



**Integrated Single Electricity Market
(I-SEM)**

**Capacity Remuneration Mechanism
Locational Issues**

Decision Paper

SEM-16-081

08 December 2016

EXECUTIVE SUMMARY

Introduction

Following publication of the CRM Decision 3 (SEM-16-039) further consideration has been given to the inclusion of locational capacity constraints within the CRM auction design. A CRM 3 supplemental consultation (SEM-16-052) was therefore published and responses were received on 22nd September 2016. Various forms of stakeholder engagement have taken place during the consultation and afterwards including a stakeholder workshop on the emerging thinking held on 9th November 2016. Feedback from stakeholders has been considered in arriving at the decisions within this paper. Within the wider CRM context, a further consultation (SEM-16-073) was published on 8th November 2016 relating to the CRM parameters.

Locational Issues - high level decision

The CRM auction is being developed on the basis of a single zone consistent with the I-SEM energy markets.

In the near term, there will likely be more existing de-rated capacity on the system than will be procured through the initial CRM auctions and, at least initially, there will be significant constraints on the transmission network. In this context, it is recognised that in practice the system is not indifferent to the location of capacity required to meet security of supply requirements across the island.

Having considered the development of the detailed auction design in recent months, the SEM Committee recognise that particular emphasis is needed to support the transition to the new CRM, including the management of locational issues. For example, until the required transmission investment is commissioned, there is a possibility that a plant required for locational reasons may not clear in the CRM auction. If any of the plants that were not awarded a Reliability Option subsequently determined that it was uneconomic to keep operating absent CRM revenues, and decided to close down or mothball, there could be a negative impact on security of supply.

To manage the issue, the SEM Committee considered the most appropriate approach is a framework within the CRM design aimed at ensuring there is sufficient generation adequacy in areas that are considered transmission capacity constrained. This framework formed the basis of the CRM 3 Locational Issues supplemental consultation (SEM-16-052) issued in August 2016.

Summary of Responses

20 responses were received to the CRM 3 locational issues supplemental consultation. Regarding the inclusion of key capacity delivery constraints within CRM, the responses were very mixed. Key concerns raised were that other markets were better suited to deal with locational constraint issues such as ancillary services/DS3; all constraints should be included and not just a select few which potentially leads to artificial modelling and the distortion of investment signals; and emphasis was placed on the need for network investment together with clear signaling from Generator Transmission

Use of System (GTUoS) and Transmission Loss Adjustment Factors (TLAFs). Of those who did support key locational constraints within the CRM had mixed views on how and to what extent they should be incorporated into the CRM design. Those supporting the inclusion of locational constraints broadly supported their inclusion within both the transitional and enduring auctions, although some were of the opinion that they should only be applied on a temporary basis i.e. transitional period.

Responses associated with the auction design had equal support for either a simple sealed bid with the additional capacity for key constraints (Option B) or an unconstrained auction run followed by TSOs identifying must run units (Option E). A few respondents proposed a hybrid of options B & E in which a full system assessment follows the unconstrained run with all in-merit bids given a CRM Reliability Option. Limited support was received for a simple sealed bid with a heuristic step (Option C) and a combinatorial auction (Option D). No support was given for ex-ante identification of “must not exit” units (Option A).

There was strong support for setting the capacity auction clearing price at the unconstrained price i.e. the highest priced bid in the unconstrained merit order. When considering compensation for unsuccessful in-merit bidders, a mixed response was received with a small majority favouring no compensation being provided.

Respondents proposed alternative approaches which included bi-lateral/strategic reserve contracts, ancillary services/DS3 scalars, strengthening Transmission Loss Adjustment Factors (TLAFs) and Generator Transmission Use of System (GTUoS) signals and greater focus on network investment.

The Grid Codes currently requires a three-year notice period if a plant (over 50MW) chooses to close. Respondents were clear that this Grid Code requirement cannot be relied upon due to financeability and legal concerns. A number of respondents proposed a modification to the Grid Codes to align with T-1 auction flexibility and proposals ranged from 3 months to 1 year.

Summary of Locational Issues Decision

At a high level, the SEM Committee has decided that:

- The likely level of transmission constraints and the potential scale of exit creates a security of supply issue for the first transitional auctions;
- In as far as is practical, the SEM Committee wishes to implement a market based solution for dealing with transmission constraints that affect capacity deliverability;
- The scale of the risk to security of supply is such that it is appropriate to incorporate locational constraints within the CRM.

Most consultation respondents recognise that transmission constraints are an issue which could jeopardise security of supply in the short term, and that some form of action is necessary to address the issue. However, there were a wide range of views on what the solution to the issue should be and no consensus, with a number of respondents favouring solutions outside the scope of CRM, such as dealing with the issue via bi-lateral system service contracts, or bundled “all-in” contracts which compensate the recipient for a combination of local capacity and system service provision. However, the SEM Committee believes that these solutions would lead to non-market based outcomes. The SEM

Committee is of the view that it is possible to address the issue of local deliverability of capacity within a market-based CRM solution, which may be capable of delivering competitive outcomes via auctions.

If material competition does not emerge in the auctions, the outcome of the competitive process will result in the award of a targeted “pay-as-bid” Reliability Option at a regulated price, since the bids of all existing generators will be subject to the Existing Capacity Price Cap, or an individually scrutinised Unit Specific Bid Limit. This outcome, will be no worse in terms of competition than bi-lateral negotiations, and may result in better outcomes for customers if there is even limited competition in constrained areas. The CRM solution may also be accompanied by other targeted measures associated with localised provision of system services.

The SEM Committee has further decided that the following principles should impact the way in which locational constraints are reflected in the CRM:

- Any locational constraints taken into account within the CRM mechanism would only be used to represent local capacity deliverability constraints;
- A locational need would only be included in the CRM mechanism where the need is clear and significant;
- The means by which local capacity deliverability constraints are identified and quantified would be simple and transparent to the maximum extent practicable. The Regulatory Authorities are currently working with the TSOs to determine which constraints should be included for the first transitional auction, and the definition of the constrained zones, and the minimum requirements in each zone.

Following on from the high-level decision to reflect transmission constraints in the first transitional auctions, this decision paper focuses on the following consequential elements and some CRM design issues which were purposefully not decided upon in the CRM Decision 3, due to the interactions with locational issues. Key areas of this decision relate to:

- **Auction Format and Winner Determination.** As part of the consultation we indicated that Option C might be a logical interim solution. However, following further analysis, including taking account of consultation responses, the SEM Committee has decided the following with regard to Auction Format and Winner Determination:
 - **In the short term, the SEM Committee has decided to adopt Auction Format Option B,** which entails CRM Auction Format Option 1 (simple sealed bid) with any capacity secured to meet constraints being additional to that which clears in the unconstrained auction. Option B shall apply to all transitional, T-4 and T-1 auctions until such time as the SEM Committee instructs the CRM Delivery Body to implement Option D;
 - In the longer run, the SEM Committee intends to implement Auction Format Option D, which entails a full combinatorial auction. The approach to including locational constraints in the T-4 longer term auctions is set out below;
- **Capacity Clearing Price Determination.** The SEM Committee has decided to implement **Option 1: The highest-priced bid accepted in the unconstrained merit order.** Given the decision to adopt Auction Format Option B, at least in the short run, bidders which are in-merit cannot be rejected for locational reasons. However, the marginal bidder may still be rejected for inflexibility reasons.

If the marginal bid in the unconstrained merit order is not accepted for inflexibility reasons, its price will still set the clearing price. In other words, this represents the unconstrained clearing price;

- **Compensation of unsuccessful in-merit bidders. The SEM Committee has decided not to make any payments to unsuccessful in-merit bidders (Option 1).** Given the decision to adopt Auction Format Option B, at least in the short run, (partially) in-merit bidders can only be unsuccessful for inflexibility reasons, not locational reasons anyway;
- **Representation of constraints. The SEM Committee has decided to implement Option 3: Nested capacity areas** (with capacity requirements specified in MW).
- **Treatment of constraints in T-4 auctions:**
 - The SEM Committee agrees with a number of respondents who argue that it is appropriate to review locational signals (GTUoS and TLAFs) which may provide at least partial solutions to the handling of transmission constraints in T-4 auctions. However, **it is not clear to what extent it will be possible to complete a full review of locational signals sufficiently prior to the first T-4 auction** to ensure that they will provide a sufficient solution to constraints in the CRM, without the application of other measures too;
 - It is important that longer term locational constraints are addressed and to ensure the most efficient means of solving these constraints is sought for the benefit of consumers. This requires the continued assessment of network investment and any other actions by the TSOs which could lead to cheaper alternatives to the inclusion of constraints within the CRM auctions.
 - At this time, we cannot be sure to what extent we can be sufficiently confident that transmission constraints will be alleviated prior to the first T-4 auction that there will be no requirement to reflect transmission constraints in the first t-4 auction. **We will therefore require the T-4 auction system (including one that implements Auction Format Option D) to be capable of handling a range of identified transmission constraints;**
 - However, before making a decision to implement them in the first T-4 auction, we would propose to consult again on the pros and cons of including them in that auction, at a time closer to the first T-4 auction, when more is known about the scale of plant exit, and more information is known on progress in reviewing locational signals, and in reinforcing the transmission system;
 - Of course, if a particular constraint remains persistent then there will be a need to consider a bidding zone review process under the Capacity Allocation and Congestion Management (CACM) Regulation.
- **Additional local security of supply issues and market power:**
 - The SEM Committee has decided that New Build plant will only be able to get a Reliability Option of more than 1 year duration in the transitional auctions, if it is in-merit in the unconstrained auction, i.e. if its bid price is less than or equal to the clearing price. Exceptions may be made on a case-by-case basis if the minimum requirement in a nested zone cannot be met any other way.

- An extensive suite of market power controls measures was set out in CRM Decision 3 (SEM-16-039), and the proposed level of those controls in quantitative terms is being discussed in the CRM Parameters consultation (SEM-16-073). Given what we are proposing in the CRM Parameters paper (SEM-16-073) for the Existing Capacity Price Cap, the SEM Committee has decided not to apply any additional ex ante controls on the market power of existing capacity providers at this time as a result of the incorporation of transmission constraints. The SEM Committee may choose to review this position, if there is a material change to the Existing Capacity Price Cap level.

- **Grid Codes provisions.** The SEM Committee recognises that potential changes to the Grid Codes provisions, which require a generator of 50MW or more to give three-years notice of closure, raise issues which are wider than just the CRM. Hence, we do not intend, at this stage, to initiate any changes to the Grid Codes to automatically allow a generator which does not win a transitional auction to close within the stated three-year notification period (while noting that a generator may seek a derogation from this condition). In this context the SEM Committee considers it appropriate that a wider review of such Grid Code provisions is carried out and will request the TSOs to take this forward through the relevant Grid Code governance processes.

Contents

EXECUTIVE SUMMARY	2
1 Introduction.....	9
1.1 Background.....	9
1.2 Purpose of this Paper	9
1.3 Consultation: Key Milestones.....	10
1.4 Responses to Consultation	11
1.5 Role of Auctions within the CRM Process	12
1.6 Locational Issues During Transition.....	13
1.7 Assessment Criteria	14
2 Outline of Issue and High Level Solution.....	16
2.1 Introduction.....	16
2.2 Consultation Summary	16
2.3 Summary of Responses	20
2.4 SEM Committee Response	22
SEM Committee Decisions	28
3 Auction Design Framework	30
3.1 Introduction.....	30
3.2 Consultation Summary	30
3.3 Summary of Responses	35
3.4 SEM Committee Response	37
3.5 SEM Committee Decisions.....	44
4 Longer Term Considerations	46
4.1 Introduction.....	46
4.2 Consultation Summary	46
4.3 Summary of responses	47
4.4 SEM Committee Response	49
4.5 SEM Committee Decisions.....	50
5 Local Security of Supply and Market Power.....	51
5.1 Introduction.....	51
5.2 Consultation Summary	51
5.3 Summary of Responses	53
5.4 SEM Committee Response	55

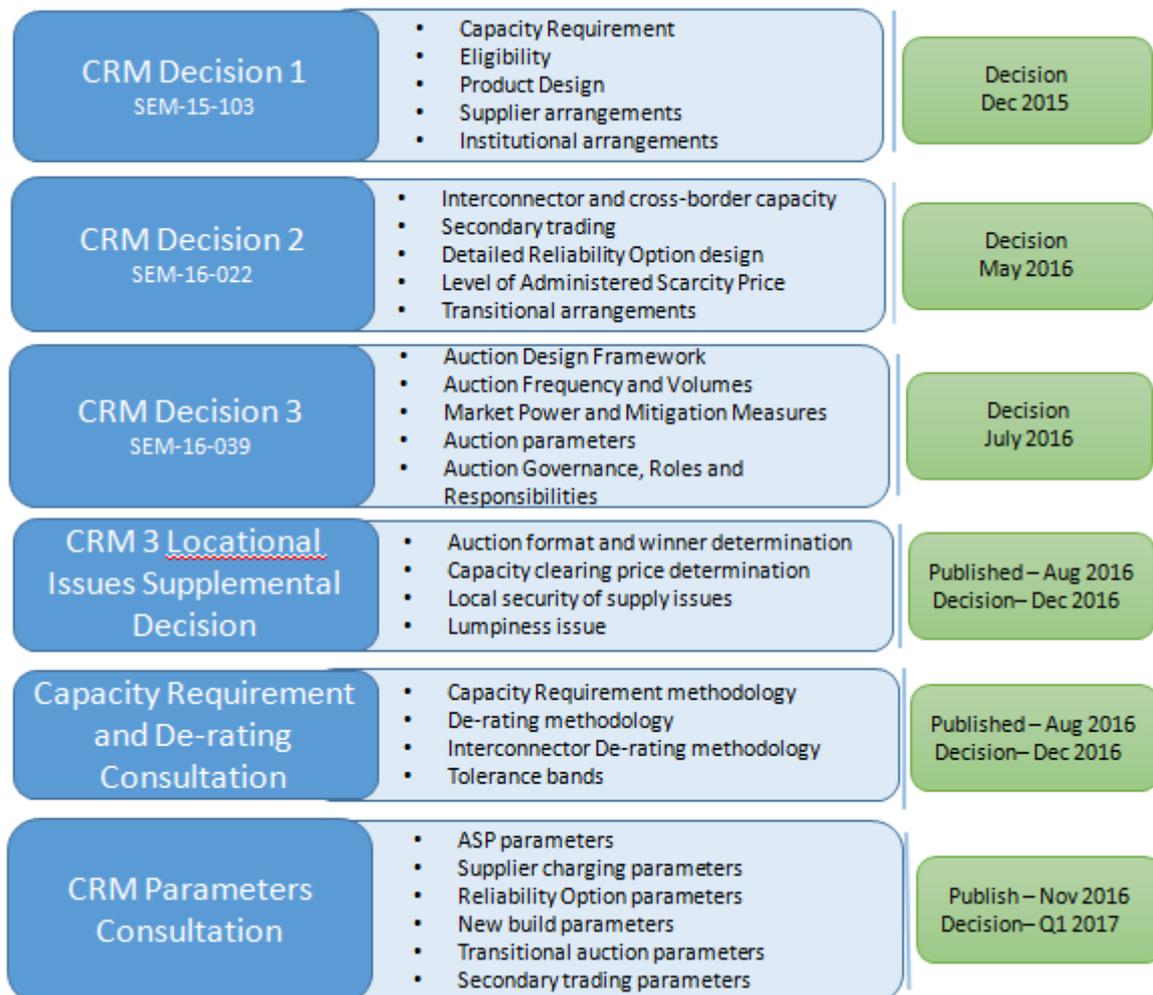
5.5	SEM Committee Decisions.....	59
6	Next Steps.....	61
7	Acronyms.....	62

1 INTRODUCTION

1.1 BACKGROUND

1.1.1 The purpose of the CRM Detailed Design is to develop through consultation the specific design features of the new capacity mechanism. This process is illustrated in Figure 1: Overview of CRM Policy Development below.

