



**Response by Energia to SEM Committee  
Consultation Paper SEM-17-027**

***Proposed Locational Capacity Constraints  
Methodology and Proposed Amendment to the  
Methodology for the Calculation of the Capacity  
Requirement and De-rating Factors***

**16 May 2017**

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## Executive summary

The SEM Committee, in recognition of the significant locational constraints characterising the Irish transmission system, has decided to include locational constraints within the CRM with the view to ensuring the chosen security standard is maintained by procuring sufficient capacity within constrained areas. However, this primary objective, which reflects the Regulatory Authorities' (RAs) statutory objective and duty to protect security of supply, is being unnecessarily frustrated by the following:

- Firstly, the SEM Committee's desire to restrict and simplify the TSO methodology for identifying and quantifying constraints; and
- Secondly, the SEM Committee's highly restrictive bidding controls being implemented in the I-SEM balancing and capacity markets.

As a result of these (self-inflicted) obstacles, the I-SEM's market design, including the CRM, is unlikely to achieve security of supply so that the SEM Committee has suggested that additional intervention, in the form of out-of-market *contracting flexibility* and *targeted contracting mechanisms*, may be required. It is not clear if or how these mechanisms will work or whether they are intended to be included in the CRM State aid notification. Urgent clarity is required in respect of the SEM Committee's intentions in this regard. To the extent that the SEM Committee believes that it may be necessary to rely on any targeted contracting mechanism in addition to the auction mechanism, then this must be notified to the European Commission as part of the CRM and the approach to be used for the purpose of dealing with locational constraints, including for the purpose, if applicable, of confirming that there is no State aid involved.

While the SEM Committee has identified the State aid rules, including the European Commission's State aid Guidelines and the European Commission's sector inquiry into capacity mechanisms, as being an essential consideration to the CRM design, we are concerned that a targeted mechanism may be required to make up for the *money missing* because of the very design of the energy and capacity markets. Energia has set out in response to previous consultations and correspondence the reasons why the proposed controls are inappropriate and unjustified and all of Energia's rights in respect of these matters are strictly reserved. This response details more specifically the issues which arise in respect of the capacity constraints methodology and why, on the face of the limited information provided, we are concerned that it may significantly understate the MW required in L2 areas, and specifically the Dublin area.

Regarding the proposed TSO methodology for identifying and quantifying locational constraints, we have two major concerns from the limited information made available:

- Firstly, the method of calculating the locational MW quantity to be used in the auctions appears deficient, being based on statistical mechanisms only appropriate when applied to a significant population of power plants and that breaks down when applied to smaller areas with very small numbers of plants;
- Secondly, lack of information on how regional demands are apportioned, in particular that it may not properly take account of the likely high demand growth in Dublin, including large Data Centre load which are expected to locate in the Dublin area.

The above limitations would significantly understate the MW required in the Dublin area.

More generally, there is insufficient information to provide a meaningful assessment of some very fundamental and critical elements of (in particular) the methodology for locational capacity. We therefore request that the RAs and the TSOs provide more information where indicated necessary in this response and further engage with respondents to elicit more fully informed views. Given the current lack of detail, parties must be afforded the opportunity to review and critique the application of the methodology at later stages of the implementation process. Of particular importance are the demand assumptions that will be applied to Dublin for the locational analysis, for review and comment. In addition, it is not clear from the description provided how generation outages within the L2 area are taken into account. Is the MW level simply the MW level that must be dispatched on within the area to meet the TSSPS tests? If so, how is this MW level translated into a generation amount which must be cleared in the CRM to give an adequate probability that the required generation level will be available?

On the proposed amendment to the capacity requirement and de-rating factors methodology, Energia is of the view that insufficient information has been provided to allow meaningful assessment of the proposed changes. We would not have expected significant variation in de-rating factors solely because of demand profiles. We indicate in this response where more information is required.

No rationale is presented for the proposal to amend the methodology to average the Capacity Requirement across demand profile scenarios, as opposed to letting the least-worst regrets method select the demand profile scenario. Energia cannot support this proposed amendment without a valid justification.

