



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

**Capacity Remuneration Mechanism (CRM)  
2019/20 T-1 Capacity Auction Parameters and Enduring  
De-rating Methodology**

**Decision Paper**

**SEM-18-030**

**01 June 2018**

## EXECUTIVE SUMMARY

The I-SEM CRM Detailed Design has been developed through an extensive series of consultation and decision papers. This involved substantial interaction between stakeholders, including both System Operators and Industry. Decisions made during the Detailed Design were translated into auction market rules to form the Capacity Market Code (CMC) (SEM-17-033) which was published in June 2017. The CMC sets out the arrangements whereby market participants can qualify for, and participate in, auctions for the award of capacity. The settlement arrangements for the Capacity Remuneration Mechanism (CRM) form part of the revised Trading and Settlement Code (TSC) (SEM-17-024) published in April 2017. The European Commission (EC) gave State aid approval for the CRM on 24 November 2017.

The first transitional T-1 Capacity Auction took place in December 2017 for Capacity Year (CY) 2018/19. This decision paper relates to the second transitional T-1 Capacity Auction being CY 2019/20 and is scheduled for 13 December 2018<sup>1</sup>.

The purpose of this decision paper is to:

- Set out the decision for the T-1 CY2019/20 capacity auction parameters;
- Set out the decision, applicable to future capacity auctions occurring after the T-1 CY2019/20 auction, for the enduring de-rating methodology specifically relating to storage and other capacity providers who are subject to run-hour limitations;
- Set out the decision relating to the Long-Stop Date and termination of awarded new capacity without a multi-year Reliability Option.

The decisions within this paper follow on from the associated consultation (SEM-18-009) which closed on 19 April 2018. The consultation paper also provided an update on the EC State aid decision and the current thinking regarding the timing of future auctions.

Given the level of detail and consultation the SEM Committee carried out in setting the parameters<sup>2</sup> for the first transitional capacity auction CY2018/19 and the experience of this first transitional auction the proposed approach in the consultation paper was to continue, where possible, with the same parameters for this transitional T-1 CY2019/20 capacity auction. Also contained within the consultation paper was the TSOs' proposals relating to the enduring de-rating methodology specifically for storage capacity and run-hour limited capacity. Furthermore, a proposed policy refinement was made in relation to the Long Stop Date and termination of new capacity without a multi-year Reliability Option.

Fifteen responses were received to the CRM T-1 CY 2019/20 consultation. All non-confidential responses to the consultation (SEM-18-009) have been published on the SEM Committee website.

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<sup>1</sup> CY2019/20 Capacity Auction Timetable: <http://www.sem-o.com/ISEM/General/CAT1920T-1%20-%202019%202020%20T-1%20Capacity%20Auction%20Timetable.pdf>

<sup>2</sup> CRM Decision 1 (SEM-15-103); CRM Decision 2 (SEM-16-022); CRM Decision 3 (SEM-16-039); CRM Locational Issues Decision (SEM-16-081); Capacity Requirement and De-Rating Methodology Decision (SEM-16-082); CRM Parameters Decision (SEM-17-022)

Most respondents supported the proposal to keep the majority of parameters for this auction unchanged from those applied to T-1 CY 2018/19.

Most respondents supported the TSOs' proposed enduring storage methodology at a high level, however there were concerns with the use of system-wide average outage statistics for other storage, in the absence of significant historical data.

Most respondents supported the TSOs' proposal to reflect a unit's run-hour limitation in the Capacity Market. This applies to capacity providers with e.g. emission limitation and Demand Side Units (DSUs) with a maximum duration for their demand reduction.

All respondents who commented on the refinement to the policy decision for the Long Stop Date and Substantial Financial Completion, agreed that changes were necessary to avoid future unintended consequences.

At the time of the consultation, the intention was that all decisions within this paper would, where possible, apply to the T-1 CY 2019/20 capacity auction. However due to delays in the publication of a revised Generation Capacity Statement and a revised Ten Year Transmission Forecast Statement, which are source documents used within the CRM Capacity Requirement and De-Rating Methodology and the Locational Capacity Constraints Methodology, the SEM Committee has taken the approach that some decisions will apply to the T-1 CY2019/20 capacity auction (Chapters 2 and 4) and other decisions will be implemented to future auctions occurring after the T-1 CY2019/20 capacity auction (Chapter 3).

