, Non-Diverse Generation, Discussion Paper, 11th February 2008, [SEM/08/002](#)
- Wind Generation in the SEM: Policy for Large Scale, Intermittent, Non-Diverse Generation, Initial Response to Comments and Next Steps. SEM-08-127, 28th September 2008, [SEM-08-127](#)
- Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code, A Consultation Paper, 8th July 2009, [SEM-09-073](#)
- Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code, Proposed Position Paper and Request for Further Comment, 2nd September 2010, [SEM-10-060](#)
- Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code, Decision Paper, 26th August 2011, SEM-11-062

1.3 Responses to this Consultation

Comments are requested from interested parties on the matters raised in this paper, specifically the SEM Committee proposals. Comments on this paper should be submitted by **5pm Friday, 23rd September, 2011**, preferably in electronic format, to Paul Brandon in the Commission for Energy Regulation (the CER) (pbrandon@cer.ie).

¹ SEM-08-002, SEM-09-073 and SEM-10-060

² SEM-11-062

Please note that the Regulatory Authorities intend to publish all responses. Therefore, confidential responses should be clearly marked as such and where possible placed in a separate annex to the response.

For further information on the issues set out in this paper please contact:

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2 SEM Committee Proposals

2.1 Introduction

In SEM-09-073 the SEM Committee consulted on a number of issues, including how price taking generation units that qualify for priority dispatch are treated in dispatch in the SEM. This included consultation on the overall approach to this issue, specifically whether cost could be factored into dispatch decisions regarding such plant and if so to what degree. It also included the question of treatment of hybrid plant in this context and the issue of how tie breaks in dispatch should be resolved for priority dispatch units. Finally, the related issue of the quantity of generation charged PFloor in an Excess Generation Event (EGE) under the TSC was examined. Further information on the above can be viewed in sections 4.8, 4.9, 4.13 and 4.12 of SEM-09-073.

After consideration of response to SEM-09-073 the SEM Committee published proposed decisions in SEM-10-060 on the above issues. In relation to tie breaks in dispatch it was proposed that, *ceteris paribus*, where tie break rules are required post application of the proposed principles regarding treatment of price taking priority dispatch plant in dispatch, including application of the proposed hierarchy set out in that paper in this regard, de-loading should be instructed on a pro rata basis in a manner determined by the TSOs.³ The SEM Committee requested further comment from interested parties regarding the above. This was in the context of the potential for this approach to impact negatively on the ability of renewable generators to finance their activities which would, in turn, ultimately threaten the progressive realisation of renewables targets.⁴

The SEM Committee also proposed that the quantity of generation charged PFloor in the event of an EGE under the TSC arising from an excess of price taking generation should not exceed system demand. In such cases the Market Scheduled Quantities (MSQs) of price taking generation should be pro-rated down so that the total quantity is equal to system demand. Part of the reasoning for this proposed position was that it was consistent with the proposed approach to dispatching down of price taking generation in tie breaks.⁵

The SEM Committee has now reached decisions regarding the overall treatment of price taking priority dispatch plant. This includes a decision on the priority dispatch hierarchy as proposed by the TSOs in this context where relevant choices present themselves in dispatch situations. The SEM Committee has also reached a decision regarding the quantity of generation charged PFLOOR in an EGE arising from an excess of price taking generation. Readers are advised to review these decisions when reviewing the matters being consulted upon below.⁶

³ Please refer to section 5.4 of SEM-10-060.

⁴ Further discussion on this is set out in section 5.9 of SEM-10-060.

⁵ Please refer to section 5.11 of SEM-10-060.

⁶ Please refer to section 4.4 and 4.11. of SEM-11-062

2.2 SEM Committee's Proposals

The SEM Committee, having considered responses received to SEM-10-060, sets out below proposals in relation to the treatment of tie breaks regarding price taking priority dispatch generation units in dispatch post application of the principles set out in section 4.4 of SEM-11-062. It also sets out proposals regarding the related issue of the approach to the reduction of the MSQs of price taking plants in EGEs under the TSCs to meet system demand.