Figure 1: Overview of CRM Policy Development



1.1.2 During August and November 2016 separate consultations were published relating to the capacity requirement and de-rating methodologies and CRM parameters respectively.

1.2 PURPOSE OF THIS PAPER

1.2.1 This paper details the SEM Committee’s decisions specific to the treatment of locational issues within the detailed design of the I-SEM Capacity Remuneration Mechanism (CRM). The paper includes a summary of the responses made to the consultation paper issued on 24 August

2016, SEM-16-052, and sets out the SEM Committee's response to the key points raised. Where relevant, next steps are also set out.

- 1.2.2 The introduction of the CRM will involve notifying the proposed mechanism to the European Commission (EC) in relation to State Aid, a process which will be led by the Department of Communications, Climate Action & Environment (DCCA) and the Department for the Economy (DfE). The proposals in this paper have been developed to be consistent with guidelines published by the EC in this respect; however, the proposals are subject to the outcome of this notification process.
- 1.2.3 The structure of this paper is consistent with that of the consultation paper (SEM-16-052), with the key Sections summarised below:
- **Outline of Issue and High Level Solution:** Section 2 **Outline of Issue and High Level Solution** discusses the potential capacity requirement and potential exit, transmission constraints and solutions to address capacity delivery constraints within the CRM design;
 - **Auction Design Framework:** Section 3 **Auction Design Framework** sets out aspects of the CRM design which have interactions with the locational issues. These include the auction format and winner determination, the capacity clearing price determination and treatment of unsuccessful in-merit bidders;
 - **Longer Term Considerations:** Section 4 **Longer Term Considerations** considers the need for capacity delivery constraints within CRM for both the T-1 auctions and more specifically the T-4 auctions;
 - **Local Security of Supply and Market Power:** Section 5 **Local Security of Supply and Market Power** sets out the SEM Committee's view on CRM market power mitigation measures specifically in relation to local security of supply.
- 1.2.4 Each policy Section sets out a summary of the issues consulted upon, provides an overview of respondent's views, sets out the SEM Committee's response to the key points raised and then specifies the SEM Committee's decision on each matter (along with next steps, as relevant).

1.3 CONSULTATION: KEY MILESTONES

- 1.3.1 A comprehensive programme of stakeholder engagement on the issues contained in this paper has been carried out over the past number of months by the project team. The following bullet points outline some of the key milestones:
- 21 June - Issue raised at CRM 3 emerging thing workshop
 - 8 July – Outline of issue and proposal included in CRM 3 Decision
 - 24 August – Supplemental consultation published
 - 29 September and 27 October – Further SEM Committee discussion

- 9 November – Public workshop on emerging thinking
- 24 November – SEM Committee decision

1.3.2 In addition to these milestones, several further bilateral meetings have been facilitated with industry participants at various stages of the decision development process.

1.3.3 While recognising the proposals in this paper will be subject to the outcome of the formal State aid notification process, the project team (along with the two Departments) have also met with and discussed the key issues outlined in this paper with European Commission staff on a number of occasions.

1.4 RESPONSES TO CONSULTATION

1.4.1 This paper includes a summary of the responses made to the CRM 3 Supplemental Consultation paper specifically relating to locational issues (SEM-16-052) which was published on 24 August 2016.

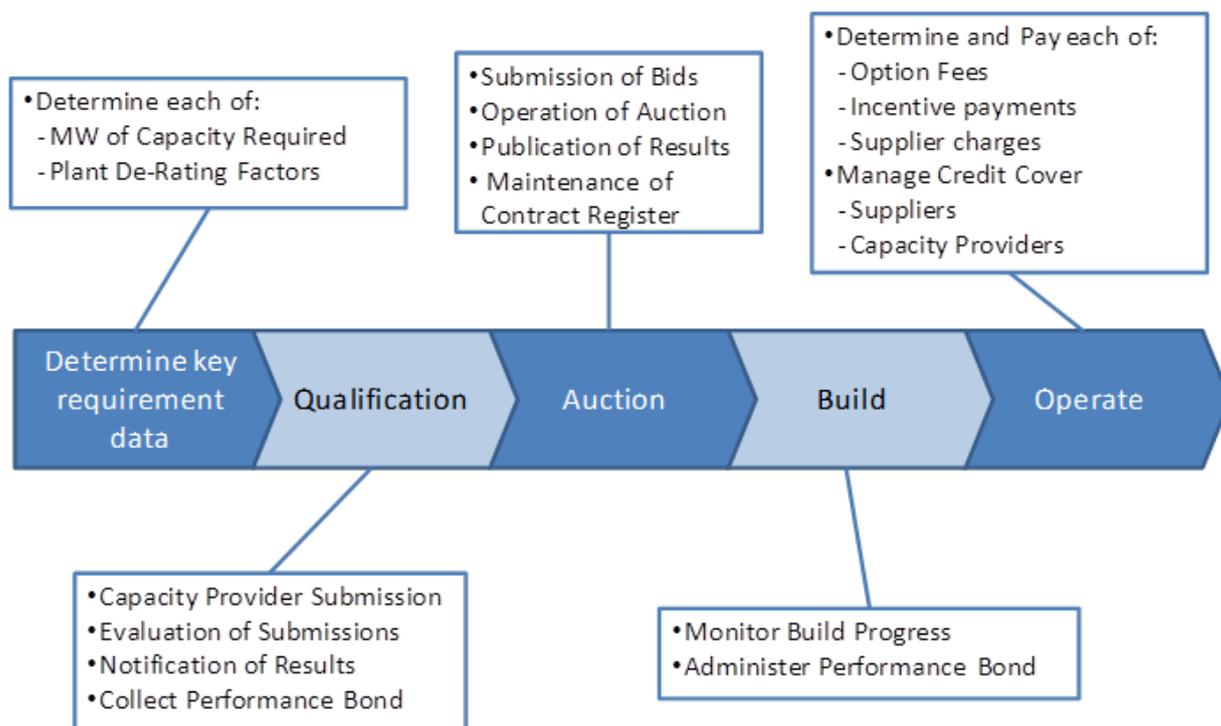
1.4.2 A total of 20 responses to the consultation were received. These were submitted from a wide range of interested parties including Generators, Suppliers, the Transmission System Operators, Network Owners and Industry Representative Groups. Of the 20 responses, three have been marked confidential. We note that most of the arguments raised in the confidential responses were a subset of the points made in the non-confidential responses, and the SEM Committee has not relied on any evidence presented in the confidential responses which is not available to all stakeholders. The remaining 17 are outlined below and copies can be obtained from the SEM Committee website.

- | | |
|-------------------------|------------------------|
| • AES | • Indaver |
| • BGE | • IWEA |
| • Bord na Mona | • IWFA |
| • Brookfield Renewables | • Moyle Interconnector |
| • Eirgrid/SONI | • Power NI PPB |
| • Electric Ireland | • Rusal Aughinish |
| • Energia | • SSE |
| • ESB | • Tynagh |
| • Gaelectric | |

1.5 ROLE OF AUCTIONS WITHIN THE CRM PROCESS

- 1.5.1 At a high level, an auction is a selection process designed to procure or allocate goods and services competitively. Auctions have played a key role in matching supply and demand in the electricity sector since the early 1990s and they are an important part of coordinating long term investment signals in capacity markets worldwide. An auction to secure capacity for the I-SEM CRM is therefore in line with international best practice as well as EU State Aid Guidelines.
- 1.5.2 At its core, the auction process involves three key processes: bidding, clearing and pricing. Figure 2: End to End Process for the I-SEM CRM illustrates how these processes will be implemented for auctions in the CRM:
- Qualified capacity providers will submit bids to the auction;
 - The CRM Delivery Body (EirGrid/SONI) will then operate the auction in accordance with the Capacity Market Code, using software developed in accordance with specifications set out in CRM decisions and supplementary decisions, and the more detailed rules and algorithms to be specified in the Capacity Market Code. The auction will select the winners (who will be awarded Reliability Options) and determine the clearing price(s);
 - In-merit auction winners will be paid the clearing price(s) which will be the Option Fee payable per MW of de-rated capacity. As a general principle, bidders selected out-of-merit for locational reasons, or for inflexibility (lumpiness) reasons will be paid-as-bid.
- 1.5.3 The auction design (including market power mitigation controls) will be the key to ensuring an efficient and equitable selection of capacity providers with fair competition between different capacity providers, and appropriate prices for capacity providers, and ultimately consumers.

Figure 2: End to End Process for the I-SEM CRM



1.6 LOCATIONAL ISSUES DURING TRANSITION

- 1.6.1 The CRM auction is being developed on the basis of a single zone consistent with the I-SEM energy markets.
- 1.6.2 In the near term, there will likely be more existing de-rated capacity connected to the all-island transmission system than will be awarded Reliability Options through the initial CRM auctions. At least initially, there will be significant transmission capacity constraints on the transmission network which will constrain the TSOs with regard to which generation plants will need to operate to maintain security of supply across the entire island. In this context, it is recognised that in practice the system is not indifferent to the location of capacity required to meet security of supply requirements across the island.
- 1.6.3 Having considered the development of the detailed auction design, the SEM Committee recognise that particular emphasis is needed to support the transition to the new CRM, including the management of locational issues. For example, until the required transmission investment is commissioned, there is a possibility that a plant required for locational reasons may not clear in the CRM auction and may choose to exit the market, leading to a security of supply problem.
- 1.6.4 To manage the issue, the SEM Committee sets out, in this paper, a framework within the CRM design aimed at ensuring there is sufficient generation adequacy in areas that are considered

capacity constrained. A proposed framework was outlined in a CRM 3 supplemental consultation on locational issues (SEM-16-052) issued on 24 August 2016.

- 1.6.5 Of course, if a particular constraint remains persistent then there will be a need to consider a bidding zone review process under the Capacity Allocation and Congestion Management (CACM) Regulation. The issue of how transmission constraint should be treated in the longer term is discussed more fully in Section 4: Longer Term Considerations.

1.7 ASSESSMENT CRITERIA

1.7.1 The assessment criteria for the detailed design of the CRM (including the auction design) are based on the same principles as those applied to the I-SEM High Level Design and as agreed with the Departments in the Next Steps Decision Paper published March 2013. We have developed detailed descriptions of these criteria to focus on issues that are relevant to procuring capacity and tailored to the detailed design elements of the capacity remuneration mechanism.

1.7.2 These assessment criteria are set out below:

- **The Internal Electricity Market:** the market design should efficiently implement the EU Target Model and ensure efficient cross border trade.
- **Security of supply:** the chosen wholesale market design should facilitate the operation of the system that meets relevant security standards.
- **Competition:** the trading arrangements should promote competition between participants; incentivise appropriate investment and operation within the market; and should not inhibit efficient entry or exit, all in a transparent and objective manner.
- **Equity:** the market design should allocate the costs and benefits associated with the production, transportation and consumption of electricity in a fair and reasonable manner.
- **Environmental:** while a market cannot be designed specifically around renewable generation, the selected wholesale market design should promote renewable energy sources and facilitate government targets for renewables.
- **Adaptive:** The governance arrangements should provide an appropriate basis for the development and modification of the arrangements in a straightforward and cost effective manner.
- **Stability:** the trading arrangements should be stable and predictable throughout the lifetime of the market, for reasons of investor confidence and cost of capital considerations.
- **Efficiency:** market design should, in so far as it is practical to do so, result in the most economic overall operation of the power system.
- **Practicality/Cost:** the cost of implementing and participating in the CRM should be minimised; and the market design should lend itself to an implementation that is well defined, timely and reasonably priced.

1.7.3 Also fundamental to the SEM Committee's consideration of the overall CRM design is the European Commission State Aid Guidelines, particularly in light of the EC energy sector inquiry including capacity mechanisms. Furthermore, we are actively engaged with the Departments (DCCA and DfE) and the European Commission as we develop the capacity market design as ultimately EC approval is required for the CRM auctions to commence.

2 OUTLINE OF ISSUE AND HIGH LEVEL SOLUTION

2.1 INTRODUCTION

- 2.1.1 With the move to a volume based CRM in the I-SEM, it is unlikely that all existing capacity will be awarded a Reliability Option. The volume of Reliability Options which will be awarded will depend upon the estimated Capacity Requirement (which is an input into the demand curve parameters), other demand curve parameters, and the auction bid prices submitted by market participants. In the CRM locational issues consultation (SEM-16-052) we estimated that it is possible that up to 2,600 MW of existing capacity will not be awarded a Reliability Option. Plant that does not receive any capacity payment may choose to exit the market¹.
- 2.1.2 Appropriate exit (as well as entry signals) are a key design feature of the new market. However, as set out in the CRM locational issues consultation (SEM-16-052), there is a concern that if, in the short term, the transmission system is constrained, if too much of the capacity that exits is in certain areas, it may create local security of supply issues. This section sets out the SEM Committee's high level approach to managing this issue.

2.2 CONSULTATION SUMMARY

Capacity Requirement and Potential Exit

- 2.2.1 In CRM Decision 2 (SEM-16-022), the SEM Committee decided that during the transitional auctions enough capacity should be secured so as to ensure plant needed at the end of the transitional period does not close having not been awarded a contract for the start of the period. In SEM-16-052, we quoted the example, that for capacity delivery year 2017²/18 enough capacity to meet the 2020/21 capacity requirement would be secured, and that the consequence was that during the transitional period, the All-Island Capacity Requirement may be around 2,600MW less than the EirGrid & SONI 2016 Generation Capacity Statement estimate of 2017 installed capacity.
- 2.2.2 These values were indicative, and reflected *inter alia*, the approach to de-rating and capacity requirement calculation which were being consulted on separately by the SEM Committee at the same time as the CRM Locational Issues consultation (SEM-16-052).
- 2.2.3 In CRM Decision 3 the SEM Committee made a decision to implement a sloping demand curve. Whilst clearly the effect of the sloping demand curve will impact upon the amount secured at auction, these broad estimates within the consultation paper indicate that there is potential

¹ Although for plant >50MW there is a Grid Code requirement to give the TSOs a minimum of 3 years' notice of

² Following the announcement made by the SEM Committee on 23 November 2016 that the I-SEM will begin parallel running in January 2018, and that the proposed go-live date for the I-SEM is now 23 May 2018, Capacity Delivery Year 2017/18 should be taken to refer to 2018 only, up to 30 September 2018.

that up to 2,600MW of “nameplate” capacity may not be awarded a Reliability Option in the first unconstrained auction (if prices bid are high), and may receive an exit signal.