## **Summary of Key Decisions**

### **For the forthcoming T-1 CY2019/20 capacity auction the SEM Committee has decided:**

- T-1 CY2019/20 parameters, for the purposes of the Initial Auction Information Pack, are to remain consistent with those that applied to the CY 2018/19 auction. Exceptions are the exchange rate and thereby corresponding Sterling parameters and also DSU de-rating curves.
- Demand Side Units (DSUs) with a limited duration for their demand reduction of less than or equal to 6 hours (based on their Maximum Down Time) will use the Other Storage De-rating curve when determining their de-rating factors to apply to the capacity market.
- Chapter 2 provides a table detailing the parameters that will apply, which will be incorporated into the Initial Auction Information Pack due to be published 1 June 2018; and
- For one-year Reliability Options, the Long Stop Date should be one-month after the start of the Capacity Year; and for multi-year Reliability Options, the Long Stop Date would remain unchanged at 18 months. The Substantial Financial Completion date will flex with each capacity auction and will be set separately for each auction. This policy decision requires modifications to the Capacity Market Code to bring the decision into effect. This will be progressed as soon as possible through the modification process and is expected to apply to Capacity Year 2019/20 onwards. Further detail is provided in Chapter 4.

**For future capacity auctions occurring after the T-1 CY2019/20 auction, the SEM Committee has decided:**

- Interconnector de-rating methodology will be refined to better account for GB assumptions with the External Market De-Rating Factor being selected using a least worst regrets analysis.
- The enduring storage methodology will reflect both the generation size and storage duration with the detailed methodology outlined in the TSOs methodology paper in Appendix A.
- A new Technology Class is to be formalised for “Other Storage” and will apply the system wide outage statistics until there is sufficient SEM historical data.
- De-rating factors, associated with both “Pumped Storage” and “Other Storage” technology classes will be specified in 30 minute intervals up to a storage duration of 6.5 hours and kept under periodic review. Linear interpolation will apply for those units with a storage duration which is not a multiple of 30 minutes. All storage units can avail of a decreasing tolerance (DECTOL) of up to 100% on a voluntary basis.
- A policy decision has been made to allow a voluntary decreasing tolerance (DECTOL) to apply to generation with emission limitations or run-hour limitations (other than DSUs and Storage technology classes which have separate arrangements). This requires a Capacity Market Code modification before it can become effective. Due to time constraints, this particular policy decision will not apply to the T-1 CY 2019/20 capacity auction but will be progressed as soon as possible through the modification process with an expectation of being effective for the T-4 CY 2022/23 capacity auction process.

In summary, the parameters, as set out in Chapter 2, will apply to the transitional T-1 Capacity Auction for CY2019/20 and will be incorporated into the corresponding Initial Auction Information Pack (IAIP).

The policy decisions relating to the DECTOL for run-hour limited generation (except DSUs and Storage which have/will have separate arrangements) and the Long-Stop Date and termination of new capacity decision for awarded new capacity without a multi-year Reliability Option will both be progressed through the Capacity Market Code modification process.

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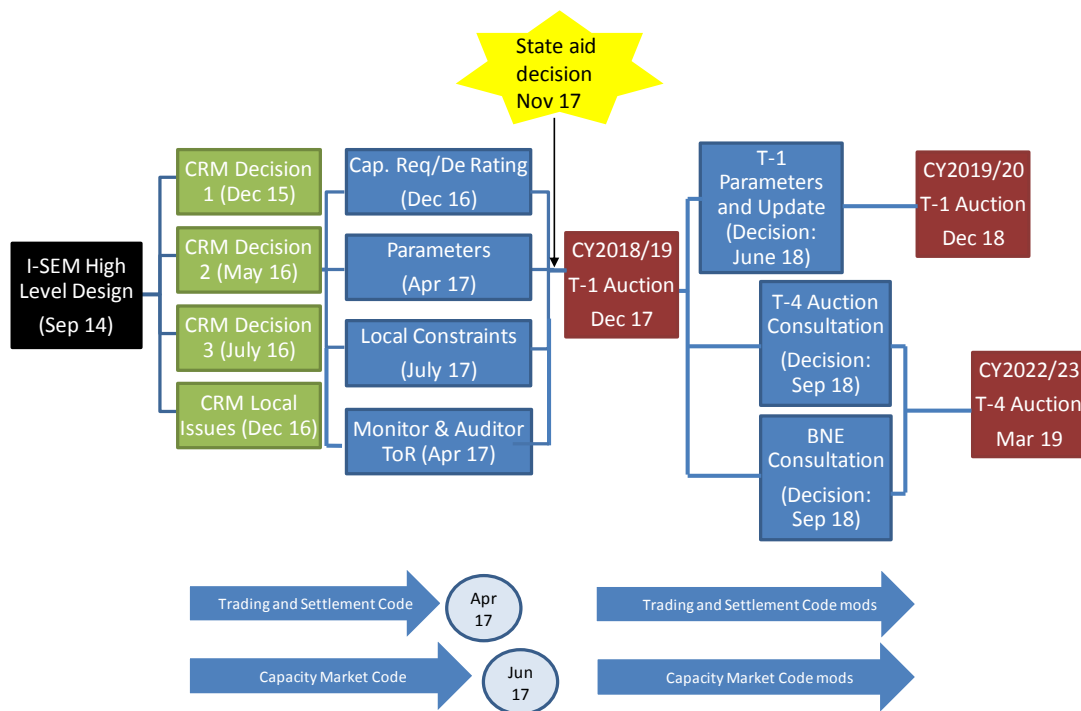
# 1. OVERVIEW