2.2.1 Tie Breaks in Dispatch

2.2.1.1 Background

The SEM Committee has now determined that the principle of priority dispatch is limited by requirements relating to the maintenance of the reliability and safety of the grid and the secure operation of the electricity system with cost considerations not factoring into relevant dispatch decisions in principle. Those units afforded mandatory priority dispatch in legislation must be given priority over those afforded discretionary priority dispatch in legislation and the hierarchy set out in section 4.4 of SEM-11-062 will be employed by the TSOs in dispatch decision making processes. This hierarchy will be reviewed when appropriate.⁷ Priority dispatch is facilitated in the SEM via the price taking mechanism under the TSC. The SEM Committee also determined in the above paper that the issue of tie breaks in dispatch for price taking generation merited further consultation in the context of comments received to the proposed position paper (please refer to section 4.9 of SEM-11-062).

2.2.1.2 Feasibility of Approach to Implementation in Dispatch

The Regulatory Authorities have discussed feasibility issues regarding implementing approaches to tie breaks for price taking generators in dispatch with the TSOs. An overview of what has been advised as implementable in the control centres without requiring upgrades to their dispatch systems and associated costs and time to implement is provided below.

Essentially, differing approaches to dispatch of both constraints and curtailment of wind can be implemented if desired.

For constraints, a maximum of three constraint groups can be modelled on the island with two in Ireland and one in Northern Ireland proposed that represent the most significant constraints for wind generators at present. These form the 'constraints list'. Up to three categories in each jurisdiction can be used to then determine an order for dispatching down where required to address these constraints. Note that it is not possible to issue a dispatch instruction to part of a Controllable Wind Farm Power Station (Controllable WFPS). This means that it is not possible for a project connected behind a single connection point to be split between such categories such that the 'firm' portion of the project (based on FAQ) is in one category with the 'non firm' portion in another. For those constraints that are not

⁷ Please refer to section 4.4 of SEM-11-062.

modelled in the constraints list the TSOs have advised that they would use an approach that best serves to alleviate the constraint in question at least cost, thereby minimising the level of dispatching down of generation.

For curtailment, up to three categories in each jurisdiction can be used to determine an order for dispatching down where required to address these constraints.⁸ As with the case of constraints, it is not possible to issue a dispatch instruction to part of a Controllable WFPS. This means that it is not possible for a project connected behind a single connection point to be split between such categories such that the 'firm' portion of the project (based on FAQ) is in one category with the 'non firm' portion in another.⁹

2.2.1.3 SEM Committee Proposal

2.2.1.3.1 Introduction

Having further considered the above, and responses to the proposed position paper,¹⁰ the SEM Committee considers that, on balance, there is merit in providing for an approach that seeks to give appropriate recognition to the connection processes that exist in the SEM regarding renewable generation. This is insofar as this will assist in the delivery of renewable projects and, therefore, delivery of renewable targets in Ireland and Northern Ireland. The need to provide for appropriate regulatory consistency is also considered important in this context. The SEM Committee notes that connection processes and associated issuance of Firm Access Quantities (FAQs) - centre around the ability of the network to take the Maximum Export Capacity (MEC) of a given generation unit under normal, defined conditions and hence relate to constraints.¹¹ Curtailment is associated with the operation of variable (wind) generation and with cases where there is too much generation relative to demand.

In putting in place principles regarding tie breaks in dispatch due regard should be given to the above. Any solution must be proportionate and feasible to implement in a short timeline to facilitate TSO decision making. It should also be amenable to modelling to a reasonably accurate degree to facilitate investor decision making noting that modelling is by definition never a precise indicator of potential outcomes being modelled. It must also be compatible with timelines for real time decision making within the control centres.

The SEM Committee notes the advice received from the TSOs, based on best available information at the time, that the issue of tie breaks where choices can be made between price taking generators will, in all probability, be more significant for price taking wind generation units in relation to both constraints and curtailment for the next five years. It is

⁸ The TSOs have advised that even with upgrades to their systems, there is a limit on the number of constraint groups in the constraint list and the number of categories of generation units that can be accommodated.

⁹ Note that a wind farm can be split in this context once each part of the windfarm arising from the split is separately dispatchable and is compliant with the relevant Grid Code. This applies to situations of curtailment and/or constraint.

¹⁰ Responses to SEM-10-060 can now be viewed on the All island Project website (<http://www.allislandproject.org/>).

¹¹ FAQs are allocated in an increasing manner periodically over the time period to completion of the necessary network reinforcements in accordance with the SEM High Level Design.

appropriate to keep this under review in the context of network development and the advent of new, non wind price taking generation plant on the all island system.