- 2.2.4 The locational issues consultation (SEM-16-052) noted that other factors which impact upon whether plant can or will exit include existing Grid Code³ requirements and also other legacy support arrangements.
- 2.2.5 The Grid Codes in Northern Ireland and Ireland require generators (greater than 50MW) to give the respective TSOs three years’ notice of their intention to close capacity⁴. The SEM Committee sought feedback from stakeholders on:
- The extent to which the Grid Code requirements can be relied upon to manage exit of plant which does not win a Reliability Option;
 - Whether it is appropriate to provide assurances that generators which do not win a Reliability Option in the transitional auctions (which happen on a T-1 basis) be released from their obligations to give three years notice in accordance with the Grid Codes; and
 - Whether the Grid Code requirement should be extended from three years notice, to say 3 years 6 months or 4 years 6 months to align with T-4 auction timings.
- 2.2.6 There are a number of capacity providers who have legacy support arrangements which may influence the way in which they bid in the CRM (e.g. make them effective price-takers) and/or affect whether they exit or not, if they do not obtain a Reliability Option. Legacy support arrangements which may limit exit include various renewable support regimes, legacy PSO plant in Ireland and legacy Generating Unit Agreements (GUAs) in Northern Ireland.

Extent of Transmission Constraints

- 2.2.7 The TSOs’ Operational Constraint Update⁵ (July 2016) lists a number of System Constraints, which apply at the current time, including Active System Wide Constraints, Active Northern Ireland Constraints, and Active Ireland Constraints. Many of these constraints relate to the need for local ancillary service provision, in particular voltage support. However, a number of them relate to transmission capacity constraints, i.e. the lack of available transmission capacity that means that a minimum generation/storage/load reduction capacity must be located on one side of a particular transmission constraint. Some, but not all of these constraints may translate into constraints that should be included in a CRM auction.
- 2.2.8 In practice, it is difficult to categorise a constraint as fully being caused by a deliverability issue, or fully being caused by an ancillary services issue. There can be overlap. However, broadly speaking, from a capacity delivery perspective, it appears that there may be two key

³ Two separate Grid Codes exist for each jurisdiction and each has separate modification processes.

⁴ For generators below 50MW the requirement is for 2 years notice.

⁵ The TSOs publish updates on a regular basis and these can be obtained from the EirGrid Group website: http://www.eirgridgroup.com/site-files/library/EirGrid/OperationalConstraintsUpdateVersion2_40_July_2016.pdf

constraints⁶, which might not be satisfied in the transitional period if there is significant exit of existing capacity. The two areas which might end up with insufficient capacity are:

1. North of the North-South constraint, which exists between Ireland and Northern Ireland; and
2. In the Dublin area.

2.2.9 By implication, there may also be capacity in the rest of Ireland (particularly in the southern region), which is not effectively able to contribute fully towards meeting the security standard, due to the lack of sufficient capacity to export from these regions to the load pockets in Northern Ireland and in the Dublin area.

2.2.10 It is important to recognise that transmission constraints will evolve as, inter alia, the network develops and demand patterns change for example through the development of data centres in specific locations across the island. These operational constraints will continue to be a mix of capacity constraints and ancillary service constraints.

Linkage to Ancillary Services

2.2.11 The interaction between capacity and ancillary services constraints can be complex, the proposals in the consultation paper focused on developing solutions to solve local capacity issues and not necessarily to be viewed as a tool to solve ancillary services issues. The rationale for this is:

- The CRM is designed to assure capacity adequacy;
- Transparency of the CRM auctions; and
- Practical reasons support limiting the number of constraints.

2.2.12 Accordingly, a number of key principles have been identified which would be appropriate for any locational capacity framework within the CRM:

- 1) Any locational constraints taken into account within the CRM mechanism would only be used to represent local capacity deliverability constraints.
- 2) A locational need would only be included in the CRM mechanism where the need is clear and large.
- 3) The means by which local capacity deliverability constraints are identified and quantified would be simple and transparent to the maximum extent practicable.

⁶ Note that these constraints have been identified based on the operational limits, which do not represent a planning view of the needs of the system but rather the current operational needs. Note also that these constraints largely represent load flow requirements (but the issue of load flow is somewhat mixed with inertia and voltage as these are difficult to separate without more detailed study).

- 2.2.13 The SEM Committee proposed that at most two capacity delivery constraints, the North-South constraint, and a Dublin area constraint are considered for during transitional auctions. The SEM Committee are of the view that there is less evidence to suggest that there are more than these two capacity delivery constraints which could lead to local security of supply concerns at the current time. However, the use of three or more capacity delivery constraints within the CRM might not be practicable or efficient, and could undermine the viability of the CRM as an effective market-based mechanism.
- 2.2.14 There may be some plant which is required to support local ancillary service requirements, but not local capacity delivery, which does not receive sufficient revenue to cover its Net Going Forward Costs through a combination of all-island ancillary service tariffs, and Reliability Option Fees. The SEM Committee will separately review the appropriate compensation arrangements for any such plant outside the CRM, and notes that consistent with DS3 System Services Procurement Design Decision paper (SEM-14-108 December 2014), the option remains as a last resort for bi-lateral contracts where specific localised system security requirements can be demonstrated by the relevant TSO. It is noted that bi-lateral contracts to support localised ancillary service requirements are a feature of a number of electricity markets, and that the TSOs' licences oblige them to secure necessary ancillary services on an economic basis⁷.

Proposed Solution

- 2.2.15 The SEM Committee have considered a range of proposals to manage local capacity constraints and favour, to the maximum extent possible, leveraging the proposed CRM framework and using an "out-of-merit" Reliability Option (with a higher Reliability Option fee) as a mechanism to ensure sufficient capacity is available to deal with specified local capacity delivery constraints. In the longer term the SEM Committee also see merit in further developing the relevant transmission locational signals.
- 2.2.16 In this respect, the TSOs would be required to specify constraints before the CRM auction in a transparent manner to the satisfaction of the SEM Committee. Where the locational capacity delivery constraints were not met in an unconstrained analysis of capacity supply and demand in the auction, the CRM Delivery Body would award pay-as-bid Reliability Options to those out-of-merit capacity providers needed to satisfy the constraint, based on a set of deterministic rules which seek to identify a least cost solution.
- 2.2.17 As set out in CRM Decision 3 (SEM-16-039), each existing generator will be required to submit a bid, at or below the Uniform Price-taker Offer Cap⁸ (now named the Existing Capacity Price Cap). Thus, the price of the out-of-merit Reliability Option for an existing generator would be no higher than the Existing Capacity Price Cap, unless the generator concerned had successfully made the case to the SEM Committee that its costs exceed the Existing Capacity Price Cap.

⁷ For instance, in Ireland see Condition 11- Economic procurement of Asset, Services and Ancillary Services of the Consolidated Transmission System Operator Licence granted to EirGrid, March 2009

⁸ unless it puts in an application for a higher unit specific bid limit on grounds of higher Net Going Forward Costs.

2.2.18 The consultation paper focused on issues relating to implementing this proposed solution. However, views were also invited on other options that could be considered to address local capacity issues.

2.3 SUMMARY OF RESPONSES

2.3.1 A range of questions were asked in relation to the assessment of potential plant exit during the transition period, the inclusion of locational constraints within CRM and if so which constraints, feedback on Grid Code requirement and views on the high level proposed solution or alternatives.

2.3.2 Broadly, respondents recognised the potential for plant exit and the likelihood of new entry during the transitional period being limited. However, there was concern that the TSOs assessment of 2,600 MW of existing capacity not receiving a Reliability Option, and potentially exiting, did not reflect plant required for local security of supply purposes and some referred to the possibility that this could create significant system operational issues for the TSOs. A reference was made to the CRM Capacity Requirement and De-rating Methodology Consultation⁹ in which the TSO paper refers to:

“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.”

2.3.3 When asked if locational constraints should be incorporated into the CRM design the majority of respondents had considerable concerns and therefore they could not support such an approach. In general, it was viewed that locational constraints exist with or without a capacity market and their inclusion in CRM does not align with the I-SEM High Level Design. The simplistic inclusion of ‘clear and large’ locational constraints within CRM was viewed as being a piecemeal approach which would distort the capacity and energy markets without producing a secure and feasible solution. Therefore, the TSOs would still need to conduct a full system security analysis which may require ex-post adjustments e.g. ancillary or other bi-lateral agreements. Respondents considered a CRM auction adjusted for locational constraints would send inefficient exit signals and wrong entry signals. Given there is excess capacity on the island and the CRM will strengthen exit signals to capacity providers it is important the CRM is delivered in a clear, transparent, competitive and non-discriminatory method to provide the correct and fair exit signals.

2.3.4 Of those who did support the inclusion of locational constraints in CRM design did so to ensure there is continued investment in capacity to meet the security standard and to avoid the potential for load shedding. However, there were a number of caveats such as the inclusion should not distort the auction clearing price nor exclude in-merit bidders from receiving a Reliability Option. Support was generally for the transitional and enduring auctions

⁹ <https://www.semcommittee.com/sites/semcommittee.com/files/media-files/SEM-16-051a%20Appendix%201%20TSOs%20Capacity%20Requirement%20and%20De-rating%20Factors%20Methodology.pdf>

with some viewing the locational constraints as a short-term issue which should not drive the CRM enduring design nor influence multi-year Reliability Options awarded.

- 2.3.5 Regarding the proposal for the inclusion of ‘clear and large’ locational transmission constraints within CRM, respondents referred to the need to define ‘local’, ‘clear’, ‘large’ and also the area e.g. Dublin area, to allow further detailed analysis. Those supporting the inclusion of locational constraints broadly supported limiting the constraints to Northern Ireland and the Dublin area. Some respondents would only support the inclusion of all (including ancillary services) existing constraints rather than a dilution or simplification of the constraints which they viewed would result in inefficient outcomes requiring further adjustments for system security purposes.
- 2.3.6 In an effort to avoid complexity, reduced transparency and possible discrimination within the CRM, respondents proposed a wide range of alternatives to ensure an unconstrained CRM auction. They viewed constraints as not being a CRM issue but part of the TSOs responsibility to ensure system security, supporting constraints payments in the energy market and/or bi-lateral contracting (e.g. ancillary services contract, strategic reserve contract). Emphasis was also placed on the need for TSOs to assess network investment which could possibly be a cheaper alternative to the inclusion of constraints within the CRM auctions. Furthermore, a number of respondents strongly supported the strengthening of Transmission Loss Adjustment Factor (TLAF) signals and Generator Transmission Use of System charges (GTUoS) signals.
- 2.3.7 Feedback was sought regarding the existing Northern Ireland and Ireland Grid Code requirements for generators to provide three years’ notice (for 50 MW or above) of their intention to close capacity. The vast majority of respondents strongly opposed this requirement and stated it could not be relied upon to manage exit of plant which does not obtain a Reliability Option due to financial and legal grounds. In their opinion, the CRM design encourages exit but the Grid Code requirement prevents timely exit. The TSOs emphasised the importance on compliance with this Grid Code notice for system adequacy purposes. A small number of respondents considered the notice period to be reasonable in order to maintain system security and to send market entry signals to new entrants.
- 2.3.8 Other than those who support the three-year notice period there was general consensus that units which do not obtain a Reliability Option should be released from this Grid Code notice requirement. A couple of respondents suggested that the obligation should not be released but instead the notice period should be reduced. They proposed an alignment with T-1 auction flexibility of 3 months or reduce the notice period to one year.
- 2.3.9 Most respondents did not support extending the notice period to align with the T-4 auction timings. One respondent referred to the T-4 auction requiring an upfront obligation from generators who are successful in the auction and therefore the TSOs may not need the three-year notice requirement once CRM is implemented. A respondent considered a change of notice period as a possibility however any change must be relevant and creditable.
- 2.3.10 Some participants raised concerns that the consultation paper focused only on CRM and did not extend to a more holistic analysis with consideration of ancillary services/DS3, the impact

on the energy market and the need for transmission cost-benefit analysis to ensure that no Reliability Option can be awarded to resolve a constraint where a more cost-efficient transmission solution to that constraint is possible.

2.4 SEM COMMITTEE RESPONSE

Overall approach to including significant capacity constraints in CRM auctions

2.4.1 The SEM Committee notes that there was significant representation from the industry which on balance, does not favour the inclusion of capacity constraints in CRM auctions. However:

- Whilst there was recognition that there are material transmission constraints, at least in the short term, that they may affect security of supply, and that a solution needs to be found;
- There was no consensus amongst industry as to what alternative approach should be employed, if capacity delivery constraints are not accepted with the CRM, with differing respondents suggesting a variety of solutions including:
 - increased transmission investment;
 - a review of locational price signals (GTUoS and/or TLAfs);
 - relaxation of energy market bidding principles
 - a range of bi-laterally negotiated out-of-market arrangements;
 - and hybrid arrangements with elements of bi-laterally negotiated out-of-market solutions favoured by others.

2.4.2 Some of these proposals have significant merit in the longer term (transmission investment, review of locational signals) but cannot solve the issue for the first transitional auction. Other solutions (relaxation of energy bidding principles) are incomplete and will not guarantee security of supply. We consider that bi-laterally negotiated solutions do not have some of the advantages of the solution outlined in this paper (greater potential for competition, more complete hedge for Suppliers). We discuss these points further below.

Transmission investment and locational signals

2.4.3 There is merit in a review of the relative benefits of transmission reinforcement. However, in some cases, the time taken between identifying a need for new transmission investment and it actually being delivered, including time to get planning permission, means that there may be a disconnect between the need for transmission and the available transmission capacity.

2.4.4 As we discuss in Section 4, both a review of transmission investment and locational signals should be part of a long-term solution, and will play a significant factor in whether transmission constraints will also be reflected in T-4 auctions. However, neither of these proposals can deliver material impact in timeframes required for the first transitional auction, i.e. T-1 timescales.

Relaxation of energy market bidding principles

2.4.5 Relaxation of energy market bidding principles for bidders in constrained areas may allow them to bid a higher price on certain occasions and earn more infra-marginal rent. The argument is that it might reduce / remove the need for capacity providers in constrained zones to receive higher out-of-merit Reliability Options, by removing/reducing their “missing money” at the clearing price. However:

- It introduces a range of other market power issues- it may allow some generators to earn super-normal profits;
- It may not make any difference to the energy price received during times of scarcity and hence the level of “missing money”, the time when they are most likely to earn infra-marginal rent, since the energy price is likely to be set by Administered Scarcity Pricing at those times, rather than by the bids of market participants; and
- Will not be guaranteed to provide sufficient missing money for such capacity providers.

Pros and cons of the proposed solution versus bi-laterally negotiated solutions

2.4.6 The SEM Committee has previously considered a number of out-of-market based solutions for local security of supply related to capacity deliverability, including:

- Negotiated Reliability Options outside the market- i.e. bi-laterally negotiated;
- All-in contracts for local provision of capacity and possibly system services too. These contracts would not include an obligation to make difference payments, such as the strategic reserve contracts mentioned by some respondents. However, the defining difference between these different contract forms and negotiated Reliability Options is that they would not carry an obligation to make difference payments.