Finally, we are surprised at the magnitude of the changes in the indicative de-rating factors compared with the values published in SEM-16-051a (3% to 5% lower). While acknowledging that quality assurance testing is still ongoing we would want to see (at a minimum) the level of detail provided previously – such as the de-rating factors by Technology Class and size. It is wholly

unsatisfactory that such detail is missing given the significance of the indicative changes and their material impact on the operation of the market and the viability of individual plant. This information should be published as a matter of urgency.

Energia also recommends, for reasons outlined in this response, that meaningful tolerance bands for de-rating factors be re-instated as provided for in Decision Paper SEM-15-103. The purported rationale for a zero tolerance band for all technology classes (with the one exception of DSUs) from I-SEM go-live is no longer tenable in light of the substantial reduction in de-rating factors now indicated. Simply put, it can no longer be true that *“unit outages generally tightly clustered around the proposed rates”*, as claimed in SEM-16-082 (para 4.4.1, p43). In the confidential annex to this response, we provide supporting evidence that there is “legitimate technical variation” to justify a meaningful tolerance band for Gas Turbines in particular.

# 1. Introduction and background

This document sets out Energia's comments in response to the Consultation Paper on the I-SEM Proposed Locational Capacity Constraints Methodology published on 13 April 2017 ("the Consultation Paper")<sup>1</sup>, including our feedback on the TSO methodologies outlined in its appendices.

The views expressed herein should be considered preliminary given the lack of sufficient detail in the Consultation Paper and its appendices. We would encourage the Regulatory Authorities (RAs) and the TSOs to provide more information where indicated necessary and to further engage with respondents to elicit more fully informed views. This is critically important in the context of formulating a successful State aid notification and ensuring continued security of supply. It is in these circumstances that Energia has sought, in the context of a tight deadline for responses, to review the proposed methodologies and provide as useful and constructive comments as possible. However Energia strictly reserves its right to make further comments as and when appropriate and this response is strictly without prejudice to any subsequent actions that may be taken by Energia.

Throughout the market re-design process Energia has raised a concern about the significant risk of inappropriate exit under I-SEM and DS3 arising from a market design that, at its core, is blind to locational issues and therefore does not allow the true value of energy and capacity to be discovered through competitive processes. Aligning with this view, the TSOs advised that "*a CRM auction result that satisfies the de-rated capacity requirement will not necessarily allow the TSOs to operate the power system within its operational limits while still satisfying the LOLE standard*".<sup>2</sup> They explained that the "*the loss of load expectation could be higher than predicted if the theoretical available capacity from a portfolio of generators cannot be delivered due to transmission or security limitations*".<sup>3</sup> Consequently, the SEM Committee decided in SEM-16-081 that "*[t]he scale of the risk to security of supply is such that it is appropriate to incorporate locational constraints within the CRM.*" (p28)

Thus the primary objective of including locational constraints within the CRM is to ensure the chosen security standard is maintained by procuring sufficient capacity within constrained areas. However competing with this objective is a desire on the part of the SEM Committee to limit the inclusion of locational constraints to those that *clearly and significantly affect capacity deliverability*, that can be identified and quantified *simply and transparently* to the maximum extent practicable, that *cannot overlap* at L2 level, and that must be specified

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<sup>1</sup> Consultation Paper "I-SEM Proposed Locational Capacity Constraints Methodology", SEM-17-027, 13 April 2017.

<sup>2</sup> See "I-SEM Capacity Remuneration Mechanism: Proposed Methodology for the Calculation of the Capacity Requirement and De-rating Factors", page 36.

<sup>3</sup> Ibid, page 36.