Given the above, the SEM Committee proposals are set out below.

2.2.1.3.2 SEM Committee Proposals

The approach set out in the bullet points that follow will be implemented post application of the principles set out in section 4.4 of the SEM Committee's decision paper on dispatch and scheduling (SEM-11-062).

- For non wind price taking priority dispatch generation units, where a choice must be made within a given group in the hierarchy set out in section 4.4 of SEM-11-062 then dispatching down will be done on a pro rata basis for both constraining and curtailment within the relevant group (e.g., peat represents one group, with HE CHP/biomass/hydro representing another group, etc.)¹²
- For price taking wind generation, the order set out in section 4.4 of SEM-11-062 will apply such that:
 - wind generation units which should be controllable but which do not provide this service will be dispatched down first;
 - wind generation units which are controllable will be dispatched down next in accordance with the principles set out in the bullets below (bullets A. a) and A. b) re constraints), and
 - wind generation units that are derogated from relevant Grid Code requirements or which are not required to be controllable under those requirements will then be dispatched down where possible. This will include wind generation units that are commissioning for the appropriate duration as agreed with EirGrid. This includes wind generators that are, at the time of publication of this consultation paper, engaging with the relevant TSO in the context of a defined process to move to being controllable and thus compliant with Grid Code requirements. If such generators fail to meet agreements with the relevant TSO under the defined process in the agreed timelines then they will move up the order and be dispatched down first amongst the wind group.
- For price taking priority dispatch controllable wind generation units in tie break situations post application of the principles and hierarchy set out in section 4.4 of SEM-11-062, the following will apply:

¹² Note that, as stated in section 4.4 of SEM-11-062 for non wind price taking generation units dispatching down to minimum load is what is done before moving to the next group in the hierarchy.

A. Constraints

- a) Three constraint groups will be modelled on the island of Ireland for this purpose. These represent those that are most significant for wind generation units. The TSOs have advised that currently these constraints are in the south west of Ireland, the north west of Ireland and the north west of Northern Ireland. These form the 'constraints list'. The approach set out here will only apply to the constraint groups in the constraint list.
- b) Three categories of unit will be used, namely:
 - i. those controllable wind generation units with a FAQ of 66% and above of their MEC under their signed connection agreement;
 - ii. those controllable wind generation units with a FAQ of between 33% and up to 66% (inclusive) of their MEC under their signed connection agreement, and
 - iii. those controllable wind generation units with a FAQ of below 33% and below of their MEC under their signed connection agreement. Note that those with temporary connections or those that have not been allocated FAQs under signed connection agreements will fall into this category for their entire installed capacity up to the MEC that they have applied for in a completed application for connection to the relevant body.

For constraints, dispatching down of controllable wind generation units set out in b) above will be carried out such that those falling into iii. will be dispatched down before those falling into ii. with those falling into i. being dispatched down last.

B. Curtailment

- a) For price taking priority dispatch controllable wind generation units in tie break situations post application of the principles and hierarchy set out in section 4.4 of SEM-11-062, dispatching down to relieve curtailment issues will be done on a pro rata basis on the island of Ireland.
- Where there are both constraints and curtailment issues arising, the TSOs shall first dispatch to manage the constraint issues and then work to address the curtailment issues. This will serve to minimise the dispatching down of wind relative to an approach whereby curtailment issues are first addressed.

- Constraint groups will be reviewed periodically to ensure that those that are most significant in this context are represented in the constraints list (subject at all times to a maximum of three constraint groups within that list for feasibility reasons as advised by the TSOs). This review will take place no more frequently than once per annum.
- For constraints not included in the constraints list the TSOs will dispatch down wind generation units in a manner that best relieves the constraint whilst minimising the dispatching down of wind generation.

The SEM Committee notes the need for approaches to the allocation of FAQs that are compatible with the SEM High Level Design in Ireland and Northern Ireland to facilitate the appropriate operation of the above proposals.