2.4.7 However, the SEM Committee is of the view that the benefit of the proposed approach is that:

- It has the potential for competitive pressure on capacity providers if “pay-as-bid” Reliability Options are awarded via a CRM auction- even if it is not guaranteed, and if competition does not emerge, we can still be sure that bidders cannot bid above regulated caps- the ECPC, or a Unit Specific Bid Limit (see SEM-16-077 for discussion of how these will be set). Competitive pressure would be absent in a bi-lateral negotiation;
- It will ensure that capacity providers in constrained zones also contribute to the Supplier hedge contained in Reliability Options- an advantage over other contract forms such as strategic reserve, although not over bi-laterally negotiated Reliability Options. The hedge for suppliers was one of the key reasons for choosing the Reliability Option approach at High Level Design stage.

- 2.4.8 If material competition does not emerge in the auctions, the outcome of the competitive process will result in the award of a targeted “pay-as-bid” Reliability Option at a regulated price. This outcome, will be no worse in terms of competition than bi-lateral negotiations, and may result in better outcomes for customers if there is even limited competition in constrained areas.
- 2.4.9 In practice, the outcome of the proposed arrangements will be similar in some respects to a negotiated Reliability Option or a strategic reserve contract, except for the winner and price which will be set through a competitive auction. Given the approach to setting the Existing Capacity Price Cap (ECPC) described in the CRM Parameters consultation (SEM-16-073)¹⁰, it is quite likely that any pay-as-bid Reliability Option will have to have satisfied the SEM Committee that its Net Going Forward Costs (NGFCs) are higher than the ECPC, i.e. “negotiated” unit specific bid limit. However, unlike in a pure bi-lateral negotiation, the bidder will also need to be mindful of competitive pressure from other potential capacity providers in its zone. The pay-as-bid Reliability Options could also be regarded as a form of strategic reserve awarded via a competitive auction. However, unlike strategic reserve contracts in some other European markets, the capacity provider will also be contributing to the hedge to suppliers, consistent with the vision in the I-SEM CRM High Level Design.
- 2.4.10 One stakeholder argued that the potential use of “pay-as-bid” Reliability Options for capacity providers in constrained zones potentially gives these capacity providers an unfair advantage in the energy market, and could lead to distortions in the energy market. Its argument is that if the capacity provider in the constrained zone receives a higher option fee than other generators with equivalent costs, it can bid more competitively in the energy market giving it a competitive advantage in the energy market and potentially leading to distortions in the energy market.
- 2.4.11 The SEM Committee does not believe that this is a valid argument for rejecting pay-as-bid Reliability Options as a targeted mechanism for the following reasons:
- Other feasible targeted contracting mechanisms would also have the same effect of giving more revenue to the generator in the constrained zone if it still “had missing money”, or some other drawbacks A local system services contract¹¹, or some form of all-in contract would have the same effect of giving a capacity provider in a constrained zone more money outside the energy market and therefore have the same effect. Some forms of strategic reserve contract preclude the generator from bidding directly into the energy market, and these capacity providers are not called on, outside periods of scarcity. However, if such contracts were applied to existing generators in the all-island market, it could lead to sub-optimal energy market dispatch, to the detriment of the consumer. As discussed above, given the likely transmission constraints that will exist for the first transitional auctions, not having a targeted mechanism is not an option- it would threaten security of supply.
 - Whether the capacity provider in the constrained zone gets additional fixed payment from a targeted mechanism should not make any difference to its behaviour in the energy

¹⁰ Which envisages setting the ECPC at a level close to where the unconstrained auction is likely to clear

¹¹ At least one which paid more than the short run marginal cost of providing the service, which it would have to do, to allow a capacity provider to cover its missing money

market. Any fears that it could use these additional funds to predatory price by bidding below cost are unfounded for two reasons. Firstly, predatory pricing is contrary to competition law, and the RAs have existing institutions (the Market Monitoring Unit) to monitor predatory pricing in the energy market, as well as extensive historic cost information about generators against which bids can be assessed. Secondly, as discussed in the CRM Parameters Consultation document (SEM-16-073) bids are expected to be set at a level which will allow out-of-merit to only recover their net going forward cost, and not including surplus money which could be used to cross-subsidise energy markets bids.

2.4.12 To those respondents who have argued that these arrangements would distort behaviour in the energy market, we would also point out, that a capacity provider in a constrained zone would also receive higher capacity payments if we moved to a zonal market. We also note that if transmission restraints become persistent, and following a bidding zone review process under the EC's CACM Regulation, it was subsequently decided that we should move to zonal capacity markets, all capacity providers in the constrained zones could receive a higher zonal clearing price. This approach is employed in US capacity markets, and is not considered to distort bidding in the energy market. It would be consistent with EC guidelines, and would make it harder for capacity providers in over-supplied zones to compete. However, the rationale for rewarding capacity at a higher price is clear- it should send an entry signal in under-supplied zones and an exit signal in over-supplied zones where the effect is more than transitory.

Consistency with High Level Design

2.4.13 The SEM Committee is of the view that the inclusion of locational constraints within the CRM is consistent with the I-SEM High Level Design (HLD), and that other elements of the detailed design decision set out in this document are consistent with that design. The I-SEM HLD decision decided that¹²

- i. *The I-SEM will include an explicit capacity remuneration mechanism (CRM).*
- ii. *The explicit CRM would work alongside any targeted contracting mechanisms that are put in place as a back stop measure to address specific security of supply concerns.*
- iii. *The explicit CRM will be a quantity-based mechanism.*
- iv. *The explicit quantity-based CRM will take the form of Reliability Options, which are financial call options issued to capacity providers by a centralised party through a competitive auction.*
- v. *There will be a requirement that the Reliability Options are backed up by the provision of physical capacity.*

2.4.14 In particular, the SEM Committee notes that following the completion of the detailed design:

- The CRM is an explicit quantity-based CRM, taking the form of Reliability Options, which are financial call options (which must be backed by physical capacity) issued to capacity providers by a centralised party through a competitive auction;

¹² See SEM-14-085a, page 8

- The CRM will be based on pay-as-cleared Reliability Options. All pay-as-cleared Reliability Options will, for the moment, be at a single all-island price- consistent with the principle of a single all-island price zone. Only where targeted interventions are necessary, will capacity providers be able to obtain higher priced “pay-as-bid” Reliability Options, and these will be at regulated cost based prices, since the bids of all existing generators will be subject to the Existing Capacity Price Cap (ECPC), or an individually scrutinised Unit Specific Bid Limit (see SEM-16-039). As set out in SEM-16-073, the ECPC will be set at a level which will not allow existing generators to exercise market power. However, as stated above, if constraints are persistent the principle of a single bidding zones may have to be reviewed, consistent with EC CACM Regulation;
- The CRM auction will also provide a mechanism to award targeted “pay-as-bid” Reliability Options to address any local capacity deliverability issues. The use of a targeted mechanism to operate alongside the main CRM is explicitly provided for in the I-SEM High Level Design¹³. The “pay-as-bid” Reliability Option facility may not be necessary, if it happens that sufficient capacity in constrained zones is in-merit in the unconstrained merit order, but provides a safeguard, if insufficient capacity is in-merit in the constrained zones. The fact that we are also using the auction mechanism (combined with auction bid controls) as means to delivering the targeted mechanism, does not entail any deviation from the High Level Design. The targeted “pay-as-bid” Reliability Options are also quantity based, with the quantity determined based on the shortfall between the localised capacity requirement, and the volume of Reliability Options awarded to capacity providers in that zone via the unconstrained auction.

2.4.15 Other targeted contracting mechanisms remain on the table to address other aspects of localised security of supply, for instance to address local system support service arrangements.

Other points raised

2.4.16 The SEM Committee does not agree that the simplistic inclusion of ‘clear and large’ locational constraints within CRM is a piecemeal approach which would distort the capacity and energy markets without producing a secure and feasible solution. It is viewed that including only material capacity constraints in the auction, and ignoring ancillary services constraints is likely to deliver a price which reflects the marginal value of capacity, and is not polluted by ancillary service considerations which are more appropriately considered within the context of ancillary service arrangements.

2.4.17 From a capacity adequacy perspective, the SEM Committee does not agree with the view 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” so long as the Capacity Requirement is appropriately defined. This point is

¹³ See SEM-14-085a, which says “*The explicit CRM described in the HLD does not preclude any targeted contracting mechanisms to be put in place as a back stop measure in line with national legislation in Ireland and Northern Ireland and the Security of Supply Directive (Directive 2005/89/EC) to ensure that security of supply is maintained*”

addressed further in the Capacity Requirement and Derating decision. The 2,600MW scale of potential exit quoted in the consultation paper included the incorporation of reserves within the Capacity Requirement, although the SEM Committee has now decided that operating reserves should not, for the moment be included within the Capacity Requirement (see Capacity Requirement and De-rating decision). However, whether scale of exit is 2,000MW or 3,000MW does not materially affect the key point- there is potential for significant exit, and in the light of the level of transmission constraints, the exit needs to be managed.

Summary evaluation of the case for including transmission constraints in CRM

2.4.18 The SEM Committee agrees that the TSOs would still need to conduct a full system security analysis which may require ex-post adjustments e.g. local ancillary service agreements, but considers a market based solution that includes significant constraints within a CRM auction to be a pragmatic approach which balances a number of objectives:

- **Security of supply.** The inclusion of significant capacity delivery constraints in the CRM auction ensures an adequate level of security of supply, with respect to *capacity*. Whilst recognising that other solutions are also capable of providing an adequate level of security of supply, it is important that the CRM ensure adequate capacity in the right locations. The use of other targeted mechanisms, such as bi-lateral arrangements with regard to local provision of system services, is not being precluded.
- **Competition.** Based on best currently available information, for the first transitional auction, all of Northern Ireland and the Dublin area may be constrained zones. Taking this much capacity out of the market based arrangements would severely curtail competition.
- **Practicality:**
 - There are potentially a large number of potentially overlapping constraints that would be introduced, if we tried to take account of both capacity deliverability and local ancillary service constraints in a single process. The TSOs' Operational Constraints document introduces a large number of operational constraints (over 20), the majority of which relate to ancillary service requirements. Trying to incorporate all these constraints in a competitive CRM auction would be impractical.
 - It is difficult to specify all constraints, including locational ancillary service constraints ex ante. Whilst the TSOs' Operational Constraints set out currently binding constraints, there is a material likelihood that exit signals resulting from the CRM auction may reveal other potentially binding ancillary service constraints.
 - There is wide-spread experience of including transmission constraints within a zonal capacity auction in US auctions. These auctions do not attempt to represent each and every potential constraint in the capacity auction.
- **Efficiency:** Including all capacity in the market which pays only for capacity, sends a better long-term capacity price signal than arrangements which exclude a large proportion of capacity from the market (although variants of the design with zonal capacity pricing, would send a better pricing signal if constraints are expected to be permanent).

Grid Code changes

- 2.4.19 The SEM Committee notes the position taken by a number of respondents, who objected to the reasonableness of the Grid Codes preventing the exit of a generator which did not obtain a Reliability Option in a transitional auction. However, the SEM Committee notes that this Grid Code provisions relates to wider issues than just the CRM- provision of localised system services and their impact on security of supply, for instance. We also note that the TSOs have expressed concerns at the risks associated with relaxation of this provision.
- 2.4.20 For the moment, the SEM Committee does not intend to at this stage, to initiate any changes to the Grid Codes in regard to this provision.
- 2.4.21 The SEM Committee notes that the governance of the Grid Codes provides for any party to raise a modification to the Grid code through the appropriate processes, so any party which feels that current provisions are inappropriate has a mechanism to initiate change themselves.
- 2.4.22 The SEM Committee recognises under the Electricity Regulation (Amendment) (Single Electricity Market) Act 2007, section 9, it has a statutory duty to have regard *"to the need to secure that authorised persons are able to finance the activities which are the subject of conditions or obligations imposed by or under this Act or the Internal Market Regulations or any corresponding provision of the law of Northern Ireland"*¹⁴ although clearly such provisions should not conflict with, for instance, State aid provisions. Where 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.
- 2.4.23 Such derogations as may be appropriate will be granted after consideration of all aspects of security of supply, including, inter alia, local system service requirements. In this context the SEM Committee also considers it appropriate that a wider review of the Grid Code provisions is carried out and will request the TSOs to take this forward through the relevant Grid Code governance processes.

SEM COMMITTEE DECISIONS

- 2.4.24 The SEM Committee has decided that:
- The likely level of transmission constraints and the potential scale of exit creates a security of supply issue for the first transitional auctions;
 - In as far as is practical, the SEM Committee wishes to implement a market based solution for dealing with transmission constraints that affect capacity deliverability;
 - The scale of the risk to security of supply is such that it is appropriate to incorporate locational constraints within the CRM.

¹⁴ Equivalent legislation in Northern Ireland: The Electricity (Single Wholesale Market) (Northern Ireland) Order 2007, section 9.

2.4.25 The SEM Committee has further decided that the following principles should impact the way in which locational constraints are reflected in the CRM:

- Any locational constraints taken into account within the CRM mechanism would only be used to represent local capacity deliverability constraints.
- A locational need would only be included in the CRM mechanism where the need is clear and significant;
- The means by which local capacity deliverability constraints are identified and quantified would be simple and transparent to the maximum extent practicable.

3 AUCTION DESIGN FRAMEWORK

3.1 INTRODUCTION

3.1.1 The CRM 3 Decision Paper (SEM-16-039) purposefully left certain key elements of the Auction Design Framework to be resolved in this CRM supplemental decision, due to interactions with the locational issues which are raised here. Specifically, these are:

- Auction format and winner determination;
- Capacity clearing price determination; and
- Treatment of unsuccessful in-merit bidders.

Each of these is explained below.

3.2 CONSULTATION SUMMARY

Auction Format and Winner Determination

3.2.1 In the absence of constraints, a simple sealed bid would be the preferred option as it is easy to implement, less amenable to the exercise of market power and more transparent than other options.

3.2.2 CRM 3 Decision (SEM-16-039) limited the extent to which combinatorial solutions could be applied to solve the inflexibility constraint. This prevented rejecting an in-merit bid (not including the marginal unit) in favour of the marginal unit, or out-of-merit units on grounds of lumpiness/ inflexibility. It did so, because otherwise smaller units are more likely to be rejected if there is a large inflexible unit on the margin¹⁵, and rejecting a smaller, cheaper unit would be inequitable. However, the SEM Committee did not preclude the possibility that bids which are in-merit on an unconstrained all-island basis would be rejected on grounds of locational constraints.