## 1.1 BACKGROUND

- 1.1.1 The I-SEM CRM Detailed Design has been developed through an extensive series of consultation and decision papers. This involved substantial interaction between stakeholders, including both System Operators and Industry. This interaction took the form of numerous workshops and meetings in addition to the feedback from the consultations.
- 1.1.2 Decisions made during the aforementioned consultations were translated into auction market rules to form the Capacity Market Code (CMC) (SEM-17-033) published in June 2017. The CMC sets out the arrangements whereby market participants can qualify for and participate in auctions for the award of capacity. The settlement arrangements for the Capacity Remuneration Mechanism (CRM) form part of the revised Trading and Settlement Code (TSC) (SEM-17-024) published in April 2017. A summary of this process is shown in Figure 1 below, along with key CRM development milestones over the next 12 months.

Figure 1: Key CRM milestones

### Summary of CRM Process



- 1.1.3 The introduction of the CRM involved formal notification to the European Commission (EC) of the proposed mechanism for purposes of State aid. This process was led by Department of Communications, Climate Action & Environment (DCCA) and Department for the Economy (DfE) who together with the Regulatory Authorities (CRU and UR) engaged with the EC in advance of the notification and during the notification process.

- 1.1.4 The EC approved the CRM on 24 November 2017. The first Capacity Auction took place in December 2017 to cover the period from I-SEM go-live to 30 September 2019, i.e. CY 2018/19. Following the completion of the CY2018/19 transitional auction, the SEM Committee is now planning for the next auctions.
- 1.1.5 This decision paper relates to the second transitional T-1 Capacity Auction being CY 2019/20 scheduled for 13 December 2018<sup>3</sup> and makes decisions on the enduring de-rating methodology applicable to future capacity auctions occurring after the T-1 CY2019/20. The first T-4 auction for CY2022/23 is planned for March 2019.
- 1.1.6 The purpose of this decision paper is to:
- Set out the decision for the T-1 CY2019/20 capacity auction parameters;
  - Set out the decision, applicable to future capacity auctions occurring after T-1 CY2019/20 auction, for the enduring de-rating methodology specifically relating to storage and other capacity providers who are subject to run-hour limitations;
  - Set out the decision relating to the Long-Stop Date and termination of awarded new capacity without a multi-year Reliability Option.
- 1.1.7 Each chapter of this decision paper sets out a summary of the consultation proposal, provides a summary of responses, and sets out the SEM Committee’s decision.

## 1.2 RESPONSES TO CONSULTATION

- 1.2.1 This paper includes a summary of the responses made to the CRM T-1 2019/20 Capacity Auction Parameters and Enduring Storage De-rating Methodology consultation paper (SEM-18-009) which was published on 13 March 2018. Within some responses, broader issues were raised which did not specifically relate to this consultation paper and therefore have not been specifically addressed in this decision paper.
- 1.2.2 A total of 15 responses to the consultation were received. Of the 15 responses, one was marked confidential. We note that most of the arguments raised in the confidential response was 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 response which is not available to all stakeholders. The remaining 14 are outlined below and copies can be obtained from the SEM Committee website.
- AES
  - BGE
  - Bord na Mona
  - Eirgrid/SONI
  - Electric Ireland
  - ESB
  - Innogy Renewables
  - IWEA
  - Moyle Interconnector
  - Power NI PPB

<sup>3</sup> CY2019/20 Capacity Auction Timetable: <http://www.sem-o.com/ISEM/General/CAT1920T-1%20-%202019%202020%20T-1%20Capacity%20Auction%20Timetable.pdf>

- Endeco/Grid Beyond
- Energia
- RES
- Tynagh

## 1.3 ASSESSMENT CRITERIA

1.3.1 Assessment criteria for the detailed design of the CRM 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 March 2013.

1.3.2 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.

1.3.3 All elements of the design and parameters should be consistent with any undertaking given to the European Commission as part of the State aid approval, and any other EU regulations- all of which are consistent with meeting the EU Internal Market criteria.



