Single Electricity Market Committee

Trading & Settlement Code

I-SEM Policy Parameters & Scheduling and Dispatch Parameters

Consultation Paper

SEM-17-029

12 May 2017

INTRODUCTION

The European Union (EU) is implementing an internal market for electricity which is underpinned by the implementation of the European Electricity Target Model (EU Target Model) arising from the EU's Third Energy Package. The EU Target Model is a set of harmonised arrangements for the cross-border trading of wholesale energy and balancing services across EU Member States. In order to take advantage of the opportunities offered by these cross-border trading arrangements the SEM trading arrangements are being changed. There is no fixed model for the pan-European electricity market, and the planned changes are aligned to the particular circumstances and needs of both jurisdictions while meeting the guidelines under which the EU Target Model operates. It is within this context that the SEM Committee committed to implementing the Integrated Single Electricity Market (I-SEM).

The process of developing the I-SEM began in July 2011 when the SEM Committee requested that the Regulatory Authorities (RAs) lead a team for the market integration project involving the TSOs and the SEMO. Central to this has been the development of the I-SEM Trading and Settlement Code (TSC) which will be given effect on 23 May 2017, 12 months before I-SEM Go-Live, scheduled for 23 May 2018, and replacing the current Single Electricity Market (SEM) arrangements when it does so. The process of developing the I-SEM Trading arrangements, through amending the TSC, has been both lengthy and comprehensive.

In parallel to the work on the amendments to the TSC, work has been progressing by the TSOs in developing their approach to the scheduling and dispatch of the system. As part of this work, the TSOs took into account aspects of the ETA Detailed Design Decision (SEM-15-065) relating to the scheduling and dispatch process. A key area in the decision related to the parallel opening of the intraday and balancing market, and the importance of reducing the impact of TSO actions on ex ante markets. This work has manifested itself in Licence changes, Grid Code changes and the introduction of new parameters to the scheduling and dispatch tools (consulted upon here).

The parameters consulted upon in this consultation process arise from both the finalisation of the revised Trading and Settlement Code, set out in SEM-17-024ken, and the publication of EirGrid and SONI's TSO licences in March 2017.

The first consultation covered parameters that related to imbalance settlement and a wide range of parameters used in the calculation of Participants' required credit cover.

This consultation is the second of two consultations on the setting of I-SEM Trading and Settlement Code (TSC) market parameters. This consultation covers parameters utilised in:

1) the calculation of the imbalance price;

2) the scheduling and dispatch process; and
3) the contract refusal process.

The approach to the parameter setting consultation process was provided to the Energy Trading Arrangements Market Rules Working Groups, both in a paper to the Working Group in July 2016 and in presentations made to the Working Group in October and December that year. This set out the parameters to be consulted on, the assessment methodologies that would be employed, and updates on the timescales and process as it evolved. As provided to the Market Rules Working Group, the assessment of parameter values and proposals for their initial setting in I-SEM have been primarily led by SEMO as:

(a) the parameters-setting process is a direct continuation of the TSC development process; and,
(b) the necessary technical and market information resides with SEMO.

The SEM Committee recognises the importance of the initial setting of the market parameters, and also notes the significant work that has been undertaken by the TSOs and SEMO in producing the attached reports.

This consultation also includes a number of parameters that are set by the RAs from time-to-time. These parameters differ from the other parameters in this consultation, and those in the first tranche of parameters, as they are not based on proposals from SEMO, or in the case of the scheduling and dispatch parameters, the TSOs, but are instead directly consulted on by the RAs.

The remainder of this paper contains a short summary of the parameters considered in the reports from SEMO and TSOs. This paper also includes proposals in relation to three parameters set by the Regulatory Authorities – Price Cap and Price Floor, and the 'Response Period Duration' parameter used in the contract refusal process in Section G.12.3 of Part B of the Trading and Settlement Code.

The SEM Committee invites comment on the proposals set out in this paper and the attachments to this paper.

Comments should be sent, preferably in electronic form, to both:

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All comments received will be provided to SEMO or the TSOs as appropriate and may be published unless the respondent clearly indicates that the relevant comment is confidential.

