Integrated Single Electricity Market (I-SEM)

Capacity Remuneration Mechanism Detailed Design
Third Consultation (Supplemental)
SEM-16-052

A Submission by EirGrid and SONI

22 September 2016

Contents

1 INTRODUCTION

1.1 EIRGRID AND SONI

EirGrid holds licences as independent electricity Transmission System Operator (TSO) and Market Operator (MO) in the wholesale trading system in Ireland, and is the owner of the System Operator Northern Ireland (SONI Ltd), the licensed TSO and MO in Northern Ireland. The Single Electricity Market Operator (SEMO) is part of the EirGrid Group, and operates the Single Electricity Market on the island of Ireland.

Both EirGrid, and its subsidiary SONI, have been certified by the European Commission as independent TSOs, and are licenced as the transmission system and market operators, for Ireland and Northern Ireland respectively. EirGrid also owns and operates the East West Interconnector, while SONI acts as Interconnector Administrator for both of the interconnectors that connect the island of Ireland and GB.

EirGrid and SONI, both as TSOs and MOs, are committed to delivering high quality services to all customers, including generators, suppliers and consumers across the high voltage electricity system and via the efficient operation of the wholesale power market. EirGrid and SONI therefore have a keen interest in ensuring that the market design is workable, will facilitate security of supply and compliance with the duties mandated to us and will provide the optimum outcome for customers.

EirGrid and SONI have duties under licence to advise the CER and UR respectively on matters relating to the current and expected future reliability of the electricity supply. We have also been allocated responsibility for administering the Capacity Market Code through recent modifications to our TSO licences. This response is on behalf of EirGrid and SONI in their roles as TSOs and MO for Ireland and Northern Ireland, including as operators of the Capacity Market.

1.2 STRUCTURE OF THE RESPONSE

This document sets out EirGrid and SONI's response to the SEM Committee's supplementary consultation to the third consultation on the Capacity Remuneration Mechanism Detailed Design (SEM-16-042) published on the 24th Aug 2016.

Section 2 of the response provides an overview of the key points that EirGrid and SONI would like to emphasise as being of most importance.

Section 3 of the response provides our detailed comments on the specific chapters and sections of the consultation paper, including responses to the questions posed in the paper, which underpin the key points in Section 3.

2 KEY POINTS

The development of electricity systems must strike a balance between reliability and cost. This balance in Ireland and Northern Ireland is defined by a loss of load expectation of eight hours. In the SEM today, the power system of Ireland and Northern Ireland may have more capacity than is theoretically required to meet peak demand, but operationally situations do arise where combinations of planned outages and transmission limitations can mean that the supply and demand margin in specific regions is very tight.

At a time when the Ireland and Northern Ireland power systems are undergoing considerable change, some of this change relies on system margins that exceed of what is deemed necessary purely from a system adequacy perspective. As such, the management of the transition to the new energy, capacity and system service arrangements requires considerable care to avoid any disorderly exit of generation capacity, while at the same time facilitating new entry. Compliance with the notice requirements set out in the Grid Code are also important to ensure system adequacy.

We agree that the Capacity Market should have some regard for some of the more significant locational constraints, at least in this critical transition period. It is also important that the appropriate value has been placed on system services and has been allocated to providing units. Without the enduring arrangements reflecting the need for and value of the provision of system services, there is a risk of longer term inefficiencies. This response is based on the assumption that Capacity Market auctions take place after revenues from system services are known and that bids into the capacity auctions reflect any revenue shortfall after income from the energy market and system services have been taken into account.

In relation to the detailed options for inclusion of capacity constraints, we consider that options B, C, D and E all have merits, with a caveat that option D is unlikely to be deliverable in the timeframe based on the time required for design and implementation. We do not believe that Option A is sufficient as it does not deal with instances where a locational constraint is met by one or more of a set of units. All of these options are likely to require additional resources and will increase implementation costs.

Option E in our view deserves serious consideration as it may offer a more practical approach to the application of locational capacity constraints. It has the potential to be as transparent as the other options and would be more likely to guarantee an outcome that meets the complex needs of the systems. As this process would be ex-post, consideration is necessary as to whether this would align with the overall timelines for the Capacity Market processes.