## 2. CAPACITY YEAR 2019/20 T-1 PARAMETERS

### 2.1 INTRODUCTION

- 2.1.1 The decisions made in this Chapter 2 will apply to T-1 CY 2019/20 capacity auction.
- 2.1.2 At the time of the consultation, the intention was to update only those parameters deemed necessary to be updated for the T-1 CY2019/20 capacity auction, most notable being the capacity requirement, de-rating curves and locational capacity constraint parameters.
- 2.1.3 The Generation Capacity Statement (GCS) and the Ten Year Transmission Forecast Statement (TYTFS) are source documents applied to the approved Capacity Requirement and De-Rating Methodology<sup>4</sup> and the approved Locational Capacity Constraints Methodology<sup>5</sup> which inform some of the parameters for the capacity auctions. Currently the latest approved and published Generation Capacity Statement is GCS 2017-2026 and the latest approved and published All-island Ten Year Transmission Forecast Statement is TYTFS 2016-2025 both of which were in place for the T-1 CY2018/19 capacity auction.
- 2.1.4 However, due to the delay in the publication of the latest Generation Capacity Statement (GCS 2018) and the Ten Year Transmission Forecast Statement (TYTFS 2017), the SEM Committee has taken the decision, for the purposes of the Initial Auction Information Pack, to keep the T-1 CY2019/20 parameters consistent with those which applied for the T-1 CY2018/19 capacity auction (with the exception of the exchange rate and thereby corresponding Sterling parameters and also the DSU de-rating curves).
- 2.1.5 With respect to DSUs with limited demand reduction duration capability a proposal was made in the consultation for such units to have this limitation reflected in their de-rating values. The SEM Committee have decided to implement separate arrangements for such DSUs with a Maximum Down Time of less than or equal to 6 hours with effect from the T-1 CY2019/20 capacity year. This chapter outlines the consultation summary, consultation responses, SEM Committee response and SEM Committee decision in respect to de-rating DSU.
- 2.1.6 It is important to note that a Final Auction Information Pack will be published for the T-1 CY2019/20 auction in November 2018 following SEM Committee's separate approval of updated parameters (demand curve, locational capacity constraint minimum requirement and the exchange rate). Further detail is provided below.

### 2.2 CONSULTATION SUMMARY

- 2.2.1 Given the level of detail and consultation the SEM Committee carried out in setting the parameters<sup>6</sup> for the first transitional T-1 capacity auction being CY2018/19 and the experience of the first transitional auction, the SEM Committee was minded to continue with the same

<sup>4</sup> SEM-16-082

<sup>5</sup> SEM-17-040

<sup>6</sup> CRM Decision 1 (SEM-15-103); CRM Decision 2 (SEM-16-022); CRM Decision 3 (SEM-16-039); CRM Locational Issues Decision (SEM-16-081); Capacity Requirement and De-Rating Methodology Decision (SEM-16-082); CRM Parameters Decision (SEM-17-022)

parameters for this transitional T-1 CY2019/20 capacity auction, where possible. The SEM Committee did not see reason to change the parameters in the short term but intended having a full review of the parameters in advance of the first T-4 capacity auction.

- 2.2.2 For ease of reference a table was provided which listed the parameters to be contained within the CY 2019/20 Initial Auction Information Pack together with the proposed CY 2019/20 parameters and a comparison with those final parameters which were in place for the first transitional auction i.e. Capacity Year 2018/19<sup>7</sup>.
- 2.2.3 At the time of the consultation it was envisaged that the majority of parameters proposed would remain unchanged, however the expectation was that the capacity requirement and de-rating curves would be updated in line with the approved methodology<sup>8</sup> and, where appropriate, decisions made in this decision paper. The Annual Capacity Payments Exchange Rate was expected to be updated for the Initial Auction Information Pack. This chapter goes on to explain the SEM Committee's decision.
- 2.2.4 In the context of this second transitional capacity auction the SEM Committee was minded to keep the same auction format as the first transitional auction, and the consultation paper provided further detail on the following parameters for which the parameter (or methodology) was proposed to remain unchanged: Auction Price Cap, Existing Capacity Price Cap, Unit Specific Price Cap, Demand Curve, Locational Capacity Constraints and Administered Scarcity Pricing.

### ***Demand Side Units - Maximum Down Time***

- 2.2.5 For Demand Side Units which have significant limitations for their operation, such as setting a maximum duration (or Maximum Down Time) for their demand reduction a proposal was made to treat such units in a manner consistent with storage units. For example, a DSUs Maximum Down Time would be considered equivalent to a storage unit's hours of storage using the de-rating factors from the Other Storage de-rating curves.