All comments should be received by close of business on **Friday, 9 June 2017**. A final decision on the parameters consulted upon in this paper is due to be published in early July.

1. PARAMETERS FOR THE DETERMINATION OF THE IMBALANCE PRICE

Under section E.2.1 of Part B of the Trading and Settlement Code (TSC), SEMO is required to report to the Regulatory Authorities proposing parameters to be used in the calculation of Imbalance Prices, as required from time to time when requested by the Regulatory Authorities. Further, under Section B.19.3.1 of the Code, SEMO is required to report to the Regulatory Authorities proposing parameters to be used in determining the occurrence of resettlement and repricing. The accompanying SEMO document [SEM-017-029a] sets out the methodologies the SEMO has used in determining their proposals for the following parameters considered under section E.2.1 and B.19.3.1 of the Code:

- De Minimis Acceptance Threshold;
- Price Average Reference Quantity; and,
- Pricing Materiality Threshold

The De Minimis Acceptance Threshold (DMAT) is a component of the imbalance pricing methodology and is intended to prevent small volumes from influencing the price. Under the TSC, every Accepted Offer and Accepted Bid, with a quantity (QAO or QAB) whose absolute value is less than the DMAT value is excluded from the ranked set of offers and bids which is used to set the Imbalance Price for an Imbalance Pricing Period before the flagging and tagging process is applied. SEMO proposes a value of DMAT 0.4MWh over an Imbalance Pricing Period (five minutes), or 2.4MWh on an Imbalance Settlement Period (30 minutes). This, SEMO consider, strikes a balance between excluding 'unintended' actions generated by the scheduling and dispatch tools, while capturing deliberate actions by the TSOs. This value was recommended by SEMO after consideration of the average ramping of existing units over a five minute period.

The Price Average Reference Quantity (QPAR) is a parameter that determines the MWh quantity of actions that are averaged when calculating the imbalance price. In SEM-15-065, the SEM Committee decided that consideration should be given as to whether imbalance prices should be set on a volume-average of a specified number of MWhs rather than the cost of the marginal energy balancing action. This "PAR" averaging has been a feature of the BETTA/NETA market for some time, although GB is moving away from an explicit averaging approach to marginal pricing, "PAR 1", which will take effect in 2018. The SEM Committee was clear in its decision on Imbalance Pricing in SEM-15-065 that a number of imbalance pricing parameters will determine the level and volatility of outturn imbalance prices. The price profile will also be determined by the specific approach taken to the flagging and tagging of non-energy action. The SEM Committee's view in SEM-15-065 was that consideration of explicit price averaging should be undertaken in the context of these other, price affecting parameters. The SEM Committee noted that any explicit averaging should not distort incentives to trade ex-ante. Consequently, it stated that any explicit averaging should be both evidence-based and time limited, if any QPAR value other that 1MWh is adopted.

Having considered the impact of a range of values for QPAR, SEMO recommends in its report using a QPAR of 1MWh as the use of price averaging does not appear to have a discernible impact on the stability of imbalance prices. Further detail of the recommendation is set out in the accompanying Report.

The Price Materiality Threshold arises in the event of a resolution to a pricing dispute. This value dictates whether an imbalance price is recalculated or not in the event of an upheld pricing dispute. SEMO propose a materiality threshold of 15%. The approach used by SEMO to calculating this proposed value was to consider the level of a change in the imbalance price required to lead to a financial impact equal to or greater than the proposed value for the Settlement Recalculation Threshold set out in the SEMO Recommendation Report on Imbalance Settlement Parameters published with SEM-17-009b The SEMO Report notes that as volumes within a specific imbalance settlement period are generally relatively low for any particular participants, the level of the change in the imbalance price required to meet the threshold proposed in SEM-17-009b is met only at a relatively high percentage of change to the imbalance price.