*in MW terms* (as opposed to a minimum number of units as per current practice). Given the restrictive and simplifying nature of the above principles, it is not surprising that the SEM Committee further clarified in SEM-16-081 that “[w]here appropriate, it may be necessary for the TSOs to enter into separate contractual arrangements for the procurement of local system services where they are required for local system security”. (p28)

This possible need for *contracting flexibility* was re-emphasised in recent SEM Committee decisions SEM-17-020 and SEM-17-022 in the context of highly restrictive bidding controls being implemented in the I-SEM balancing and capacity markets. However no detail was provided to give confidence that this approach will work or whether any *targeted contracting mechanism* intended to address local security of supply requirements will form part of the CRM State aid notification. We note that as these mechanisms will in effect complement the CRM, they would be an intrinsic part of the State aid measures being contemplated and the relevant State authorities are accordingly required to include them as part of the CRM State aid notification. Whilst the SEM Committee has stated that fundamental to their consideration of the overall CRM design is the European Commission State aid Guidelines (including the EC sector inquiry into capacity mechanisms), we have seen little to give us comfort that sufficient attention has been given to the reasons for the locational issues arising and whether, from a very practical perspective, it is in fact possible to address, and rectify, them by way of the CRM in a manner that is consistent with the requirement of the State aid Guidelines. This is particularly the case where the purpose of a targeted mechanism would be to make up for *missing money*<sup>4</sup> arising out of the very design of the energy and capacity markets and the prescriptive regulatory approach adopted and / or to correct for a capacity constraints methodology that may significantly understate the MW required in L2 areas and specifically the Dublin area. Energia has set out in response to previous consultations and correspondence the reasons why the proposed controls are inappropriate and unjustified. Its position remains the same and all of Energia’s rights in respect of these matters are strictly reserved. This response, which builds on our previous submissions, details more specifically the issues which arise in respect of the capacity constraints methodology and why, on the face of the limited information provided, we are concerned that it may significantly understate the MW required in L2 areas, and specifically the Dublin area. In particular we note that the method of calculating the locational MW quantity to

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<sup>4</sup> Missing money is any potential shortfall in *revenue* relative to a competitive market price where the competitive price reveals the economic value of (even temporary) scarcity. Missing money is not defined in terms of costs (specifically, a failure by generators to recover the SEMC’s view of Net Going Forward Costs in capacity markets and/or their Short Run Marginal Costs in energy markets). Under EU Competition law, the standard used to judge whether prices are fair – that is, not unfair - in a setting characterised by the presence of significant market power includes both avoidable and sunk fixed costs, as well as variable costs.

be used in the auctions appears deficient, being based on statistical mechanisms that are only appropriate when applied to a significant population of power plants and that break down when applied to smaller areas with very small numbers of plants. It is also unclear if the proposed methodology properly takes account of the likely high demand growth in Dublin, including large Data Centre load which are expected to locate in the Dublin area.

The remainder of this necessarily brief response is structured as follows. Section 2 summarises our key conclusions. Section 3 provides more detailed comments in respect of the proposed methodologies. Finally section 4 calls for the re-instatement of a meaningful de-rating tolerance band and the provision of more information to explain the significant change in indicative de-rating factors.

## **2. Key conclusions on proposed methodologies**

There is insufficient information to provide a meaningful assessment of some very fundamental and critical elements of (in particular) the methodology for locational capacity.

This includes the methodologies for

- a) assessing the location and boundaries of transmission constrained (“L2”) zones, and
- b) assessing the MW generation requirement within the L2 zone.

While the detail and specificity is missing, some of the concepts alluded to in the papers are concerning. In particular, some of the concepts deployed in the CRM mechanism more generally, are based on statistical mechanisms which are only appropriate when applied to a significant population of power plants (e.g. probabilistic assessment of generation adequacy, de-rating methodology). Therefore, while they are generally appropriate (and well tested over time) in assessing the adequacy of larger areas (island of Ireland; Ireland) with comparatively large populations of generators, they break down when applied to smaller areas with very small numbers of generation units.

The biggest concerns are;

- Firstly, the apparent inadequacy in the methodology for assessing the generation quantity that it is necessary to contract in an “L2” constraint area, to provide the generation dispatch quantity needed to meet network security standards;
- Secondly, lack of information on how regional demands are apportioned, in particular that it may not properly take account of the likely high demand growth in Dublin, including large Data Centre load which are expected to locate in the Dublin area.



The above limitations would significantly understate the MW required in the Dublin area.