## **2.3 SUMMARY OF RESPONSES**

- 2.3.1 Most respondents who commented were in general agreement with keeping the parameters consistent as much as possible with those of the first CY 2018/19 capacity auction. Although some provided comments on specific parameters as follows:
- New Capacity Investment Rate Threshold should be reset as the threshold is too high and creates a barrier to entry for battery storage and other technologies to obtain a multi-year Reliability Option;

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<sup>7</sup> <http://www.sem-o.com/ISEM/General/Final%20Auction%20Information%20Pack%20v1.0.pdf> based upon decisions within CRM Parameters Decision paper <https://www.semcommittee.com/publication/publication-crm-parameters-decision>

<sup>8</sup> Capacity Requirement and De-Rating Factor Methodology decision papers are SEM-16-082 and SEM-17-040b available on the SEM Committee website

- The capacity requirement should reflect increased demand e.g. data centres, e-cars and electrification of heat. Another respondent commented on the demand growth specifically in Dublin and the need for this to be captured in the capacity requirement.
- One respondent requested the price caps be reviewed with Net CONE indexed and thereby the Auction Price Cap and Existing Capacity Price Cap should be inflated. Another respondent requested if the price caps are to remain unchanged the price caps should retain their 2018/19 Sterling value and the Euro price be determined from it.
- Tolerance bands need to be reviewed for meaningful positive tolerance bands.
- Ambiguity of technology class for CCGT which has both a gas turbine and steam turbine creating a risk of different classifications with differing de-rating factors.

2.3.2 A few respondents did not support the 'minded to' approach and the reasons cited included one respondent considered that there was too much uncertainty regarding potential plant exit to respond.

#### *Demand Side Units - Maximum Down Time*

2.3.3 The majority of respondents who commented, agreed with the proposal to de-rate DSUs with limited Maximum Down Time in a manner consistent with storage units as a means of reflecting the impact of Maximum Down Time on the contribution to security of supply.

2.3.4 The reasons given by those few respondents who did not support the proposal were:

- Material concerns with the use of other storage de-rating factors being applied to DSUs given they are totally different technologies;
- Discourages demand side response participation with I-SEM and the capacity market by reducing the revenues which encourage businesses to contribute their capability to the stability of the system.

## 2.4 SEM COMMITTEE RESPONSE

2.4.1 The SEM Committee is keen to keep the parameters as consistent as possible with the first CY2018/19 capacity auction with variations only to those parameters for which it is deemed appropriate.

2.4.2 The New Capacity Investment Rate Threshold (NCIRT) was set in light of experience in other markets together with international benchmarking as set out in the first CRM Parameters decision (SEM-17-022). The SEM Committee has decided to keep the NCIRT at €300,000 per MW. New capacity which does not meet this threshold can participate in the capacity auctions for single-year Reliability Options.

2.4.3 The capacity requirement will reflect the approved methodology (SEM-16-082). It is important to note that the demand forecast for capacity year 2021/22 will be applied to each of the four transitional capacity auctions as a means to managing the change from the Capacity Payments Mechanism to this Capacity Remuneration Mechanism. As per the Capacity Market Code

(section F.3.1.4), the Regulatory Authorities may adjust the Demand Curve within the Final Auction Information Pack (FAIP) (which is due to be published in November 2018). Following finalisation of the GCS 2018, the SEM Committee may need to make adjustments where necessary to the Demand Curve in the FAIP.

- 2.4.4 Based upon the experience of the first T-1 capacity auction (CY 2018/19) the SEM Committee considers the setting of the price caps remains appropriate and no change will be made to the Euro level, but recognise the Sterling equivalent will be updated using the latest Annual Capacity Payment Exchange Rate which will be provided in the Initial Auction Information Pack.
- 2.4.5 The SEM Committee consider the application of a decreasing tolerance band (DECTOL) of 100% for DSUs to continue to be appropriate for this CY 2019/20 T-1 capacity auction. Tolerance bands have been considered further for storage and emissions limited or run-hour limited generation and the decisions made in Chapter 3 of this decision paper will apply to future capacity auctions occurring after the T-1 CY2019/20 auction.

The SEM Committee note the TSOs responsibility as part of the capacity auction qualification process to verify that the correct technology class and de-rating factors are applied to the capacity auction and therefore any ambiguity regarding CCGTs will be identified and a consistent approach applied.

### ***Demand Side Units - Maximum Down Time***

- 2.4.6 It is not uncommon for Demand Side Units to set significant limitations for their operations, such as setting a maximum duration (or Maximum Down Time) for their demand reduction. Under Grid Code rules this can be as low as two hours. As with storage units, a unit with these characteristics does not deliver the same benefit to adequacy as a unit that does not limit its dispatch.
- 2.4.7 As a result the SEM Committee considers it appropriate to treat such Demand Side Units in a manner consistent with storage units and therefore a DSU's Maximum Down Time would be considered equivalent to a storage unit's Hours of Storage. For De-rating Factor calculation purposes, DSUs are currently treated as a new technology and are given the System Wide outage characteristics. However, DSUs with a Maximum Down Time of less than or equal to 6 hours should take their De-rating Factors from the Other Storage de-rating curves set out in the appropriate Initial Auction Information Pack. The introduction of de-rating factors for DSUs with limited duration can and should be implemented for the T-1 CY2019/20 capacity auction.