2. SCHEDULING AND DISPATCH PARAMETERS

Under section 10A of the proposed EirGrid Transmission System Operator Licence, and section 22A of the proposed SONI Transmission System Operator Licence, the System Operator (SO) is required to report to the Regulatory Authorities, proposing parameters to be applied in the scheduling and dispatch process. The accompanying paper sets out the methodologies to be used by the TSOs to calculate the following parameters considered under those Licence Conditions, along with recommendations as to their values to apply from Go Live. The parameters covered in the report are:

- Long Notice Adjustment Factor (LNAF);
- the System Imbalance Flattening Factor (SIFF); and,
- the daily time for fixing the System Shortfall Imbalance Index (SSII) and SIFF.

These parameters are proposed as a means of giving effect to the objectives of scheduling and dispatch from the market design decisions, in particular, balancing the trade-off of 'early' energy-balancing actions against the cost of non-energy actions. The two factors, a Long Notice Adjustment Factor (LNAF) and a System Imbalance Flattening Factor (SIFF), apply a weighting to the costs of offline generators to reduce the likelihood of the scheduling tools recommending early commitment actions in the scheduling process. Specifically, the LNAF and SIFF will apply to unit's start-up costs (or, in the case of a Demand Side Unit, to shut down costs) in the scheduling process. The application of these parameters will tend to reduce the likelihood of early unit commitment decisions over greater use of shorter-notice units.

The accompanying paper from the TSOs (SEM-017-029b) sets out the methodology for calculating the LNAF and SIFF (and associated System Shortfall Imbalance Index – SSII) and their application in the scheduling tool. As described in the accompanying report the TSOs have developed a framework for identifying groupings of units with roughly similar notice times and an equivalent €/MWh cost for units within each group (referred to as Notice Time Groups). The methodology developed by the TSOs then models a range of scenarios using a Plexos production costs approach. The TSO report considers the impact of different LNAF values on total production costs, unit starts, and any system security issues that might arise, such as unserved energy, reserves shortages and curtailment. Having considered the range of scenarios produced, the TSOs' recommendation is that the LNAF and SIFF parameters are not applied from Go Live. This recommendation is set out in more detail in the accompanying paper.

The final parameter in this area is the time to set the System Imbalance Flattening Factor. The TSOs propose that this value should be set approximately one hour before the final Long-Term Scheduling run before the beginning of a Trading Day. As the final timings of the scheduling and dispatch process have not yet been finalised, the TSOs are unable to identify a specific time but recommend that the time for fixing the SSII for a Trading Day is between 19:00 TD-1 and 22:00 TD-1,

and at least one hour prior to the start of the final LTS scheduling run. The TSOs state that the exact timing to be advised following the decision on the timing of this LTS run.

The SEM Committee invites comments from participants on the proposals in the TSO paper, in particular the recommendation from the TSOs on the application of the LNAF and SIFF from Go Live.

3. RESPONSE PERIOD DURATION PARAMETER

3.1 Background

Section G.10.3 of Part B of the Trading and Settlement Code relates to the non-acceptance (refusal) of contracted quantities notified to SEMO due to a participant having insufficient credit cover in the event of non-delivery. This process prevents the participant from increasing their potential indebtedness within the Balancing market by executing day-ahead and intra-day sales. Arising from comments received to the TSC Amendments consultation (SEM-16-075), there was a recognition that a 'time to rectify' was required, which would allow a participant an appropriate period of time to address a shortfall of credit before contracts notified on their behalf would be refused.

The TSC Amendments decision (SEM-17-024) includes a separate, shorter process, compared to the standard credit cover increase process, as it was not considered prudent to allow the potential for indebtedness to increase until the participant is expelled from the market. The practical implication of this is that a participant, upon receiving a Required Credit Cover Report from SEMO which requires further collateral to be lodged, will have a period of time to do so, before ex ante market contracts for sale of energy are rejected by SEMO.

The provision for the RAs setting a value for Response Period Duration arises in Section G.10.3 which states, 'The Regulatory Authorities may determine a Response Period Duration from time to time and notify the Market Operator'. The parameter is applied in Section G.12.3.1 of the TSC such that a, Response Period commences when the Required Credit Cover Report containing the Credit Increase Notice is provided to the applicable Participant and expires at the end of a Period equal to the Response Period Duration.