Regarding the proposed amendments to the methodology for calculation of the capacity requirement and de-rating factors (SEM-17-027 Appendix 2), the extent of the changes and potential impacts is not clear, in part because the original description of the methodology is somewhat ambiguous. However the proposed amendment to select the overall Capacity Requirement by averaging across demand profile scenarios for the selected demand level, is likely to result in a lower overall capacity requirement compared to the alternative of allowing the least-worst regrets method to select the demand profile scenario. No rationale is presented for this proposed modification and we do not support it.

### **3. Detailed comments on proposed methodologies**

#### **3.1 Demand assumption for locational analysis**

Energia concurs with the proposal to utilise the 2021/22 year as the base demand for the Locational Analysis. The rationale set out in SEM-17-027a clearly supports this.

The proposal to adopt the demand level scenario selected by the Least-Worst Regrets analysis (from the demand scenarios interspersed between the “GCS Low” and “GCS High”), is also appropriate. Indeed, an argument could be made for adopting a higher demand assumption for analysis of network security, given the relatively stark consequences of breaches of network security. On balance though, the proposal seems to be a reasonable compromise.

For analysis of both L1 and L2 constraint regions, the assumptions for demand within the constraint area is critical. The GCS sets out different demand forecasts for Ireland and Northern Ireland (the indicated L1 zones), but does not contain specific information on the demand for the Dublin area (indicated to be an L2 region). SEM-17-027a refers to the Ten Year Transmission Forecast Statement (TYTFS) for the methodology for forecasting demands at individual transmission stations.

The TYTFS methodology (for general demand growth) appears to be based on historical distribution patterns. Best practice dictates that variances in regional growth patterns should be anticipated, rather than taken account of only after they have occurred (as is done clearly for the L1 constraint regions).

Have the TSOs any information as to likely variations in regional growth, particularly in the Dublin area, given the high level of commercial and residential development underway in the Dublin area? Do the TSOs consider that regional variations in demand growth should be taken account of in forecasting?

Also the last information available on demand distribution appears to be from TYTFS 2015 (data freeze date July 2015). This information is now almost two years' old and is therefore out-of-date. Can the TSOs provide more recent information, or indicate when it is likely to become available?

Of still greater importance, is the assumptions made regarding the location of new large “spot loads”, including Data Centres. The latest GCS states that growth in Ireland will be driven substantially by Data Centre demand, particularly in the high demand scenario. It also notes that a significant proportion of the Data Centre demand will materialise in the Dublin Region. Therefore, it must be assumed that a very significant proportion of the peak demand growth in the period to 2021/22 (some 700 MW in the high demand scenario), will be located in the Dublin area.

In SEM-17-027a (Table 2), the TSOs indicate that the methodology will identify rising data centre demand in the Dublin area. However, no specific information is provided. The TSOs are requested to provide further information on the demand assumptions that will be applied to Dublin for the locational analysis, for review and comment.

### **3.2 Identification of L2 constraint areas and boundaries**

SEM-17-027 states that Dublin is indicated to be an L2 constraint area, which is of course very much to be expected, given the known network supply issues already existing for Dublin and the anticipated significant further load growth in the area.

The current constraints in Dublin are complex in nature and the decisions set out in SEM-16-081 will require that the constraints are represented more simply for the purpose of the CRM. The method of determining the L2 constraint area and its boundaries is described rather generally in the description of the methodology.

- Can the TSOs indicate which specific network tests within set of tests set out in the TSSPS, will be applied to determining the existence of an L2 area and its boundaries?
- Can the TSOs indicate the likely boundary of the Dublin L2 region, given that it will be necessary to simplify the representation from that applied today in system operation?
- Do the TSOs anticipate any additional complications in the application of the methodology, given the “nested” and overlapping constraints currently existing in Dublin?<sup>5</sup>

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<sup>5</sup> There is some ambiguity in SEM-16-081 which says that L2 regions cannot “overlap” – does that mean they cannot intersect, so that one L2 region is free to exist entirely within another L2 region?

- Energia believes that given the (perhaps understandable) lack of detail on the above issues, that parties must be afforded to review and critique the application of the methodology at later stages of the implementation process.