## **2.5 SEM COMMITTEE DECISIONS**

- 2.5.1 The SEM Committee is keen to keep the parameters as consistent as possible given the level of detail and consultation that has been carried out in relation to developing and implementing the CRM.
- 2.5.2 The SEM Committee has made a determination in respect of the capacity requirement and de-rating factors applicable to the CY2019/20 capacity auction. Currently the latest approved and

published Generation Capacity Statement is GCS 2017-2026 and the latest approved and published All-island Ten Year Transmission Forecast Statement is TYTFS 2016-2025 both of which were in place for the first T-1 capacity auction i.e. CY2018/19. These source documents are used as inputs to the CRM capacity requirement and de-rating methodology and the locational capacity constraints methodology. Given there is no change in the source documentation published and the capacity requirement is based on the demand forecast for year 2021/22<sup>9</sup> the SEM Committee has decided that in the absence of finalised source documents, for the purpose of the Initial Auction Information Pack, the capacity requirement, de-rating curves and locational capacity constraint parameters will be those which were in place for the T-1 CY2018/19 capacity auction.

- 2.5.3 Given the above, the SEM Committee has taken the decision, for the purposes of the Initial Auction Information Pack, to keep the T-1 CY2019/20 parameters consistent with those which applied for the T-1 CY2018/19 capacity auction (with the exception of the exchange rate and thereby corresponding Sterling parameters and also the DSU de-rating curves).

#### ***Demand Side Units-Maximum Down Time***

- 2.5.4 Demand Side Units (DSUs) with a limited duration of less than or equal to 6 hours for their demand reduction i.e. Maximum Down Time will use the Other Storage De-rating curve when determining their de-rating factors to apply to the capacity market. For clarity, those DSUs with a Maximum Down Time greater than 6 hours will continue to base their de-rating on the general DSU technology class de-rating curves provided in the Initial Auction Information Pack.

#### ***In Summary***

- 2.5.5 As per the Capacity Market Code (section F.3.1.4), the Regulatory Authorities may adjust the Demand Curve within the Final Auction Information Pack (FAIP) (which is due to be published in November 2018). Following finalisation of the GCS 2018, the SEM Committee may need to make adjustments where necessary to the Demand Curve in the FAIP.
- 2.5.6 Table 1 below detailed the parameters to apply to this transitional T-1 capacity auction for CY2019/20 and indicates those which are indicative and those which are final. A comparison with the final T-1 CY 2018/19 parameters is also provided. The CY 2019/20 Initial Auction Information Pack will reflect the decisions within this chapter. A Final Auction Information Pack will be published in November 2018 and will finalise those parameters below which are shown as indicative for the purposes of the Initial Auction Information Pack.

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<sup>9</sup> Applicable for the four transitional auctions.

Table 1: Summary of CY2019/20 Parameters compared with the CY2018/19 Final Auction Information Pack (FAIP) Parameters. Also shows, in accordance with section D.3.1.3 of CMC, which parameters are final and those which are indicative or anticipated for the purposes of the Initial Auction Information Pack (IAIP) and will be finalised for the CY2019/20 Final Auction Information Pack (FAIP)

Parameter	Decision T-1 2019/20	Actual T-1 2018/19	IAIP	FAIP
<b>Auction Price Cap</b>	€123,190/MW per year	€123,190/MW per year	Final	
<b>Existing Capacity Price Cap</b>	€41,060/MW per year	€41,060/MW per year	Final	
<b>Capacity Requirement</b>	7030 MW based on demand forecast for CY2021/22 (As per CY2018/19 FAIP)	7030 MW based on demand forecast for CY2021/22	Final	
<b>Indicative Demand Curve Shape</b>	Same shape	As per FAIP	Indicative	Final
<b>Locational Capacity Constraint Areas (including nodes)*</b>	As per CY2018/19 FAIP	Dublin & NI	Final	
<b>De-rating Curves Storage Capacity</b>	As per CY2018/19 FAIP	Interim arrangement	Final	
<b>De-rating Curves for DSUs (with Maximum Down Time &gt;6 hrs)</b>	As per CY2018/19 FAIP	System wide de-rating used	Final	
<b>De-rating Curves for DSUs (with Maximum Down Time ≤ 6 hrs)</b>	Apply De-Rating Curves for "Other Storage"	N/A	Final	
<b>De-rating Curves for Interconnectors</b>	As per CY2018/19 FAIP	As per IAIP/FAIP	Final	
<b>De-rating Curves by Tech Class (excluding Interconnectors)</b>	As per CY2018/19 FAIP	As per IAIP/FAIP	Final	
<b>Tolerance Bands</b>	All 0% except DSU 100% DECTOL	All 0% except DSU 100% DECTOL	Final	
<b>New Capacity Investment Rate Threshold</b>	€300,000 MW	€300,000 MW; 40% BNE Invt Cost	Final	
<b>Performance Securities</b>	As per CY2018/19 FAIP	As per FAIP - staggered rates	Final	
<b>Termination Charges</b>	As per CY2018/19 FAIP	As per FAIP - staggered rates aligned with performance securities	Final	
<b>Administered Scarcity Price</b>	Reserve 500MW; ASP €500 - €3000/MWh	Reserve 500MW; ASP €500 - €3000/MWh	Anticipated	
<b>Strike Price parameter: DSU Floor Price</b>	€500 MW	€500 MW	Final	
<b>Strike Price parameters: Others</b>	As per CY2018/19 FAIP	As per FAIP	Anticipated	
<b>Annual Capacity Payment Exchange Rate</b>	Updated exchange rate	As per FAIP	Indicative	Final
<b>Awarded Capacity</b>	Zero	Zero	Final	
<b>Annual Stop-Loss Limit Factor</b>	1.5	1.5	Final	
<b>Billing Period Stop-Loss Limit Factor</b>	0.5	0.5	Final	