3.2 SEM Committee Proposal

When considering the appropriate Response Period Duration a number of factors need to be taken into account including the number of hours it takes to arrange a transaction with a Participant's bank, the time to trade out of the position, and the time for SEMO to administer any increase in collateral posted by a Participant notified of a credit breach. The Response Period Duration should be a period of time that is useful to the Participant. In other words,

providing a period of time during which a Participant is unable to interact with their bank or access any significant trading opportunities to resolve their credit breach, would not reasonably be considered a 'time to remedy'.

In considering the need for a time to remedy in this context, the SEM Committee was cognisant of the impact of a short term pricing event, such as Administered Scarcity Pricing, would have on Participants' Required Credit Cover as the relevant Credit Assessment Price is set dynamically (G.14.2). Thus, the SEM Committee notes that a Credit Cover Increase Notice may not be the result of any particular action on the part of a Participant. On this basis, the SEM Committee considers that the Response Period Duration should not be in any way punitively short, but can be managed within the normal course of business practice.

In considering this, the SEM Committee has also looked to the case of BETTA where a similar limited time period within the credit process applies in the Balancing and Settlement Code, and notes that this period is five working hours (Section M, paragraph 3.2.2 of the Balancing and Settlement Code).

In formulating its proposal, the SEM Committee has considered the occurrence and period of time between different Credit Assessments. Management of Credit Cover Requirements in AP 9 states that the 'Market Operator will carry out three Credit Assessments each Working Day. These will be carried out at 09:00, 12:00 and 15:30'. As the time it takes SEMO to issue Required Credit Cover Reports to participants is not fixed and may take more time than normal in some circumstances, it is important to clarify that the Response Period can only start once a participant has been notified of their breach by receipt of Credit Cover Increase Notice. This said, for the purpose of developing a proposal for this consultation, the period between the commencement of the assessment and the issuing of the reports is taken to be no more than one hour.

Assuming a five hour Response Period Duration, were a Credit Cover Increase Notice to be issued an hour after the 09:00 Credit Assessment, the Participant could still trade and remain in breach though the 12:00 Credit Assessment but contract refusal would apply after the 15:30 Credit Assessment, the Response Period Duration having been exhausted without remedy at 15:00.

If a Participant was in breach at the 15:30 Credit Assessment, using five elapsed hours after notification of being in breach, the Response Period Duration would end at 21:30. Applying the principle that the time to remedy should be 'useful', the time outside office hours would not be considered to meet that principle. Considering the same five hour duration but apply it on a normal business hour basis, the participant would have one hour from 16:30 to 17:30, and four hours the next working day, from 09:00 to 13:00. Thus, the Participant would have the opportunity to trade through and remain in breach through the first two credit assessments of the day, but would need to have resolved their credit position to continue having contracts accepted on their behalf by SEMO, by 15:30.

In the third and final instance, a Participant found to be in breach in the 12:00 Credit Assessment and notified at approximately 13:00, would have the remainder of the business day and next morning to resolve their position before contract refusal would begin to apply from the 12:00 credit assessment onwards.

On this basis, the SEM Committee considers that five hours is a reasonable period providing Participants the opportunity to either trade out of the credit breach (by buying energy and reducing their potential indebtedness), or to interact with their financial institution to increase their collateral with SEMO.

While consideration has been given to setting the Response Duration Period as a fixed number of Credit Assessments, a specific weakness of this approach is that if there was ever an increase or decrease in the number of credit assessments from that set out in AP9 today (three), it would significantly impact the duration of the period set by the RAs. Setting a value based on working hours (i.e. 09:00 to 17:30) ensures that a reasonable period of time to remedy a situation is provided regardless of changes to AP9.

The SEM Committee proposes that the Response Period Duration be set at five working hours. The SEM Committee invites comment from industry on this proposed value.