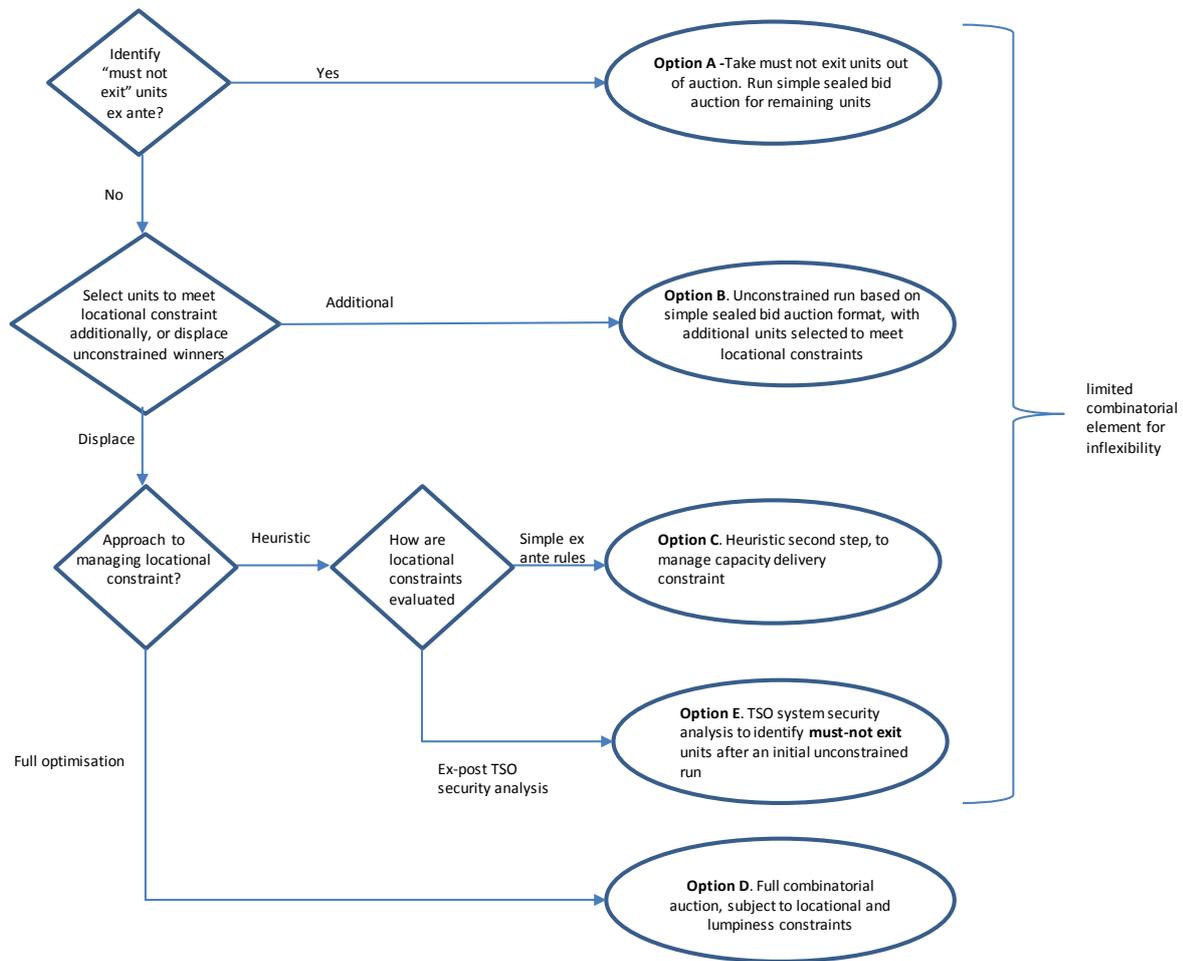
¹⁵ For instance, suppose that the supply and demand curves intersect at 7,000MW. The marginal unit is a large inflexible unit of 400MW, that take the supply curve from 6,800MW to 7,200MW. If there is a 10MW unit priced lower than the 400MW unit, then social welfare may be optimised by not accepting the 10MW unit, so awarding 190MW of RO in excess of demand, instead of 200MW in excess of demand

3.2.3 Against this background, a number of options exist for determining the auction winners, simultaneously taking both the lumpiness issue and locational capacity delivery constraints into account. The CRM locational issues supplemental consultation paper (SEM-16-052) built on the analysis/decisions set out in CRM 3 Decision Paper (SEM-16-039) and set out a list of options. The options differ in the solution technique they apply, and potentially in the way that locational constraints are defined.

3.2.4 The options detailed in the CRM locational issues consultation paper (SEM-16-052) are summarised below and also depicted in Figure 3: Auction format options for managing constraints:

- **Option A:** Ex-ante identification of “must not exit” units. These units would be taken out of the market and treated separately before the CRM auction is run. Their capacity contribution would be netted from the capacity requirement, and the residual requirements secured using a simple sealed bid option;
- **Option B:** CRM Auction Format Option 1 (simple sealed bid) with capacity secured to meet constraints being additional;
- **Option C:** Simple sealed bid, but with a “heuristic-based” second step which applies some rules to reduce capacity secured in surplus capacity regions to offset additional capacity secured to meet locational constraints, while at the same time addressing the lumpiness issue;
- **Option D:** CRM 3 Auction Format Option 3 (i.e. combinatorial). This option would find the optimal combination of bids to accept, subject to the locational capacity delivery and bid inflexibility constraints; and
- **Option E:** TSO system security analysis to identify must-not exit units after an initial unconstrained run.

Figure 3: Auction format options for managing constraints



3.2.5 When evaluating the above options against the assessment criteria there are varying differences particularly in respect of:

- **Internal market:** some options may have higher risk with compliance of State Aid Guidelines;
- **Competition:** some options remove bidders thereby reducing competition, while other options may be less transparent;
- **Efficiency:** will the solution deliver the optimum solution i.e. one which delivers the maximum social welfare?
- **Practicality and cost:** options vary in complexity impacting IT deliverability. Some options may not be deliverable for the first transitional auction(s) but could be feasible for subsequent auctions.

3.2.6 Within the consultation Option C (simple sealed bid with “heuristic-based” step) was considered as a logical interim solution. Nevertheless, the SEM Committee welcomed alternative views and analysis of all the options.

Capacity Clearing Price Determination

3.2.7 In the CRM 3 Decision Paper (SEM-16-039), the SEM Committee decided that the CRM auction would be:

- Pay-as-clear for winning bid segments whose bid price is in-merit; and
- Pay-as-bid for any bids accepted out-of-merit.

3.2.8 Due to the interaction with locational issues the CRM 3 Decision deferred the final clearing price determination decision. The CRM locational issues consultation paper proposed and explained the following two options:

- **Option 1:** The highest-priced bid accepted in the unconstrained merit order.
- **Option 2:** The highest-priced bid which is both:
 - (a) accepted in the unconstrained merit order; and
 - (b) selected as a *winning bid* after lumpiness and locational considerations have been resolved.

Unsuccessful In-merit Bidders

3.2.9 A question remains as to the treatment of any bidders that would have been accepted in an unconstrained auction, but which are not awarded a Reliability Option because of constraints (whether locational or inflexible, or a combination) and whether they should be compensated for being “constrained-off”. In the CRM 3 Decision paper, the SEM Committee did not envisage making payments to capacity providers constrained-off for inflexibility reasons. The SEM Committee does not favour compensating capacity constrained-off for locational reasons either, but the pros and cons of compensating constrained-off capacity providers was discussed in the locational issues consultation paper. Listed below are the compensation options discussed in the paper:

- **Option 1:** No compensation;
- **Option 2:** Compensation based on “lost profit”; and
- **Option 3:** Compensation based on “pay-as-bid”.

3.2.10 A preliminary evaluation of the options suggests that Option 1 is favoured. Option 2 may result merely in a deadweight payment to the bidder with no efficiency benefits, whereas Option 3 could impose a certain and significant cost on consumers, which is not guaranteed to payback in subsequent years.

Representation of Constraints

3.2.11 There is a question as to how locational capacity delivery constraints should be numerically represented.

3.2.12 In the SEM, there is a history both of expressing the Operational Constraints on a unit basis (for example “X out of Y units in this location are needed”) and on a MW basis (for example “there should be at least X MW of capacity located in {name of zone}”)¹⁶. The SEM Committee are inclined towards a MW basis for expressing constraints, as this is a metric which is directly comparable to the metric with which load is measured when determining what is necessary to meet a defined security standard. It is a metric which recognises that a larger generating unit does more to resolve a capacity constraint than a smaller generating unit. It is also likely to be a simpler metric, and less susceptible to gaming. However, it is recognised that this is a complex issue and consultation responses were invited on this point.

3.2.13 There were a number of options regarding the means by which locational capacity adequacy constraints could be represented in the auction winner determination process:

- **Option 1:** A separate capacity requirement for each constrained capacity area, *measured in MW*;
- **Option 2:** A separate capacity requirement for each constrained capacity area, *measured in units* (albeit the overall target for the whole market would still be measured in MW).
- **Option 3:** Nested capacity areas (with capacity requirements specified in MW).

3.2.14 There is a close linkage between the winner determination options and the constraint representation options. Within the CRM locational issues consultation paper (SEM-16-052) examples of this linkage were provided for each of the three options set out above.

3.2.15 Under any of these options, the capacity target (set in MWs) for the island of Ireland as a whole would be used as the target quantity in the demand curve applied to the unconstrained merit order for the purposes of clearing price determination.

¹⁶ See for instance TSO Operational Constraints update 30/09/2016 at http://www.eirgridgroup.com/site-files/library/EirGrid/OperationalConstraintsUpdateVersion2_42_September_2016.pdf

3.3 SUMMARY OF RESPONSES

Auction Format and Winner Determination

- 3.3.1 Most respondents gave an auction format preference however a sizeable number of respondents did not provide any preference as they fundamentally disagreed with the inclusion of constraints within the CRM auction and supported an unconstrained CRM auction. A small number of respondents commented that it was difficult to fully appraise the options because they were not fully described and they had to make some assumptions as to how some of them would work in practice. In summary, the most preferred options were Option B and Option E with equal support. Other responses advocated a hybrid of Option B and E, Option C or a variation, or Option C moving to Option D for the enduring auctions. No support was received for Option A.
- 3.3.2 Support for Option B was on the basis of an unconstrained auction which identifies those plants that satisfy the capacity requirement (and are awarded a Reliability Option) and this represents the plant that should remain on the system in the long run. It was recognised that Option B is likely to result in higher costs in the transitional period but the long-term advantages make it the preferable solution. It was argued that it avoids capacity market distortion i.e. removing economic winners and giving wrong market signals to capacity providers. Some favoured Option B on the grounds it was the least worst option which can be delivered on time and raised concerns that the other options represent a material change from the I-SEM High Level Design and risk distorting CRM auction competition.
- 3.3.3 Support for Option E was on the grounds of a competitive unconstrained capacity auction followed by a security of supply analysis by the TSOs to identify any remaining issues. This was viewed as not distorting the all-island capacity signal, so long as in-merit generators were not excluded, and CRM or ancillary services/DS3 contracts (of the appropriate length) are provided as necessary to resolve security of supply issues. Variations to Option E focused on the proviso that the “must-not-exit” capacity is additional capacity and does not displace any capacity. Over all the options, Option E provides a fine-tuned appraisal that all the other options need to bolt on to ensure the viability of the selected capacity meeting the locational requirements.
- 3.3.4 Those supporting Option C (unconstrained run followed by heuristic step) proposed variations such as the inclusion of all system constraints, transparent ex-ante rules for identifying must run units, outline rules obliging units to bid based on Net Going Forwards Costs and a “balancing test” to assess whether the longer-term cost of “constraining off” efficient units outweighs the cost of keeping excess capacity online. One respondent considered Option C and D as likely to offer the optimum determination of winners, however recognised for practical reasons Option C was a sensible choice for the interim period.
- 3.3.5 A hybrid of Option B and E was proposed by two respondents. Firstly, Reliability Options would be awarded to all capacity providers who clear in the unconstrained auction followed by the TSOs assessing system constraints and using the ancillary services market to resolve such constraints.

- 3.3.6 Option A was dismissed on grounds it would distort pricing and impair efficient investment. Option C and D were considered more complex and simplification of constraints could result in unanticipated and volatile outcomes. There was general concern that increasing complexity into the auction format would reduce transparency, increase subjective decisions and risk discriminating between different licence holders. Some respondents considered some of the options to be a significant change from the I-SEM High Level Design and questioned whether they would receive State Aid approval and bidding zone approval.

Capacity Clearing Price Determination

- 3.3.7 The vast majority of respondents supported Option 1 (highest-priced bid accepted in the unconstrained merit order). Some respondents emphasised that the capacity price should be set to at least this Option 1 or alternatively the capacity clearing price should be set after lumpiness constraints have been resolved. Some respondents explicitly stated that the unconstrained clearing price should set the market clearing price to avoid distorting or depressing prices impacting on future investment and potentially security of supply.
- 3.3.8 No support was received for Option 2 (the highest-priced bid which is both: (a) accepted in the unconstrained merit order; and (b) selected as a winning bid after lumpiness and locational considerations have been resolved). One respondent suggested the price of those accepted out of merit bids should set the capacity price to reflect the real cost of maintaining capacity in the constrained system. Options 1 and 2 were considered by a respondent to create the wrong bidding incentives for participants and the wrong long-term incentives for participants.

Unsuccessful In-merit Bidders

- 3.3.9 Some respondents reiterated that they do not support the concept of in-merit bidders being “constrained off”. Furthermore, if their preferred auction format design of Option B was chosen this issue of unsuccessful in-merit bidders would not arise.
- 3.3.10 Of those who responded there was general support for Option 1 (no compensation). Reasons given were to ensure appropriate entry/exit signals and that compensation alone does not give consumers a guarantee that capacity will stay on the system. Furthermore, such compensation payments would be detrimental to social welfare, as the consumer would have to pay more but not necessarily receive improved security of supply. Some viewed it better to procure the service rather than pay compensation and receive nothing in return. Option 1 was also preferred from the perspective of State Aid approval.
- 3.3.11 A small number of respondents considered “unhappy winners” should receive compensation. A couple of respondents supported Option 2 (lost profit compensation). Some viewed it better to procure the service rather than pay compensation and receive nothing in return (particularly under Option 3-pay as bid). There was also reasonable support for proposing a further option i.e. compensation based upon the unconstrained market clearing price. A small number of respondents mentioned that compensation may be necessary if plants have a legal right to firm transmission access.

Representation of Constraints

- 3.3.12 A mixed response was received to the options proposed. There was marginally more support for Option 2 (separate constrained areas in units) than for Option 3 (nested areas in MW) and Option 1 (separate constrained areas in MW). Of those respondents who commented some did not provide a preference for any of the options for a range of reasons. Some considered the representation of constraints was not appropriate for CRM or that the most appropriate or the need for any option is dependent on the auction format chosen, or alternatively more detail is required to allow further analysis to inform a preference.
- 3.3.13 Those favouring Option 2 (separate constrained areas in units) did so as this more closely matched how the TSOs currently define operational constraints and it gives the flexibility and security required by the TSOs to maintain system security. One respondent proposed a variation of Option 2 whereby a unit and MW requirement is defined for each capacity area to ensure the capacity requirement is met.
- 3.3.14 Support for Option 3 (nested areas in MW) was on the basis that the requirement is likely to be for a minimum number of MW in each location with a fixed overall total. Whereas the other options could potentially overstate the locational constraint and therefore Option 3 should lead to a more efficient solution. Furthermore, Option 3 was preferred as the use of whole unit constraints is considered inconsistent with the CRM 5-part Price Quantity (PQ) bids.
- 3.3.15 Those supporting Option 1 (separate constrained areas in MW) preferred this option as it is consistent with the capacity requirement which is also calculated in MW. However, one respondent considered Option 1 as adopting capacity zones which conflicts with the CRM single zone approach.