\*Locational Capacity Constraint Minimum Requirement is provided in FAIP only.

## 3. DE-RATING FACTORS

### 3.1 INTRODUCTION

- 3.1.1 The decisions made in this Section 3 and represented in Appendix A, associated with the enduring de-rating methodology will apply to future capacity auctions occurring after the T-1 CY 2019/20 capacity auction.
- 3.1.2 At the time of the consultation it was envisaged the decisions within this section would, where possible, be applicable to the CY 2019/20. However, due to the delay in publication of the Generation Capacity Statement 2018 by the TSOs, which is a source document for the de-rating methodology, and the need for consistency in underlying assumptions the SEM Committee has decided to delay the implementation of the decisions within this Chapter which will now apply to future capacity auctions occurring after the T-1 CY2019/20 capacity auction. Therefore the SEM Committee have decided that the de-rating curves which applied to all technology classes for the T-1 CY2018/19 capacity auction will also apply to this second transitional T-1 capacity auction being CY2019/20. The exception to this relates to the introduction of specific arrangements for de-rating DSUs which limit their duration for demand reduction and this is detailed further in Chapter 2 of this decision paper as it will be effective for the T-1 CY2019/20 capacity auction.

### 3.2 CONSULTATION SUMMARY

- 3.2.1 The RAs are responsible for calculating the interconnector de-rating factors, according to the methodology determined by the SEM Committee. Within this consultation paper some refinements to the inputs and the methodology were set out together with indicative results.
- 3.2.2 As part of the Capacity Requirement and De-Rating Factor Methodology Decision (SEM-16-082), the RAs committed to consulting on the methodology used to determine De-Rating Factors (DRFs) for storage units prior to the first auction following the first transitional T-1 auction (CY2018/19), which will be the transitional T-1 auction for Capacity Year 2019/20.
- 3.2.3 Therefore the consultation paper included an Appendix which contained the TSOs proposals for the following:
- Enduring methodology for storage technologies with de-rating factors given as a function of both generation sizes (measured in MW) and storage durations (measured in hours); and
  - Treatment of capacity providers (other than storage) who are subject to run-hour limitations such as hydro units and emission limited generators.

#### *Interconnector De-Rating Factor Methodology*

- 3.2.4 The methodology for determining the de-rating factors for the interconnectors was set out in the Capacity Requirement and De-Rating Methodology Decision (SEM-16-082).

- 3.2.5 The values of External Market De-rating Factor (EMDF) and interconnector outage rates for the first T-1 Capacity Auction (CY2018/19) were set out in the CRM Parameters Decision (SEM-17-022).
- 3.2.6 The Consultation Paper (SEM-18-009) reflected broadly the methodology used for CY2018/19. However, it did identify three areas of possible change.

***Treatment of outages for small and embedded generation in GB***

- 3.2.7 The latest Future Energy Scenarios (FES 2017) projections for GB, produced by National Grid, show clearly that the GB plant mix is undergoing a significant shift from large to smaller scale capacity. In particular, for all scenarios, there was a shift from large coal, gas and nuclear sets towards much smaller scale generation, e.g. batteries and gas engines. This change suggested a need to modify the methodology used to determine the probability of scarcity occurring in GB.
- 3.2.8 The FES 2017 does not provide a detailed breakdown of the distributed and sub-1MW generation being forecast, but analysis of the available data suggested a typical unit size of significantly less than 20MW. At this scale, the variation in coincident outages between different half-hours is low and so it was proposed to apply an averaged outage rate to this small and embedded capacity when considering its contribution to meeting demand in GB. A forced outage rate of 7% was proposed as a likely conservative assumption.
- 3.2.9 For the proposed new methodology, an estimate of total GB demand for each half-hour is adjusted upwards for the need to hold reserve and downwards to account for the demand met by the estimated generation from wind, solar and distributed and sub-1MW generation. The modelling then determines the probability that coincident outages of large scale capacity, for the relevant FES scenario, is unable to meet this “residual” demand. Otherwise, the methodology was as set out in SEM-16-082b.