We suggest the price should be on the basis of the highest-priced bid accepted in the unconstrained merit order. We also suggest that units that are constrained on are paid as bid and units constrained off receive the difference between the auction price and their offer price. This will ensure equitable treatment of all units; however, further consideration may be necessary in relation to the firmness of a unit's connection offer / agreement.

We see merit in the inclusion of the process for applying locational constraints in the capacity auction as an enduring part of the capacity market. As locational constraints fall away with the commissioning on new transmission capacity, these constraints will no longer constrain the auction outcome. On the other hand, as the generation, transmission and demand capacities evolve, new locational constraints may arise and need to be considered.

Consideration of DS3 System Services is important to ensure the correct balance of incentives exists to maintain an efficient and reliable system and also to deliver on policy objectives. The treatment of demand side, small scale and embedded generation is also of particular importance considering its ability to mobilise capacity in particular locations within a relatively short period of time.

Finally, we suggest that any locational constraints are published when available to ensure the market has full information prior to the auction.

3 EIRGRID AND SONI VIEWS ON THE CONSULTATION TOPICS

3.1 OUTLINE OF ISSUE AND PROPOSED SOLUTION

2.6.1 Do you agree with the assessment of the potential for exit and lack of new entry during the transition period set out in this section, and do you think that the potential for exit creates a security of supply issue given locational constraints?

An efficient and reliable supply of electricity is one that is provided by a diverse mix of organisations of different scales, business models, technology types etc. As such, it is of key importance that the capacity market and the market as a whole (including the energy, system services and capacity) creates a level playing field for investment in reliable efficient capacity that is a good fit for the needs of the market and underlying system. To achieve this level playing field requires that the market does not unduly discriminate on the basis of technology, fuel, location, etc. While this increases competition and introduces the necessary commercial risk to drive efficiency and innovation, it can introduce challenges where material differences do exist between one generation unit and another that are not resolved by the market. Location is one particular example and this is developed in consultation paper.

The presence of an adequate and secure transmission system is prerequisite for a competitive market as it represents the 'route to market' for all generation capacity. The transmission system should not represent a barrier to entry to the market. Nevertheless, it is not practical or economically efficient to remove all transmission constraints from the system at all times. The cost of such a level of investment is likely to exceed the benefits it would deliver to end consumers and as such a balance must be struck between transmission capacity that is economically efficient i.e. will result in a positive cost benefit and the transmission capacity that is not justified. It follows from this that there will always be a degree of locational constraints on the transmission system that may need to be supported by 'local' capacity.

In this regard, it is important to emphasise that we plan the system on the basis that units have to provide three years notice of their intention to exit the market under Grid Code. Where a participant is facing financial adequacy issues, this may not be foremost in their mind; however, any deviation from this requirement would have serious implications for our ability to operate the system securely and provide for necessary outages to cover planned maintenance, capital works on transmission system and new connections in both generation and demand.

As the demand and generation on the island are constantly evolving, the transmission system is constantly changing to facilitate these changes. The nature of transmission infrastructure is such that changes often need to occur over number of years. At a time where demand, generation and the transmission system are all undergoing significant change, we would be keen to emphasise the need to ensure adequate capacity across the system to facilitate these changes. This is particularly important in the transitional period. Having a T-4 auction will provide considerably more certainty for generators, suppliers and the ourselves as TSOs as it will provide a clear view of the likely evolution of capacity over the coming years and whether the planned transmission system is likely to give rise to locational constraints. In the meantime, we need to ensure that we ensure a smooth transition between the current Capacity Mechanism and the new Capacity Market.

Needless to say, any decision to enter or exit the market is likely to be based on a number of complex factors and these are likely to be different for different market participants. While we acknowledge the importance of the Capacity Market for ongoing investment in generation capacity[1] in Ireland and Northern Ireland, we are not in a position to indicate whether one participant or another would exit the market if their generation was not successful in the Capacity Auction or system services procurement process. Nonetheless, were units not successful in the Capacity Auction to exit the market in disorderly fashion (i.e. without providing adequate notice to TSOs as required under the Grid Code), this would introduce challenges to operating the system securely.

2.6.2 Do you agree that locational constraints should be incorporated in the CRM? Please elaborate your rationale in your response.