4. PCAP AND PFLOOR

4.1 Background

Section D.4.1.1 of the TSC states that the Market Price Cap (PCAP) and the Market Price Floor (PFLOOR) shall have the values determined by the Regulatory Authorities from time to time. While this requirement on the RAs is retained from the Gross Mandatory Pool SEM TSC, there are significant differences between the application of these parameters in the SEM and the I-SEM.

The values of PCAP and PFLOOR have been 1,000 €/MWh and -100 €/MWh since SEM Go Live in 2007. In the SEM, PCAP is a cap on SMP (and bidding), with the overall price (SMP plus capacity rewards) capped by VOLL (Value of Lost Load). In the SEM, PCAP is thus solely an energy price cap. At SEM go-live VOLL was set at 10,000 €/MWh for 2007/08 subject to increases at the rate of inflation (AIP-SEM-07-484). Accordingly in 2017 VOLL was calculated to be 11,047.73 €/MWh (SEM-15-059). However, it should be noted that the rules governing the distribution of capacity rewards in the SEM are such that overall SEM rewards in any given settlement period have not come close to the VOLL level.

In the I-SEM arrangements, PCAP is the overall price cap equivalent to VOLL in the SEM i.e. the rationing price (or maximum price) that customers in aggregate are deemed to be prepared to pay to avoid an interruption in their electricity supply.

PCAP and PFLOOR appear in Part B of the TSC in Chapter E.3.6.3 whereby the Imbalance Price is set to PCAP or PFLOOR if the value calculated in accordance with the Code is outside the 'collar' – i.e. if the imbalance price is higher than PCAP, or is calculated lower than PFLOOR.

In the day ahead and interim intraday auctions, the PCAP and PFLOOR are set by the operators of the EUPHEMIA algorithm. These values are currently set at 3,000 €/MWh and -500 €/MWh. CACM requires these values to be set on EU-wide basis as part of single day-ahead coupling arrangements and are currently under review at an all-Regulatory level. The SEM Committee notes that Article 41 of CACM, on which this process is based, requires the proposal from the NEMOs to the RAs to 'take into account an estimation of the value of lost load'. In the case of the cross-border intraday continuous trading framework (XBID), the PCAP and PFLOOR are currently set at 9,999 €/MWh and -9,999 €/MWh respectively. As with the DAM values, these values are also under review at an EU, all Regulatory Authority level. These same values will apply to the continuous within-zone market in the interim intraday solution proposed for I-SEM Go Live.

Given the different nature of the SEM and I-SEM arrangements, and the significantly higher levels of PCAP and PFLOOR in the ex-ante markets compared to the current levels the SEM Committee consider that the values used in the current market are no longer suitable. The SEM Committee is also cognisant, that decisions in relation to these values are no longer an issue which the SEM Committee can necessarily take in isolation from other EU-wide requirements.

While PCAPs and PFLOORs tend to be considered in conjunction within one another, individually, the two values have distinct rationales and provide different market incentives. On this basis, the two values are discussed separately below.

4.2 PCAP

In setting the appropriate level of PCAP in the Balancing Market, it is important to consider the design of the capacity market and the already determined level of ex-ante price caps.

CRM Decision 2 (SEM-16-022) stated that the value of full Administered Scarcity Price (ASP) that will apply when the necessary conditions have occurred as set out in the TSC, will be set at the EUPHEMIA day ahead price cap of 3,000 €/MWh for a transitional period until 2022/23. After, this transitionary period, ASP will be set at VOLL. Further, the SEM Committee decisions on the CRM have determined that the ASP should be a Balancing Market price floor in the event of a scarcity event, and that the imbalance price could be above the ASP level. These pre-existing decisions suggest that it is necessary to set a PCAP higher than the ASP, at least during the period until 2022/23 that ASP is set below VOLL.

In considering the interaction between the balancing market and the intraday continuous market, it is also important to ensure that the trading signals are not unduly distorted, and in

particular that the setting of the balancing market PCAP maintains incentives on participants to trade into a balanced position through the ex-ante markets.