3.4 SEM COMMITTEE RESPONSE

Auction Format and Winner determination

- 3.4.1 As part of the consultation we indicated that Option C might be a logical interim solution. However, following further analysis, including taking account of consultation responses, the SEM Committee is of the view that:
- In the short term, Auction Format Option B should be adopted, which entails CRM Auction Format Option 1 (simple sealed bid) with any capacity secured to meet constraints being additional to that which clears in the unconstrained auction; and
 - In the longer run, Auction Format Option D (full combinatorial auction) is the optimum format.

- 3.4.2 The updated evaluation of auction format options is summarised in Table 1: Evaluation of auction format options.
- 3.4.3 The key reason for preferring Option D in the longer run is that it will generate the most efficient solution (least cost) to meeting a capacity requirement in any given auction¹⁷.

¹⁷ Including taking appropriate account of a sloping demand curve below the capacity requirement

Table 1: Evaluation of auction format options

	Key Pros	Key Cons
Option A: Ex-ante identification of “must not exit” units	<ul style="list-style-type: none"> • Easy auction system to deliver • In short run, lower customer bills than B, C, E. Possibly lower than D 	<ul style="list-style-type: none"> • Weak on competition where need X from Y in constrained area • Lacks transparency • Price set by plant outside NI and Dublin only • Complicates State Aid?
Option B. Simple sealed bid auction format, with additional units for locational capacity	<ul style="list-style-type: none"> • Strong on long run security of supply • Easy auction system to deliver • <i>Potentially lower energy market revenues</i> • Longer term CRM benefits if prevents exit of plant cost effective once constraints alleviated 	<ul style="list-style-type: none"> • Higher CRM bills, at least in short term
Option C: Simple sealed bid, heuristic second step, to manage locational constraint	<ul style="list-style-type: none"> • Lower CRM bills than B • More competition and transparency than A, E • TSOs say they can deliver for first auction 	<ul style="list-style-type: none"> • <i>Higher energy market revenues</i> • Harder systems solution to deliver than A,B,E • Weaker on security of supply than A,B, E? • May increase concentration in energy market
Option D. Full combinatorial	<ul style="list-style-type: none"> • Most efficient winner determination, long run • Lower customer bills than B, C, E 	<ul style="list-style-type: none"> • TSOs say they <u>cannot</u> deliver for first auction • Weaker on security of supply than A,B, E?
Option E: Ex-post identification of “must not exit” units	<ul style="list-style-type: none"> • Strongest on security of supply (TSO preferred): deals with unanticipated outcomes • Stronger on competition than A • Easy auction system to deliver 	<ul style="list-style-type: none"> • Weak on transparency, including CRM/ancillary service distinction • Complicates State Aid?

3.4.4 However, the SEM Committee has decided to implement Option B in the short term, at least for the first transitional auction because:

- The CRM Delivery Body advised that the IT solution for Option D cannot be guaranteed to be implemented in time to support the first transitional T-1 auction;
- Option B provides a more conservative approach to managing security of supply in a constrained system than Options C and D, and the SEM Committee is keen to ensure a managed transition between the SEM CPM and the I-SEM CRM;
- In a market with transmission related capacity constraints which are likely to be relaxed in the medium term due to new infrastructure, Options C and D, may send exit signals to plant which would be an efficient source of capacity once the capacity constraint has been relaxed.

3.4.5 We note that it is also possible that Option B could deliver a lower cost solution to Options C and D across all electricity markets (energy, capacity and ancillary services), whilst constraints persist. The RAs have modelled the potential quantitative impact of Options A to E on consumer bills in both the capacity and energy markets in the first transitional auctions. The capacity market modelling simulated the potential capacity clearing price under the different auction formats, and also the energy market outcomes if plant which did not receive a Reliability Option closed. As might be expected customer capacity bills are potentially higher under Option B, than under Options C and D, since more MW of Reliability Options are awarded and at a higher price. However, under Options C and D, some plant which is in an over-supplied capacity zone, and would not be awarded a Reliability Option under formats since it may not contribute effective additional capacity at peak times, could still act to reduce the energy price at other times. Moreover, the modelling indicated that in the short term, on the assumption that there are significant constraints on the north-south interconnector and around the Dublin area, the overall consumer bill could be lower under Option B than Options C or D, as the impact of lower energy market bills could outweigh the impact of higher capacity market bills. These results are sensitive to assumptions about the level of constraints, and in the longer run, if constraints are alleviated, Options D and C can be expected to deliver lower overall consumer bills than Option B on average.

3.4.6 Further details of the modelling results must remain confidential because:

- They are based on confidential information obtained by the RAs through regulatory reporting; and
- Revealing the results could influence how bidders bid in CRM auctions, including increasing their ability to exercise market power to the detriment of consumers.

3.4.7 However, these results represent one reason why the SEM Committee favours the adoption of Option B rather than Option C in the short term.

3.4.8 Transmission constraints can be incorporated within Option D, although this contributes to complexity in the development of the combinatorial auction platform. However, this auction format cannot be delivered for the first transitional auction. Where constraints are largely fixed, Option D can be expected to deliver the optimum combined CRM solution to both the

transmission constraint and lumpiness problem. However, where constraints are transitory, Option D may send a short-term exit signal to some capacity which could be an efficient medium to long term solution. In the medium to long term it is envisaged that the main locational capacity delivery constraints will be alleviated, and Option D will provide the most efficient winner determination. However, we leave open the possibility that we may incorporate locational constraints into Option D, if constraints persist.

- 3.4.9 Option A is not favoured, even as a transitional solution, because it would result in a large proportion of capacity being taken out of the market ex ante, i.e. it would deliver at best a semi-market based solution. Capacity price for Ireland and Northern Ireland could well end up being determined by competition between plants based in Ireland outside the Dublin area.
- 3.4.10 Option E is not being pursued as it raises concerns associated with a lack of transparency, particularly where Option E is used to solve both ancillary service and capacity requirements. There is a concern that decisions would be taken ex post, which would decide plant was awarded a Reliability Option. The TSOs have not demonstrated how criteria could be developed ex ante, which would allow transparent application of the rules, and for instance, allow an auction auditor / monitor to attest that the rules had been applied fairly, and to independently validate the results.

Capacity Clearing Price Determination

- 3.4.11 There is broad agreement with the majority of respondents that it is more appropriate to implement Option 1, the highest-priced bid in-merit in the unconstrained merit order.
- 3.4.12 The choice of Auction Format Option B (at least in the short term), reduces the impact of locational constraints on the clearing price, and reduces the potential differences between Options 1 and 2¹⁸. However, Option 2 could still have a significant impact in depressing the price below the marginal cost of capacity, where the marginal unit is inflexible. For this reason, Option 1 sends a better long term capacity price signal, and the SEM Committee has decided to adopt it.
- 3.4.13 By potentially depressing the capacity price below the long run marginal cost, Option 2 could result in lower customer bills in any given auction. However, it is likely that this pricing approach would be reflected in bids over the longer term and would not necessarily deliver a better outcome for customers. Table 3 below shows an evaluation of each of the capacity clearing price options.

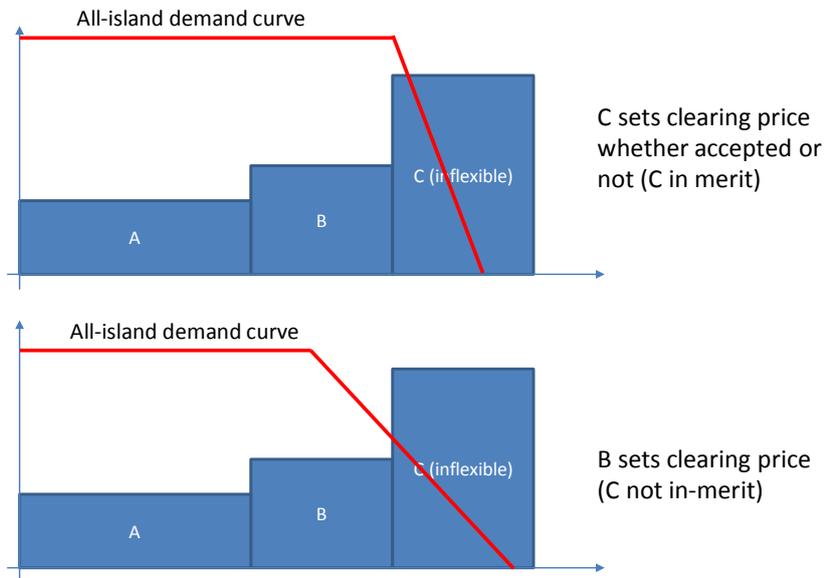
¹⁸ Because Option B removes the possibility of multiple marginal units being rejected for locational reasons (which can occur in Options C and D), reducing the clearing price.

Table 1: Evaluation of clearing price options

	Key Pros	Key Cons
Option 1: highest-priced bid accepted in the unconstrained merit order	<ul style="list-style-type: none"> Capacity price better approximation to the LRMC of capacity, so more efficient investment price signal Strong incentives for truthful bidding for most bidders 	<ul style="list-style-type: none"> Higher customer bills Some gaming opportunities for bidders who are “constrained-off”, but think that they may set the unconstrained market price
Option 2: highest-priced bid which is both: (a) accepted in the unconstrained merit order; and (b) selected as a <i>winning bid</i> after lumpiness and locational considerations	<ul style="list-style-type: none"> Lower customer bills Gaming opportunities for bidders who are infra-marginal in unconstrained run 	<ul style="list-style-type: none"> Price downward biased

The clearing price determination under Option 1 is further clarified in Figure 1: Clearing price decision.

Figure 1: Clearing price decision



3.4.14 The SEM Committee does not agree with those who argue that the clearing price should be any higher than the highest in-merit bid. There is no economic justification for reflecting the price of any out-of-merit bids accepted for constraint reasons in the clearing price.

Unsuccessful In-merit Bidders

- 3.4.15 The proposal to implement Auction Format Option B means that, at least in the short term, it is not possible for a bidder to be rejected for locational constraint reasons- this only applies if Auction Format Option C or D. Therefore, in the short term, the issue of unsuccessful in-merit bidders only potentially applies to a marginal bidder rejected for inflexibility reasons.
- 3.4.16 The SEM Committee has decided in favour of Option 1: No compensation since:
- **Efficiency:** Options 2 and 3 consulted upon may result merely in a deadweight payment to the bidder with no efficiency benefits, since it does not guarantee that a capacity provider can recover its Net Going Forward Costs (NGFC), and may have enough revenue to remain operational. In the case of Option 3, an inflexible generator would only earn payment on the proportion of its capacity which is in merit- and by virtue of declaring itself inflexible it has indicated that this revenue is not sufficient to justify continued operation. In the case of option 2, the payment it is not necessarily sufficient to cover NGFCs even on that proportion of the capacity which is in-merit.
 - **Fairness:** any rejected partially in-merit bidders had the choice to bid flexible, and must accept the consequences of an inflexible bid.

Representation of Constraints

- 3.4.17 The SEM Committee is of the view that Option 3: Nested capacity areas (with capacity requirements specified in MW) is the most appropriate representation of constraints. For example, suppose in the first transitional auction there are two zones where there is potentially insufficient capacity, Northern Ireland and the Dublin area. This would mean that we would specify a separate minimum MW requirement for Northern Ireland and for the Dublin area together with a Capacity Requirement and demand curve specified for the island as a whole.
- 3.4.18 By contrast under Option 1, we would also specify the requirement for the “rest of Ireland” i.e. the island of Ireland excluding the Dublin area and Northern Ireland, such that the sum of the requirements for Dublin, Northern Ireland and “rest of Ireland” equalled the all-island Capacity Requirement. **Option 3 delivers a potentially more efficient solution**, since if (possibly contrary to expectations), there is more than the minimum in-merit generation in either Dublin or Northern Ireland, this capacity can help to meet the requirements for the whole island, and hence by inference the “rest of Ireland” area. Option 3 is also consistent with the way that zonal requirements are represented in zonal capacity markets, such as US capacity markets.
- 3.4.19 Option 3 is preferred to Option 2 since it is MW of capacity that are required to meet the capacity standard. It is recognised that the reliability standard may not be met if, in a constrained zone that capacity is provided by a very small number of units. However, the TSOs, in their response, are of the view that at the moment, they are content with an approach based upon MW. The constraints would be published prior to each auction. It will be necessary to set out the definition of the nested areas, and the minimum MW required in

each area prior to the auction. We envisage that, for the first transitional auction, indicative information on constraints would be published during or before the Auction Qualification window, but that the precise definition of constraints and minimum MW requirement may need to be updated as a result of information gained during the Qualification process.

3.5 SEM COMMITTEE DECISIONS

3.5.1 Auction format and winner determination:

- In the short term, the SEM Committee has decided to adopt Auction Format Option B, which entails CRM Auction Format Option 1 (simple sealed bid) with any capacity secured to meet constraints being additional to that which clears in the unconstrained auction. Option B shall apply to all transitional, T-4 and T-1 auctions until such time as the SEM Committee instructs the CRM Delivery Body to implement Option D. The decision on whether to include any marginal inflexible unit, alternative higher priced bids or neither on “lumpiness” grounds (a decision which will be made based on net social welfare as set out in SEM-16-039) will be made after any bids awarded pay-as-bid Reliability Options to meet locational constraints have been selected, and the additional capacity selected for locational reasons will be taken into account in the net social welfare calculation.
- In the longer run, the SEM Committee intends to implement Auction Format Option D.
- The SEM Committee shall give market participants reasonable notice of any move to implement the Option D format. For instance, the SEM Committee will not instruct the CRM Delivery Body to implement Option D in respect of a particular auction after the Qualification Window for that auction has shut.
- For the avoidance of doubt, if the marginal bidder in the unconstrained schedule is inflexible, the CRM Delivery Body will still be required to apply the social welfare test to determine whether to accept the marginal bid in its entirety, accept additional¹⁹ out-of-merit bids instead, or reject all marginal and out-of-merit bids (i.e. apply Lumpiness Option 3c as decided in SEM-16-039). However, the calculation of social welfare will need to take into account the impact on social welfare of these choices, taking account of any additional capacity awarded Reliability Options for locational reasons, with social welfare evaluated against the all-island demand curve.

¹⁹ Additional to those already accepted to meet the locational constraint

- 3.5.2 **Capacity clearing price determination:** The SEM Committee has decided to implement **Option 1:** The highest-priced bid accepted in the unconstrained merit order. Therefore, if the marginal bid in the unconstrained merit order is not accepted for inflexibility reasons, its price will set the clearing price.
- 3.5.3 **Compensation:** The SEM Committee has decided to implement **Option 1:** No compensation.
- 3.5.4 **Representation of Constraints:** The SEM Committee has decided to implement **Option 3:** Nested capacity areas (with capacity requirements specified in MW).

4 LONGER TERM CONSIDERATIONS

4.1 INTRODUCTION

- 4.1.1 As part of the development of the CRM design the SEM Committee have recognised that locational considerations should be taken into account for the efficient management of exit and entry of capacity resources.
- 4.1.2 The purpose of this section is to consider whether the inclusion of locational capacity delivery constraints in the CRM would occur in T-1 auctions, T-4 auctions, or both.