EirGrid and SONI believe that it be would important to ensure that the Capacity Auction outcomes do not result in a disorderly exit of generation capacity (without giving sufficient notice to the TSOs). Subject to a more detailed analysis of the extent of the locational constraints, the risk exists that generation capacity required for locational reasons in the short to medium term does not secure sufficient revenue from the Capacity Market and Systems Service arrangements and decides to shut down. Any clear and present risk to the security of the system is likely to result in market intervention and this in our view should be considered only as a last resort.

With this in mind, we agree that leveraging the competitive pressures present in the Capacity Market and System Services arrangements represents a more and efficient solution for end consumers.

In addition, as the Capacity Market is designed to ensure there is continued investment in capacity to meet the reliability standard of the Ireland and Northern Ireland systems, it is appropriate in our view to ensure that this capacity is that which can be used to secure the system.

2.6.3 Feedback in relation to the specific Grid Code requirements are sought in respect of the following:

- **The extent to which the Grid Code requirements can be relied upon to manage exit of plant which does not obtain a Reliability Option;**
- **Whether it is appropriate to provide assurances that generators which do not obtain a Reliability Option in the transitional auctions (which happen on a T-1 basis) be released from their obligations to give 3 years notice in accordance with the Grid Code; and**
- **Whether the Grid Code requirement should be extended from 3 years notice, to say 3 years 6 months to align with T-4 auction timings.**

It is important for the purposes of planning the system that EirGrid and SONI can rely on these Grid Code requirements. Nevertheless, we are open to possible changes to the way these obligations are defined. All levels of the power systems of Ireland and Northern Ireland are undergoing dramatic changes in the profile of both generation and

[1] All references to generation capacity throughout this response also include capacity in the form of Demand Side Units.

demand customers and it is important that these Grid Code obligations remain credible and relevant.

2.6.4 Do you agree with the key principles proposed for any locational capacity framework within the CRM?

Broadly speaking, the principles outlined in the consultation appear reasonable. We believe that in order for them to offer a clear direction as to what is appropriate, they need to be clearer in their meaning.

Principle 1) Any locational constraints taken into account within the CRM mechanism would only be used to represent local capacity deliverability constraints.

It would useful to clarify what is meant by local capacity deliverability constraints. In terms of identifying locational needs, it would be important that these terms are clearly understood so as to inform the scope of the relevant analyses required.

Principle 2) A locational need would only be included in the CRM mechanism where the need is clear and large.

It would be useful to clarify what 'clear' and 'large' mean in this context. In terms of identifying locational needs, it would be important that these terms are clearly understood so as to inform the scope of the relevant analyses required.

Principle 3) The means by which local capacity deliverability constraints are identified and quantified would be simple and transparent to the maximum extent practicable.

We would emphasise that level and complexity of the analysis that would be required to be undertaken to identify any capacity constraints is significant; however, we acknowledge the need for transparency and that a process which is not unnecessarily complex is required. It would be useful to understand what is considered an appropriate trade-off between complexity (and associated opacity) and accuracy.

2.6.5 Do stakeholders agree that clear and large existing capacity delivery constraints should be reflected within the CRM auction, for example limiting this to the North-South constraint and the Dublin area constraint?

We agree that significant locational constraints should be catered for in the Capacity Auction; however, at this stage it is not possible to say which constraints are required without carrying out further detailed analysis. . This will need to align with and consider the results of the multi-year system services procurement process.

2.6.6 Do stakeholders agree with the high level proposed solution for dealing with locational capacity issues?

We are in broad agreement on the proposed approach; however, as with anything of this nature, much depends on the detail of the proposals both in terms of the practicality of being able to identify locational needs and also of implementing any requirements in the capacity auction.

2.6.7 If you do not agree with or have further view any of the proposals or assessment set out in this section, please outline why and where relevant suggest alternatives.

We believe that the Capacity Market should remain focused on addressing issues relating to investment in reliable capacity (that is deliverable); however, it is important to emphasise that providers of other essential system services will not materialise unless sufficient and stable value is placed on these services. In this way, the correct mix of generation is more likely to be forthcoming. In short to medium term, as we transition into the new energy, capacity and system service arrangements, it may be prudent to retain a degree of flexibility in this regard to ensure that it is possible promote the continued investment in a reliable electricity supply.