### **3.3 Identification of minimum generation MW requirement for the L2 area**

The initial step of the methodology to determine the generation requirement in an L2 area is to carry out simulations for non-compliant cases and increase the generation within the identified area until the constraints are alleviated (i.e. presumably, the network is then within criteria when the sub-set of tests from the TSSPS is applied to it).

It is not clear from the description how generation outages within the L2 area are taken account of. Is the MW level simply the MW level that must be dispatched on within the area to meet the TSSPS tests? If so, how is this MW level translated into a generation amount which must be cleared in the CRM to give an adequate probability that the required generation level will be available?

The use of the standard de-rating factor alone is clearly inadequate for this purpose if only a small number of generators are involved. As a purely illustrative example, suppose the generation dispatch requirement in an L2 area is 600 MW, which could be met by the de-rated capacity of two typical CCGT plants. If each plant has an outage rate of 10%, then for approximately 20% of the time the network could be outside security limits.

The normal de-rating factor approach works across a large population of units, but is clearly not adequate in this case. Also for the CRM as a whole, an important element of the mechanism is the option for generators to acquire their capacity obligation from other generators during outages. In a constraint zone with only a small number of generators, there are not adequate sources for generators to secure their obligation through secondary trading.

- Can the TSOs clarify how generation outages within the L2 region are taken account of in the assessment?
- SEM Committee decisions to date imply that all ROs (including those awarded for locational reasons) will be standardised products<sup>6</sup>. It is important to note in this context that secondary trading may not occur between generators within the same constraint zone as there will be limited generation sources available to trade with.

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<sup>6</sup> This is despite the fact that providing capacity in a specific location is a distinct service from providing capacity in general, where capacity in a specific location is necessary for system security reasons and therefore its value will necessarily be higher.

Energia reserves its position on this aspect of the locational mechanism, until further clarification is given on these critical elements.

### **3.4 Proposed amendment to capacity requirement and de-rating methodology**

Energia understands the desire to address variability or instability in the de-rating factors, but is of the view that insufficient information has been provided to allow meaningful assessment of the proposed changes. We would not have expected significant variation in de-rating factors solely because of demand profiles. Can the TSO provide information from their test runs which show the extent of variation in de-rating factors, and the effect of the proposed amendment to average across the demand profile scenarios?

No rationale is presented for the proposal to amend the methodology to average the Capacity Requirement across demand profile scenarios. The problem identified relates to variability/stability of the de-rating factors only. This does not seem in keeping with the existing overall methodology and philosophy where the capacity requirement is selected from the scenario identified by the least-worst regrets method. Energia cannot support this proposed amendment until a valid justification is provided.

## **4. Indicative de-rating factors and implications for tolerance bands**

We are surprised at the magnitude of the changes in the indicative de-rating factors compared with the values published in SEM-16-051a (3% to 5% lower for most technology classes). While acknowledging that quality assurance testing is still ongoing we would want to see (at a minimum) the level of detail provided previously – such as the de-rating factors by Technology Class and size. It is wholly unsatisfactory that such detail is missing given the significance of the indicative changes and their material impact on the operation of the market and the viability of individual plant. This information should be published as a matter of urgency. Also required is a more comprehensive explanation of the causality, including detailed analysis showing the incremental impact of each causal factor.

The magnitude of the changes in the indicative de-rating factors should also prompt an immediate re-instatement of meaningful de-rating tolerance bands. The purported rationale for a zero tolerance band for all technology classes (with the one exception of DSUs) from I-SEM go-live is no longer tenable in light of the substantial reduction in de-rating factors now indicated. Simply put, it can no longer be true that *“unit outages generally tightly clustered around the proposed rates”*, as claimed in SEM-16-082 (para 4.4.1, p43).

New information presented in SEM-17-027 indicating a 3-5% reduction in de-rating factors for Gas Turbines, Steam Turbines and Hydro Classes clearly

warrants a review of that decision before I-SEM go-live. In the confidential annex to this response, we provide supporting evidence that there is “legitimate technical variation” to justify a meaningful tolerance band for Gas Turbines in particular.