4.2 CONSULTATION SUMMARY

- 4.2.1 To the extent that locational capacity delivery constraints are applicable in the CRM, these are expected to be applicable to at least the T-1 auctions. If locational capacity delivery constraints bind in the T-1 timeframe (i.e. if constraints are identified which will bind one year ahead) then few tools are at the disposal of the TSOs and the market in general to ensure capacity adequacy other than to ensure that necessary generating units in capacity-constrained locations do not close prematurely because of timelines to build new generation or transmission.
- 4.2.2 The T-4 timeframe presents a potentially different situation however. If constraints are identified which will bind four years ahead then there may be sufficient lead time to explore other options, as alternatives to explicitly placing locational capacity delivery constraints in a single capacity zone T-4 auction. These other options, designed to address enduring locational issues, could involve further modifications to the market arrangements, and/or they could involve TSO-led transmission initiatives.
- 4.2.3 Separately, there is an issue related to the *timing* of T-1 and T-4 auctions. During the transition period, there will generally be two auctions per year, one T-1 and one T-4, both for close to the full system requirements. After the transition, there will still be two auctions per year, albeit the size of the T-1 auction will fall, as it will only be used to secure residual requirements. Therefore, there is the potential for some complexity and/or inconsistency, at least in the transitional period, if the T-1 auctions accommodated locational capacity delivery constraints and the T-4 auctions did not.
- 4.2.4 There were a number of options considered specifically in relation to locational capacity delivery constraints within the CRM T-4 auctions:
- **Option 1 (Constraints in T-4):** *Do* apply locational capacity delivery constraints in the CRM for the initial and enduring T-4 auctions.
 - **Option 2 (No constraints in T-4):** *Do not* apply locational capacity delivery constraints in the CRM for the T-4 auctions.
 - **Option 3 (Constraints in T-4 on transitional basis only):** *Do* apply locational capacity delivery constraints in the CRM for the T-4 auctions, but transition them out over time.

- 4.2.5 A factor to consider in the evaluation of these options is that, given that the *first* T-4 auction will occur *after* the first T-1 auction, it may be desirable to defer a decision on the nature of T-4 auctions until after learnings have been obtained from that first T-1 auction. The key learning would of course be the extent of binding constraints, and the extent of any system security consequences associated with the winning set of bids.
- 4.2.6 Wider considerations of locational capacity delivery constraints may separately *result* in:
- A review of GTUoS locational price signals to strengthen signals for plant entry and exit;
 - Interactions with transmission build by TSOs, such that the most efficient means of solving locational constraints is delivered for consumers.
- 4.2.7 In addition to the proposals described above, if constraints are enduring and are expected to continue to bind on a more persistent basis, consideration will need to be given as to whether it is desirable and appropriate to establish more than one capacity zone. This would need to be considered in the context of the bidding zone review process under the Capacity Allocation and Congestion Management (CACM) Regulation.

4.3 SUMMARY OF RESPONSES

- 4.3.1 Views were sought as to the inclusion of locational capacity delivery constraints within CRM T-1 auctions, T-4 auctions, or both. Responses were also sought in relation to the criteria for T-4 auctions being conducted without explicit consideration of locational capacity delivery constraints together with further considerations to take account of the longer-term management of locational capacity delivery constraints.
- 4.3.2 The majority of those who gave a preference supported the inclusion of capacity delivery constraints within both the T-1 and T-4 auctions. However, quite a number of respondents did not want locational capacity delivery constraints within either auction, with some particularly concerned with the inclusion within the T-4 auction. A couple of respondents supported the inclusion of locational capacity delivery constraints within the T-1 transitional auctions only.
- 4.3.3 Those supporting the inclusion within both T-1 and T-4 auctions were concerned that T-4 capacity might not otherwise be procured in a location where it is required, saying it provided locational signals for new build and was considered the most appropriate approach to achieve the lowest cost outcome.
- 4.3.4 Respondents supporting inclusion only within the T-1 transitional auctions have serious concerns that a generation solution to constraints would be accepted without testing whether transmission solutions would deliver greater economic benefit to the consumer. Potentially a

10-year contract could be awarded 4 years in advance of the capacity delivery year in order to solve a constraint which may fall away during this 14-year period.

4.3.5 Concern was raised that a multi-year capacity Reliability Option would be awarded on the basis of location rather than price and therefore it does not meet a simple efficiency or competition test. Another response considered if the capacity market is to account for locational constraints it should only account for those short-term and unpredictable/unmanageable constraints that arise from time to time. Furthermore, a respondent considered that the decision on the treatment of locational constraints in T-4 and enduring T-1 auctions should be the subject of a specific consultation, potentially after the first transitional auction has taken place.

4.3.6 Respondents were asked what circumstances or criteria should be considered should the T-4 auctions be conducted without explicit consideration of locational capacity delivery constraints. Some referred to their preferred auction format design as significantly reducing the complexity of locational issues in T-4 auctions i.e. Option E or a hybrid of Options B and E²⁰. Ignoring locational issues in the T-4 auctions means all the constraints would need to be addressed in the T-1 auction, for which the enduring T-1 auctions will have very limited capacity perhaps the equivalent of one large unit, potentially leading to a number of short notice contracts for plants that were on a closure maintenance regime.

4.3.7 Regarding the longer-term management of locational capacity delivery constraints respondents considered a range of possibilities. For example:

- locational constraints are a system issue and the CRM should be complimented by TSOs analysis (in conjunction with the Ten Year National Development Plan) of identifying cheaper solutions to CRM Reliability Options such as reinforcing the networks or bi-lateral contracts e.g. ancillary services;
- a CRM approach which will automatically and fairly adjust for medium to longer term investments delivered by transmission upgrades, new entrants, DSUs and technological advancements;
- in light of locational proposals, the Regulatory Authorities should reconsider the glide path option of transitioning from the current CPM to the delivery year of the first T-4 auction at which point the North-South constraint will be resolved;
- keep TUoS tariffs under review, strengthen GTUoS signals and also strengthen TLAF signals so as to influence participation in the CRM.

²⁰ Option B auction format: Unconstrained run with capacity secured to meet constraints being additional
Option E auction format: Unconstrained run followed by TSO system security analysis to identify must-not exit units

4.4 SEM COMMITTEE RESPONSE

- 4.4.1 By the time of the first T-4 auction, we will have a better understanding of the likely impact of transmission constraints on the CRM. In particular:
- We are currently having to define key CRM policies before the TSOs have been able to complete a comprehensive quantitative analysis of potential transmission constraints;
 - We will know who the winners and losers are from the first transitional auctions, and where they are located; and
 - We will have learnt any lessons from the transitional auction.
- 4.4.2 By the time of the first T-4 auction we will have more information on these factors, and more information about the progress of key planned transmission reinforcement such as the North-South upgrade. The SEM Committee therefore intends to defer a decision on whether locational constraints will be included in T-4 auctions until a later date.
- 4.4.3 Like many respondents, the SEM Committee would be concerned at committing to longer term Reliability Options in transmission constrained zones, where transmission constraints could be transitory. This point is further addressed in Section 5.
- 4.4.4 The SEM Committee shares the views expressed by a number of respondents who variously argued that the TSOs should analyse whether there are cheaper solutions than paying out-of-merit capacity providers, such as transmission reinforcement. However, the SEM Committee notes that:
- Money is not the only factor constraining transmission investment. The RAs are happy to approve investment which yields a net welfare benefit to consumers, but investment approval is not the only factor constraining investment. For instance, planning approval may also constrain investment;
 - At this point in time, it is not clear to what extent that transmission investment can sufficiently alleviate key constraints on capacity deliverability in time for the first T-4 auction.
- 4.4.5 To some extent a T-4 auction, unlike the transitional auctions, does not need to deliver a complete solution to locational issues. This is because it envisaged that a T-4 auctions will be accompanied by a later T-1 auction, which has the opportunity to adjust for requirements not fully met in the T-4 auction. These unmet requirements are expected to include change in demand forecasts, but could include correcting for locational issues not addressed in T-4 auctions. However, given that T-4 auctions are expected to cover at least 95% of forecast demand, the scope to correct for transmission constraints in T-1 without imposing extra cost on consumers may be limited. Furthermore a key objective of reserving some capacity for T-1 auctions is to allow DSUs to compete more effectively. If capacity reserved for T-1 auctions has to be reserved for only certain locations, this may complicate the objective of maximising the involvement of environmental friendly demand reduction.

4.4.6 The SEM Committee also agrees with a number of respondents who argue that it is appropriate to review locational signals (GTUoS and TLAFs) which may provide at least partial solutions to the handling of transmission constraints in T-4 auctions. However, it is not clear to what extent it will be possible to complete a full review of locational signals sufficiently prior to the first T-4 auction to ensure that they will provide a complete solution to constraints in the CRM.

4.4.7 It is important that longer term locational constraints are addressed and to ensure the most efficient means of solving these constraints is sought for the benefit of consumers. This requires the continued assessment of network investment and any other actions by the TSOs which could lead to cheaper alternatives to the inclusion of constraints within the CRM auctions.

4.4.8 Overall, the SEM Committee is of the view that:

- At this time, we cannot be sure to what extent we can be sufficiently confident that transmission constraints will be alleviated prior to the first T-4 auction that there will be no requirement to reflect transmission constraints in the first T-4 auction. **We will therefore require the T-4 auction system (including one that implements Auction Format Option D) to be capable of handling transmission constraints.**
- However, before making a decision to implement them in the first T-4 auction, we would propose to consult again on the pros and cons of including them in that auction, at a time closer to the first T-4 auction, when more is known about the scale of plant exit, and more information is known on progress in reviewing locational signals, and in reinforcing the transmission system.

4.5 SEM COMMITTEE DECISIONS

4.5.1 The SEM Committee has decided that:

- **We will require the T-4 auction system (including one that implements Auction Format Option D) to be capable of handling transmission constraints.**

Before making a decision to implement them in the first T-4 auction, we would propose to consult again on the pros and cons of including them in that auction, at a time closer to the first T-4 auction.

5 LOCAL SECURITY OF SUPPLY AND MARKET POWER

5.1 INTRODUCTION

5.1.1 In CRM Decision 3 (SEM-16-039) the SEM Committee set out its range of measures to mitigate market power in the CRM auctions. The framework of market power controls was comprehensive, and in addition to mandatory bidding (addressed in CRM Decision 1) included:

- An Auction Price Cap, to apply to all bidders, including new build plant;
- A Price-taker Offer Cap (now called the Existing Capacity Price Cap) which would apply to all existing generators. This Existing Capacity Price Cap would generally be uniform, but individual generators could bid to be allowed to have a higher unit specific price cap on the grounds of higher Net Going Forward Costs;
- A sloping demand curve, which would also serve to mitigate market power.

5.1.2 Whilst this framework is comprehensive, with controls on all generators, it:

- Assessed market power on an all-island basis, without reference to transmission constraints; and
- Did not consider certain specific issues arising from the interaction of solutions to address local capacity requirements.

5.1.3 Further consultation was necessary to explore whether the CRM framework as currently designed is sufficient to mitigate any additional issues that arise as a result of local security of supply, or whether additional controls are required.

5.2 CONSULTATION SUMMARY

5.2.1 The consultation explored additional market power issues from both the perspective of existing plant and also new plant.

Additional Market Power Issues – Existing Plants

5.2.2 The application of an Existing Capacity Price Cap to all existing generators set out in CRM Decision 3 (SEM-16-039) goes a long way towards mitigating the market power of all generators in the capacity market. The SEM Committee will only allow it to bid above the Existing Capacity Price Cap where it is able to demonstrate that its bid reflects its Net Going Forward Costs.

5.2.3 It is envisaged that the Existing Capacity Price Cap will be higher than the Net Going Forward Costs of the majority of plant on the system. However, a consequence of the local security of

supply requirement is a consideration of whether there is greater potential for a generator required for local security of supply to exercise market power up to the Existing Capacity Price Cap.

- 5.2.4 Where a generator has local market power due to the constraints, it has an increased ability to bid up to the Existing Capacity Price Cap (formerly Uniform Price-taker Offer Cap) and be accepted out-of-merit, even in a market with significant over-supply at an all-island level. If it has local market power, its bids are not as effectively constrained by competitive pressure as they are elsewhere on the island.
- 5.2.5 The SEM Committee sought feedback from stakeholders on this point and also considered further bid restrictions on any plant required for local security of supply reasons such as:
- At its individual Net Going Forward Cost, i.e. below the Existing Capacity Price Cap (Uniform Price-taker Offer Cap) if its individual Net Going Forward Costs are lower than the Existing Capacity Price Cap; or
 - At the Existing Capacity Price Cap adjusted for any specific ancillary service payment it may receive; or
 - Any individual plant could be required to have an evaluation of its Net Going Forward Costs due to fear of economic or physical withholding, at the discretion of the SEM Committee.

Additional Market Power Issues – New Build

- 5.2.6 Separate locational market power issues relate to new plant. Partly this is due to not all of the market power mitigation mechanisms within CRM Decision 3 applying to new plant e.g. mandatory bidding and the Existing Capacity Price Cap.
- 5.2.7 The existence of locational constraints would tend to make the CRM auction less competitive because the effective market within each constrained area would be smaller and thus more highly concentrated. Of particular concern is the situation where a long-term pay-as-bid capacity contract could be awarded to a new plant in a constrained location under conditions that were less than competitive.
- 5.2.8 Further exacerbating the market power issue is the fact that new plant can have a very different competitive dynamic compared to existing plant due to:
- A new plant can obtain a contract of up to 10 years, existing plant can only obtain a contract for one year;
 - Prospective new plants are in practice likely to face considerable barriers to entry, compared to existing plant;

- The “market” as it applies to new plants is inherently less competitive than for existing plants because new plants face costs and risks of entry that have already been sunk in the case of existing plants.

5.2.9 The consultation paper considered what a possible “market power strategy” a prospective new entrant in a constrained location might look like:

- One possibility is that an existing generator might specify that a plant will close (T-4 timeframe) and then bid in a new plant to the T-4 auction. The bid for the new plant might be a high price, as long as the price is at or below the overall Auction Price Cap;
- Another possibility is that a new entrant bidding in a constrained area might simply offer a high price and thereby take advantage of the lack of competitiveness in the area to obtain a high-price multi-year contract.

5.2.10 The SEM Committee recognised this is a difficult issue and in a wider context transmission solutions should not be left unconsidered in the event that multi-year pay-as-bid new plant bids would otherwise be accepted in a CRM auction (either T-1 or T-4), i.e. before accepting such bids for a constrained location it is reasonable to confirm first that a transmission solution to relieve the constraint would not have been a lower cost solution for consumers.

5.3 SUMMARY OF RESPONSES

5.3.1 Views were sought on whether the suite of market power controls set out in CRM Decision 3 (SEM-16-039) are sufficient to address any additional market power issues raised by local security of supply considerations.

5.3.2 Most respondents were of the view that additional market power controls are required should locational constraints be incorporated into the CRM design. A couple of respondents considered the suite of market power controls within CRM Decision 3 to be sufficient. One respondent considered the mitigation measures appropriate for T-1 auctions but additional mitigation measures are required for the T-4 auction.