3.2 AUCTION DESIGN FRAMEWORK

3.6.1 Which option do you prefer for the Auction Design Framework and why?

Option A: We do not favour this option as many system constraints can be fulfilled by a number of units.

Option B: We believe this option has merit. While this option would result in higher capacity charges to suppliers, it would ensure that more than adequate capacity is available to operate the system and would reduce the risk of high prices in the market due to reduced capacity margins (in particular during outage season). In the context of a large number of new generation and demand connections, a large amount of capital works on the system and challenging operational environment, this additional capacity would result a greater degree of flexibility over the coming years to facilitate the significant amount of changes that being experienced by the system. As such, this option in our view could result in lower costs to the consumer over the short term through increased capacity margin and in the long term through the ability to facilitate the necessary investments in generation, transmission and demand.

Option C: We believe this option also has merit. This option would address the local capacity constraints without increasing the capacity quantity allocated in the auction (relative to the unconstrained auction). This option would strike a balance between practicality and optimality. To ensure that the auction can solve within a reasonable amount of time, the combination of possible outcomes would need to be limited to a subset of the full set of outcomes. This may result in an outcome that is less optimal but potentially more intuitive than for a full optimisation of all permutation.

Option D: This option could be considered for longer terms solution but would not be deliverable for the initial auction. Using a mixed integer optimisation for the auction would ensure that outcome of the auction represents as optimal a result as is possible within the time allocated. This approach would also be less restrictive on the types of constraints that could be specified. Nevertheless, the degree of complexity in developing and testing such a system would in our view not be deliverable in time for the first T-1 auction. As such, we would not favour this outcome for the initial auction. The RAs may wish to consider an approach where this option is the enduring solution and options C is the interim; however, this would necessitate the development of two auctions systems – one for the interim, one for the enduring.

Option E: We believe this option has merit and should be given serious consideration. Subject to further detail on the amount of time that would be available to carry out the process, we favour this approach primarily as it ensures that we have a sufficient locational

capacity to operate the system securely at the end of the auction process. This is not guaranteed by the other approaches.

Determining the locational capacity constraints prior to the auction outcome is complex as all permutations of capacity market units have to be considered and whether these combinations result in security issues. Given the interdependency between units on the system, a simple constraint that specifies a minimum MW from a particular subset of units or a minimum number of units from a subset of units, it is not possible to guarantee that the ultimate outcome would be operationally secure. The reason for this is that the analysis will not be able to consider all permutations of all units over a period of multiple years and analyse them for operational security. As such, certain assumptions about the likelihood of certain units remaining on the system need to be made; however, there is no guarantee that these units will actually succeed in the auction and therefore, the constraints that may rely on their capacity may no longer be valid.

On the other hand, if the outcome of the unconstrained auction is known, the complexity of the analysis and number of permutations that need to be considered is greatly reduced. Based on the outcome of the unconstrained auction, we would apply our analysis to assess whether the successful portfolio would introduce security issues. Where security issues arise the units that can most economically satisfy the constraints could be assessed. This would be need to done in line with an agreed methodology and the process would need to be subject to the appropriate level of scrutiny and quality assurance.

While considering issues of much greater significance, this approach is analogous to the approach of constraining on and off units in the dispatch in the current SEM would identify units required and not required to satisfy the constraints. Units constrained on would be issued a capacity quantity at their offer price and units constrained off would be issued a second negative capacity quantity at their offer price (retaining the equivalent of their infra-marginal rent). This process of applying locational constraints need not form part of the primary auction and could be considered as an initial set of secondary trades.

Thus, the capacity price of the initial unconstrained auction is preserved, units constrained on are paid as bid and units that constrained off retain the infra-marginal rent that they would have earned had the constraint not been present. The amount paid back by the constrained off unit would be offset against the constrained on unit and the difference between these values would represent the locational capacity component of the capacity charge calculation.

We would not agree with the characterisation that this option is *too big a failsafe* or that it represents the TSOs taking over from the market when the market has produced an unacceptable solution. Similar to the current SEM and the proposed Day-Ahead, Intraday and Balancing Market, it is common in electricity markets for trading to take place on an unconstrained basis initially, maximising liquidity, then to be followed by trades that conform to the operational security requirements of the system (e.g. through the issuance of dispatch instructions based on constrained optimisation tools that operate the system at least cost or minimise the cost of deviating from the physical notifications). Therefore, this approach would not offer a carte blanche to the TSOs. Rather, the approach would arguably be more consistent with the approach adopted for the rest of the I-SEM arrangements. In addition, similar to other options, the ultimate outcome would be subject to the approval of the RAs.