2.2.1.4 Modelling Issues

Regarding modelling for Possible Generator Output Reduction (PGOR) reports in Ireland, EirGrid have advised that the above approach can be modelled to a degree with further work required to define the full approach post receipt of the final principles regarding dispatch from the SEM Committee. They noted in discussions that, as with all modelling, differences between actual outcomes and modelled outcomes will arise. As with modelling for PGORs to date, constraints in Northern Ireland will not be modelled, resulting in over curtailment on the island given that constraints will be addressed before curtailments. The practice to date of assuming that for hours where there is an excess of wind generation this is absorbed by exports and that for all other hours zero imports are assumed will apply. As no firm information is available regarding non compliance with the requirements of the Grid Codes in relation to controllability for the period being modelled, it will be assumed that all wind farms that should be controllable are, with those wind farms that are not required to be controllable under the Grid Codes netted off demand in the model. Importantly, the model also assumes economic dispatch as a general principle and will dispatch down accordingly, including for constraints, only seeing a tie break where there is more than one wind generator that can equally alleviate a given constraint.

EirGrid has advised that, assuming a timeline of January for completion of FAQs for Gates 1 and 2 in the context of CER/10/102 and following the recalculation of Gate 3 FAQs in 2012 in the context of re-optimisation, and also assuming no undue delay regarding SEM Committee decisions on all the principles to apply to price taking priority dispatch plant, it will take approximately nine months to one year to set up their models to reflect the proposed principles and to run the models and issue all constraint reports. EirGrid has been requested to examine this timeline to see if there is scope to reduce it given the impact on timelines for connection offer acceptance by Gate 3 applicants.

2.2.2 Quantity of Price Taking Generation Charged PFloor in an Excess Generation Event (EGE)

2.2.2.1 Background

The question as to which generation units are charged PFloor in an EGE was examined in the 2009 consultation paper (SEM-09-073). Under the current TSC rules in an EGE Variable Price Takers are charged on the maximum of their availability and actual output and, hence, PFloor is charged to more generation units than there is demand. This results in generation units effectively being penalised for being available at times of an EGE. The consultation paper set out a proposal to address this issue (see below). The SEM Committee proposed in that paper that the quantity of generation charged PFloor in the event of an EGE arising from an excess of price taking generation should, in such circumstances, be pro-rated down so that the total quantity is equal to System Demand.

Further to review of responses to that paper the SEM Committee subsequently reiterated its proposed approach in the 2010 proposed position paper (SEM-10-060). In doing so the SEM Committee noted that the proposed pro rating approach was consistent with the proposed approach in that paper to dispatching down of price taking generation in tie breaks. In section 4.11 of SEM-11-062 the SEM Committee determined that the quantity of generation charged PFLOOR in the event of an EGE arising from an excess of price taking generation should not exceed System Demand. In such circumstances, the MSQs of price taking generation should be reduced so that the total quantity is equal to System Demand.

Given the link between this issue and the tie breaks in dispatch issue, the SEM Committee deems it appropriate to further consult on this matter, specifically on the detailed implementation of the above decision and how the MSQs of price taking generation are reduced to equal System Demand.

2.2.2.2 SEM Committee Proposal

The SEM Committee's proposal regarding tie breaks in dispatch are set out in Section 2.2.1 above with associated decisions regarding priority dispatch set out in sections 4.4 and 4.5 of SEM-11-062. Given these proposals, and the SEM Committee's views regarding the degree of divergence between the Market Schedule and dispatch in the SEM as set out in SEM-11-062, the SEM Committee considers that it is appropriate to reflect the proposals regarding dispatch of price taking generation in the approach to the detailed implementation of their decision regarding the quantity of price taking generators that is charged PFloor in an EGE. This will also ensure that parties that are not dispatched in these situations are not charged under the TSC.

The feasibility of implementing the above has been discussed with the SEMO who have advised that it is possible to reflect dispatch outcomes in settlement in cases where it is determined under the TSC that an EGE has occurred. In such cases, the SEMO can put in place a post processing procedure whereby, once the EGE has been determined under the TSC, the resulting MSQs are adjusted ex-post to reflect the Metered Generation of relevant Price Taking units. It is considered that the introduction of this process will not impact on settlement timelines under the TSC and can be done reasonably quickly post a SEM Committee decision on this matter.

For the avoidance of doubt, the above applies to energy payments and charges arising under the TSC.

At time of writing there had been no incident of and EGE under the TSC. However, if the incidence of EGEs were to become relatively frequent then the SEMO has advised of their view that it would be appropriate to automate the above approach.

3 Request for Comment

Comments are requested from interested parties on the matters raised in this paper, specifically the SEM Committee's proposals. Comments on this paper should be submitted, preferably in electronic format, by **5pm Friday, 23rd September, 2011** to:

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