5.3.3 General views include the need to publish locational constraints prior to the auction, while recognising this may provide a market power advantage to certain generators it ensures scrutiny can be applied to those specific units. Units within constrained zones can afford to bid differently with two ways to win a Reliability Option i.e. a competitive bid or out-of-merit ‘must run’ status. When multiple units within these zones are under the same ownership, then gaming strategies need to be prevented. Furthermore, the controls do not prevent

predatory bidding in highly concentrated local markets and offer no protection against non-commercial incentives.

- 5.3.4 CRM is being designed for a single zone capacity market, and therefore the market power controls set out to date cannot resolve local market power issues and these respondents conclude this is another reason that CRM should not incorporate locational capacity constraints.

Additional Market Power Issues – Existing Plants

- 5.3.5 A number of respondents had concerns with limiting bids at Net Going Forward Costs below the Existing Capacity Price Cap (formerly Uniform Price-taker Offer Cap) viewing the Existing Capacity Price Cap as giving the Regulatory Authorities sufficient discretion to mitigate market power potential. It is difficult to limit such bids due to estimation of cost accuracy and it is a short-term view giving uncertain messages about future costs and revenues which may inadvertently lead to inefficient closures. Concern was raised if in-merit plant is subjected to individual Net Going Forward Costs and as a result is not able to capture the margin between this price and the CRM clearing price meaning plant are not allowed to earn revenues that may contribute to the sunk costs of efficient investment and this may also lead to inefficient closure. Setting such a regulated price for capacity for some units may be discriminatory. For some it was difficult to comment on the appropriateness of Net Going Forward costs as the detail of how this is to be determined has not yet been discussed. A bidding code of principles to define Net Going Forward Costs was requested by another respondent.
- 5.3.6 Some respondents supported out-of-merit ‘must run’ Reliability Options being awarded at their Net Going Forward Costs rather than based upon bid. In their view, such a Reliability Option should only be awarded after costing alternative feasible transmission reinforcement plans.
- 5.3.7 Additional mitigation measures were considered necessary to avoid such ‘must not exit’ plant from simply bidding at the Existing Capacity Price Cap (or Auction Price Cap for new entry). Capping bids at their Net Going Forward Costs would likely require an unacceptable level of regulatory intervention in the capacity market e.g. all unit in Northern Ireland may need to submit their costs for approval.
- 5.3.8 To reduce the number of Regulatory Authorities assessments a respondent proposed the assessment took place after the auction for those identified as out-of-merit must run and awarded a Reliability Option on a pay-as-cost rather than pay-as-bid basis. In other words, only successful out-of-merit must run bidders have to submit their Net Going Forward Costs for approval.

- 5.3.9 A proposal was put forward by a respondent on the principle that all bids must be consistent with a bidder's Net Going Forward Costs. The Regulatory Authorities should examine bids for any indication of potential market power abuse, and if they are not satisfied, that bid should be excluded from determining the clearing price thus tying bidding behaviour to regulated settlement of Net Going Forward Costs.
- 5.3.10 One respondent raised concern regarding the ability of successful competitive or out-of-merit bidders in constrained zones to secondary trade Reliability Options at the risk of breaching the constraint zone requirements.
- 5.3.11 A small number of respondents shared the concern set out in the consultation paper that a new entrant, within a constrained area, may receive a long-term pay-as-bid Reliability Option in a potentially uncompetitive process.

5.4 SEM COMMITTEE RESPONSE

- 5.4.1 The SEM Committee recognises that constraints may confer additional market power on generators, including both new build capacity and existing capacity. The issues are slightly different, but both are a potential source of concern.

Market power and new build

- 5.4.2 There is a concern that the presence of constraints could create conditions where new entry could exploit limited competition in the constrained zones to gain a high priced 10-year contract, particularly in the transitional auctions. Therefore, additional controls are necessary to restrict such high-priced long term contracts.
- 5.4.3 Suppose that there is a constrained zone in which it is clear that the minimum MW requirement means that all existing capacity is pivotal (unless there is new entry). There are two distinct concerns:
- New generators can exploit the additional market power conferred on them by the presence of transmission constraints, to obtain high-priced 10-year Reliability Options;
 - The presence of the constraint introduces additional gaming opportunities associated with plant retiral.
- 5.4.4 Neither of these issues are unique to T-1 / transitional auctions, nor to auctions in which transmission constraints are represented, but in constrained transitional auctions both the

short time lag and geographic constraints on competition combine to exacerbate the potential for market power exploitation.

New generators obtaining high priced 10-year Reliability Options

5.4.5 Consider the following example. Suppose that in the first transitional auction:

- The Existing Capacity Price Cap (ECPC) is set at €40/kW (approximately the indicative value set out in the CRM Parameters consultation paper, SEM-16-073), and the Auction Price Cap was set at 1.5 x net CONE, e.g. €116/kW p.a. (approximately the indicative value set out in SEM-16-073)
- There is a short-term transmission constraint that is expected to be alleviated within two years by transmission system reinforcement, but must be managed in the interim period.
- All existing capacity in that constrained zone is pivotal in the first auction.
- An existing generator in the constrained zone has a Net Going Forward Costs (NGFC) of €100/kW p.a., and obtains clearance to submit a bid at €100/kW²¹.

5.4.6 Without further controls, a New Build capacity provider which can enter the market at short notice in the constrained zone could bid at up to €99.99/kW p.a. and obtain a 10-year Reliability Option at that price. The New Build plant owner could even be the owner of the plant that has received approval to bid at €100/kW, so know that it can bid at €99.99/kW p.a. In this example, consumers would probably be better served by awarding a 1-year €100/kW p.a. Reliability Option to an existing generator in the first auction, and having a more competitive auction later once the constraint had been alleviated, than awarding a 10-year €99/kW p.a. Reliability Option.

5.4.7 The fact that there are likely to be limited sites available in the constrained zone, and few technologies that can enter at short notice means that competition is much more limited than in an unconstrained auction or a T-4 auction.

5.4.8 This concern is a real one, not just a theoretical one. We would be concerned if a number of small portable generators that can be quickly installed (e.g. similar to the type that have won recent GB auctions) were to use this opportunity to obtain long-term high priced contracts.

5.4.9 Since committing to longer term higher price pay-as-bid contracts could commit customers to paying for longer term locational capacity when cheaper transmission investment solutions may be available, we would not propose to allow any capacity provider to obtain a pay-as-bid Reliability Option for more than 1 year. That means that a New Build capacity provider in the transitional auctions would only be able to obtain a multi-year Reliability Option if it had been

²¹ The market power framework set out in SEM-16-039 allows generators to obtain a unit specific bid limit in excess of the ECPC, up to the value of its demonstrated Net Going Forward Costs (NGFC).

in-merit in the unconstrained run, i.e. it would have won the auction, even if there were no transmission constraints.

- 5.4.10 There are further potential gaming opportunities where the owner of the New Build plant and the owner of the existing plant are the same. For instance, the owner of the existing plant may be tempted to close the existing plant rather than bid at its NGFC in order to free up its existing connection for its new plant and use the narrow window of the transmission constraint to obtain a longer-term high priced Reliability Option. This potential gaming risk is another reason not to relax the Grid Codes requirement for generators greater than 50MW to give three years of notice of intention to close. In the above example, the SEM Committee would be prepared to ensure that the existing generator could finance its NGFC consistent with its statutory duty to allow licensees to meet their financing requirements, but would not allow it to game the system by closing the existing plant to obtain a 10-year contract on new build plant.
- 5.4.11 At this stage, the policy decision not to allow multi-year pay-as-bid Reliability Options would only apply to the transitional auctions. If at any future point in time, a transmission constraint was incorporated in a T-4 auction, we would consider separately whether a New Build generator in the T-4 auction would be eligible for a multi-year pay-as-bid contract. In that case, considerations would be different since:
- There is more scope for competition from a wider range of technologies in the T-4 auction;
 - The fact that the constraint was incorporated in the T-4 auction would be recognition that the constraint was less transitory.
- 5.4.12 There may need to be some exceptions to the rule that a New Build capacity provider cannot get a multi-year Reliability Option in a transitional auction, if there is no other way that the minimum capacity requirement in a constrained zone can be met. For instance, suppose in the above example, the existing plant was no longer able to continue supporting security of supply (e.g. because of a permanent failure of a plant), and new build capacity was necessary to ensure local security of supply. If the best new entrant needed to obtain a 10-year Reliability Option at Net CONE (indicatively around €78/kW p.a. in SEM-16-073), to justify new investment, but the all-island unconstrained clearing price was around the ECPC at 0.5 x Net CONE we may need to accommodate some form of longer term higher priced contract. Should such circumstances arise, we will consider appropriate arrangements on a case by case basis.

Market power and existing plant

5.4.13 An extensive suite of market power controls measures was set out in CRM Decision 3 (SEM-16-039), and the proposed level of those controls in quantitative terms is being discussed in the CRM Parameters consultation (SEM-16-073).

5.4.14 Having given further consideration to whether to apply further controls to existing generators in constrained zones, the SEM Committee has decided that it is not necessary at this stage because:

- Given what we are proposing in the CRM Parameters paper (SEM-16-073) for the ECPC, the scope for an existing generator to use its market power to increase prices in constrained zones will be limited. As set out in SEM-16-073, we are planning to set the ECPC at around 0.5 x Net CONE, well below the expected long run marginal cost of capacity. Therefore, a generator with local market power behind a transmission constraint will only be able to drive the clearing price up to 0.5 x Net CONE, without having its bid scrutinised anyway. The estimate of 0.5 x net CONE has been pitched at a level where we would expect an unconstrained auction to clear, if market participants bid at cost- i.e. at around a competitive market outcome. This imposes sufficient limits on the ability of any generator to exert local market power behind a transmission constraint;
- It is considered unlikely that any existing capacity providers in constrained zones will use their market power to engage in predatory pricing, deliberately bidding low into a CRM auction. Since the all-island clearing price is set on an unconstrained basis, a bidder in a constrained zone has no more ability to influence clearing prices (or pay-as-bid prices) as a result of the inclusion of transmission constraints in the CRM. Predatory pricing in general was discussed in more detail in CRM Decision 3 (SEM-16-039), and the rationale why we do not need to include specific remedies (such as bid floors), over and above normal competition law provisions was set out in full in that document; and
- Given the current indication that constrained zones could well include the Dublin area and all of Northern Ireland, adopting an approach of scrutinising individual NGFCs could lead to a heavy administrative burden on both the RAs and the industry for little if any benefit to the consumer. Even if *de-minimis* limits are applied so that each small generator in the constrained area do not have to have their unit by unit costs scrutinised, there are at least 6 significantly sized units in the Dublin area²² and 15 in Northern Ireland.

5.4.15 Our evaluation of options set out in the consultation document is set out in Table 3: Evaluation of additional market power controls on existing generators below.

²² The definition of the “Dublin area” is yet to be determined

Table 3: Evaluation of additional market power controls on existing generators

Option		Pros	Cons
Default	No further controls beyond applicable to all existing generators	<ul style="list-style-type: none"> • If auction clears at ECPC = 0.5 x Net CONE price not excessive (bids above ECPC will be scrutinized anyway) • Significant chance that will not make much if any difference to clearing price-cost based bids expected to resulting in clearing close to ECPC anyway • Lower admin burden 	<ul style="list-style-type: none"> • May result in higher price
1	At its individual NGFC, i.e. below ECPC if individual NGFC lower	<ul style="list-style-type: none"> • Could result in lower cost 	<ul style="list-style-type: none"> • Significant extra admin burden (likely to apply to at least 6 units in Dublin and 15 in NI, even with <i>de-minimis</i> MW limits)
2	At the ECPC adjusted for any specific ancillary service payment it may receive	<ul style="list-style-type: none"> • Controls market power across both ancillary services and CRM 	<ul style="list-style-type: none"> • Significant extra admin burden • Don't necessarily know ex ante what ancillary service payments will be • Should be setting ancillary service value at appropriate level
3	Could be required to have an evaluation of its NGFC at discretion of SEMC	<ul style="list-style-type: none"> • Lower admin burden than options 1,2 	<ul style="list-style-type: none"> • Higher admin burden than default • May appear arbitrary who is evaluated

5.5 SEM COMMITTEE DECISIONS

5.5.1 The SEM Committee has made the following decisions with respect to new capacity providers:

- The SEM Committee has decided that **New Build plant will only be able to get a Reliability Option of more than 1 year duration in the transitional auctions, if it is in-merit in the unconstrained auction**, i.e. if its bid price is less than or equal to the clearing price. This provision will apply to any category of capacity that meets the New Build criteria including DSUs, storage etc.
- **Exceptions may be made on a case-by-case basis if the minimum requirement in a nested zone cannot be met any other way.** However, where a New Build capacity provider has bid above the clearing price, and the minimum requirement can be met by awarding 1 year contracts to existing capacity in a nested with a higher priced bid, preference will be given to the existing capacity which only requires a 1 year contract.

5.5.2 The SEM Committee has decided not to apply any additional ex ante controls on the market power of existing capacity providers at this time as a result of the incorporation of transmission constraints. The SEM Committee may choose to review this position, if there is a material change to the Existing Capacity Price Cap level.

6 NEXT STEPS

- 6.1.1 A CRM parameters consultation paper (SEM-16-073) was published in November 2016 and closes on 21 December 2016. A decision on this is expected in March 2017.
- 6.1.2 Further consultation will take place in advance of the first T-4 auction in respect to the inclusion of locational constraints within the T-4 auctions.
- 6.1.3 The Capacity Market Code has been progressing through the TSOs Rules Working Group and is due to consultation by the Regulatory Authorities in Quarter 1 2017. Relevant decisions contained in this paper will be included in this process.
- 6.1.4 All the above papers will be published on the SEM Committee website:
www.semcommittee.com
- 6.1.5 The RAs are currently working with the TSOs to determine which constraints should be included for the first transitional auction, and the definition of the constrained zones and the minimum requirements in each zone. This information will be communicated to bidders in relevant auction documents (e.g. Auction Information Packs) and the details of the timelines and contents of the communication will be consulted upon in the Capacity Market Code.

7 ACRONYMS

ACPS	Annual Capacity Payment Sum
ASP	Administered Scarcity Price
BNE	Best New Entrant
CACM	Capacity Allocation and Congestion Management
CCGT	Combined Cycle Gas Turbine
CPM	Capacity Payments Mechanism
CRM	Capacity Remuneration Mechanism
DCCAE	Department of Communications, Climate Action & Environment
DfE	Department for the Economy
DSU	Demand Side Unit
EC	European Commission
ECPC	Existing Capacity Price Cap
EEAG	The Environmental and Energy State Aid Guidelines
EU	European Union
GB	Great Britain
GTUoS	Generator Transmission Use of System
GUA	Generating Unit Agreement
HLD	High Level Design
I-SEM	Integrated Single Electricity Market
LoLE	Loss of Load Expectation
LOLP	Loss of Load Probability
LRMC	Long Run Marginal Cost
MW	Megawatt
MWh	Megawatt hour
NG	National Grid
NGFC	Net Going Forward Costs
OCGT	Open Cycle Gas Turbine
PQ	Price Quantity
PSO	Public Service Obligation
RO	Reliability Option
SEM	Single Electricity Market
SCR	Suppliers Contribution Rate
SP	Strike Price
SRMC	Short Run Marginal Cost
TLAF	Transmission Loss Adjustment Factor
TSC	Trading and Settlement Code
TSOs	Transmission System Operators
US	United States