Regarding transparency, we agree that this is important; however, we would suggest that all approaches that involve the specification of locational constraints are likely to be based on complex power system analyses and any approach adopted needs to ensure the appropriate level of scrutiny and quality assurance. All of these options are likely to require additional resources and will increase implementation costs.

3.6.2 Should the capacity price be set equal to: a) the highest-priced bid accepted in the unconstrained merit order; or b) the highest-priced bid which is both: accepted in the unconstrained merit order; and selected as a winning bid after lumpiness and locational considerations have been resolved?

We would favour option (a). While it is possible that the unit that sets the price is unsuccessful in the capacity auction due to their own lumpiness constraints or by virtue of a locational requirement, the unconstrained price is the price based on the relaxed auction process i.e. all offers are flexible and the auction clears at the intersection between the supply and demand curve. This approach would decouple the capacity auction price from the more complex process of solving the integer constraints associated with lumpiness and locational constraints. This would be important in particular where only a subset of permutations is considered e.g. in option C.

3.6.3 Should a bidder that would have been accepted in an unconstrained auction but which is not awarded an RO receive a "constrained-off" payment in the CRM? If yes, how should the "constrained-off" payment be determined, and why?

We believe that there is merit in allowing units that are constrained off to retain their infra-marginal rent i.e. the difference between their offer and the clearing price. Units that clear in the unconstrained auction (subject to lumpiness constraints) should be paid-as-cleared. Units constrained on and off should then be paid as bid.

There may be a case to consider that this should only apply to firm connection capacity and that units that clear in the non-firm range of their capacity should be constrained off at the capacity auction price (as opposed to their offer price).

3.6.4 How should local capacity deliverability constraints be defined?

This would depend on the option chosen. How a constraint is specified can have a significant impact on the computational complexity of the auction and we would suggest that the form is not overly prescriptive and allows for a number of approaches. The approaches currently considered for locational constraints tend to take the form of a minimum MW from a set of units or a minimum number of units from a set of units. A further question relates to how a unit is regarded to have satisfied the constraint e.g. *for a minimum number of units from a set of units* constraint would all a unit's offers be accepted or all their inflexible offer components. Adopting the latter could encourage flexibility in the offers.

3.3 LONGER TERM CONSIDERATIONS

4.4.1 Should the inclusion of locational capacity delivery constraints in the CRM occur in T-1 auctions, T-4 auctions, or both?

We consider that the process of including locational requirements should be retained as an enduring part of the Capacity Market. It may be the case that the transmission capacity in the future is such that it does not place any constraints on the system. In such a case, the locational capacity requirements would be non-binding. It also may be the case, that the RAs may not wish to apply the locational constraints until the T-1 auction; however, this all can be handled in the process for approval of the constraints prior to (or following) each auction.

4.4.2 What circumstances or criteria should be considered in relation to the T-4 auctions being conducted without explicit consideration of locational capacity delivery constraints?

We agree that the approach to locational capacity requirements needs to be kept under review, especially when considering any changes to the transmission use of system tariffs. In our view, the presence of the locational constraints (similar to the Dispatch Balancing Costs) would indicate the cost of locational constraints and offer an additional means to assess the impact of the transmission build on the wholesale cost of electricity.

4.4.3 Are there any further considerations that should be taken account of regarding the longer term management of locational capacity delivery constraints? If so please detail your rationale for these.

The interaction with evolution of the DS3 System Services process is important to ensure that appropriate value is being placed on all the components of a reliable electricity supply.

3.4 LOCAL SECURITY OF SUPPLY AND MARKET POWER

5.1.1 Do you believe that the suite of market power controls set out in CRM Decision 3 are sufficient to address any additional market power issues raised by local security of supply considerations? If not, what additional measure would you propose, and why?

We would suggest that any locational constraints are published as available to ensure that the market has full information prior to the auction. While this information could provide relevant generators with market power, it would also ensure that the appropriate level of scrutiny can be applied to these units.