If PCAP were to be set at below the 9,999 €/MWh cap that will apply to the continuous intra-day trades, say at 5,000 €/MWh, then there would be incentives on participants looking to balance their position to avoiding buying demand in times of scarcity from the IDM continuous on the basis that that demand could be met at the 'capped' BM price, which would become a de-facto intra-day trading cap. On this basis, taking both the design of the capacity market and the alignment of trading incentives across timeframes into account, there would appear to be merit in setting the PCAP to a minimum of the continuous intra-day market i.e. 9,999 €/MWh. This would maintain the incentive to trade ex-ante, which is an important cornerstone of the I-SEM design. However, the SEM Committee notes that the continuous intra-day market price cap is set merely on the basis of the data handling capabilities of a particular trading platform (XBID), and has no underlying economic rationale. Further, this continuous intra-day auction price cap is below VOLL, and thus the level that full ASP is planned to be set at by 2022/23. Setting PCAP at this level, 9,999 €/MWh, could thus only be considered as a transitional step until ASP levels increased towards this level.

Alternatively, PCAP could be set to VOLL, which is the maximum level at which it could rationally be set, and the level to which ASP is planned to increase to. This would maintain the economic rationing price signal within the trading arrangements, rather than setting it at a level that would be somewhat arbitrary (be that the intraday cap of 9,999 €/MWh or a value greater than this, but less than VOLL).

The SEM Committee considers that setting PCAP at VOLL is the choice that is most consistent with the I-SEM design in its application of a rationing price in the Balancing Market, and maintaining incentives to trade ex-ante. The SEM Committee invites comment on the proposal to set PCAP to rationing equivalent to the SEM VoLL i.e. 10,000 €/MWh in 2007/08 subject to inflation consistent with the current methodology (as per AIP-SEM-07-484).

4.3 PFLOOR

The issues noted above related to the setting of PCAP do not have any reverse equivalence when considering the appropriate level of PFLOOR. Indeed, it could be argued that there is no reason to apply a floor, and prices should be allowed to go negative to an unlimited extent.

The SEM Committee notes that discussions at an EU level in light of the publication of the Clean Energy Package, have stressed the importance of ensuring that energy prices can reflect the actual value of energy (up and down) in times of both scarcity and surplus. Negative prices provide behavioural and investment incentives to both generators and demand. The profile of prices at which energy can be consumed and sold provides incentives to invest in storage facilities, as well as providing incentives for demand side management. However, while VOLL provides a maximum rationing price there is no equivalent concept / assessment regarding negative prices. In other words, if VOLL represents the highest price consumers would be willing to pay to avoid disconnection, if a customer is prepared to be paid to consume there is no

obvious limit to how much it would be prepared to be paid to do so. That said, the SEM Committee does not foresee large negative prices sustaining over anything other than the very short term as they provide sharp incentives for generators to reduce output, rather than pay to generate.

The SEM Committee is cognisant of the direction of travel at an EU level of allowing prices to dynamically reflect scarcity and surplus in market-pricing mechanisms, and the EUPHEMIA and intra-day PFLOORs both extend this approach considerably beyond the existing SEM PFLOOR of -100 €/MWh. As noted in the case of PCAP, the SEM Committee considers that Balancing Market prices should not be more constrained than those in ex-ante markets and that there is therefore some rationale for setting PFLOOR at a level outside those bands.

In regard to PCAP, the SEM Committee proposed that VOLL represented an economically rational Balancing Market price cap, but as noted above, there is no clear negative pricing equivalent of VOLL that can be utilised as a floor price. Consequently, the SEM Committee considers that setting PFLOOR at -9,999 €/MWh or slightly above this, is the least distortionary approach between I-SEM markets and is most consistent with EU direction of travel.

The SEM Committee Invites comment on this proposal to set PFLOOR to -10,000 €/MWh

5. NEXT STEPS

Comments should be sent, preferably in electronic form, to both:

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All comments received will be provided to SEMO or the TSOs as appropriate and may be published unless the respondent clearly indicates that the relevant comment is confidential.

All comments should be received by close of business on Friday, 9 June 2017. A final decision on the operational parameters consulted on in this paper is due to be published in early July 2017.