***Selecting between the FES scenarios***

- 3.2.10 The GB FES 2017 has four different demand scenarios. In developing the EMDF for CY2018/19, the RAs used the No Progression scenario, which was judged to be the most likely outcome for that period. On that occasion, there was not much difference in GB demand in the different scenarios and they did not deliver materially different estimates of the EMDF.
- 3.2.11 This would not be true for a T-4 auction where the four different FES scenarios for the GB generation mix are likely to produce markedly different values for the deliverability of GB capacity to the I-SEM at times of scarcity. There is a considerable spread in the GB generation mix assumed in the four FES scenarios and this has a significant impact on the determination of EMDF.
- 3.2.12 Rather than trying to pick a “winner” from the four scenarios, the RAs proposed using a least-worst regrets analysis approach to selecting the scenario to be used to determine the EMDF for GB.



3.2.13 Additionally, the value of EMDF was evaluated with two different assumptions for the outage rate of large scale GB capacity: 7% as used for CY2018/19 and 10% which is more consistent with the current de-rating factors being used in GB.

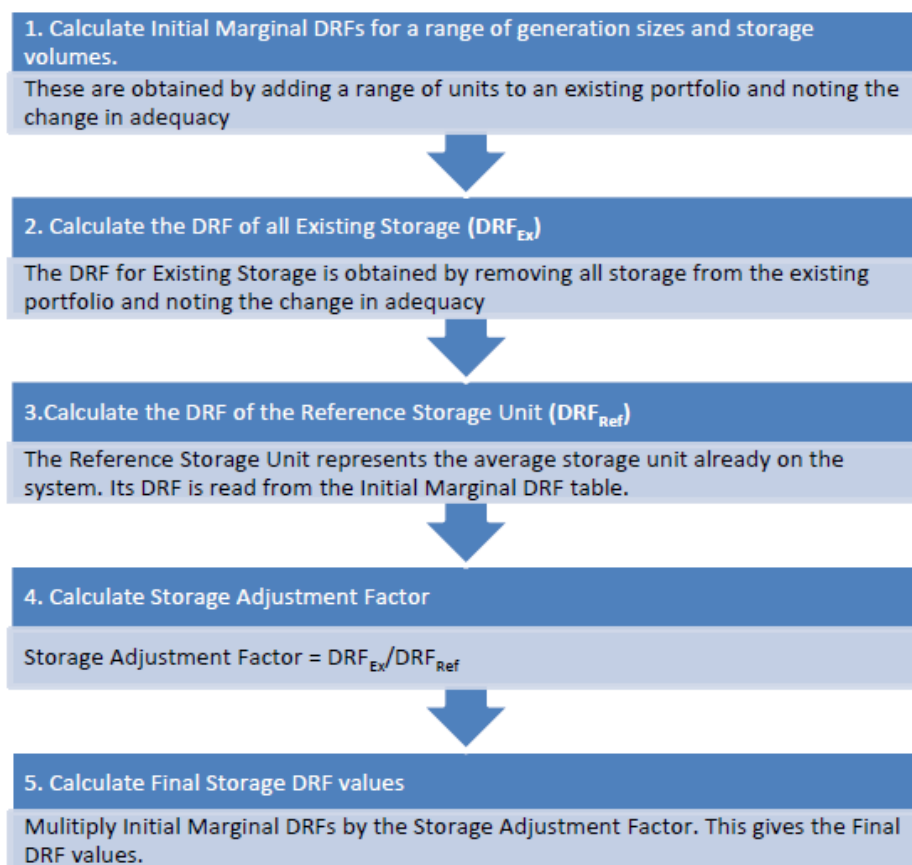
**Determining EMDF for markets other than GB**

3.2.14 The RAs proposed to determine a value of EMDF for the GB market alone, unless respondents raised a requirement to model any additional market(s) as a result of new planned interconnection.

**Enduring Storage De-Rating Methodology**

3.2.15 The enduring storage de-rating methodology proposed by the TSOs in Appendix A of the consultation paper (SEM-18-009) proposed to calculate de-rating factors for storage units as a function of both generation sizes and storage volumes. The generation sizes are given as the typical maximum output of a unit in MW, and are equivalent to Initial Capacity as described in the Capacity Market Code. The storage durations are given as the maximum number of hours which all units sharing the energy storage (e.g. reservoir) can run simultaneously at their generation size, before the energy storage needs to be replenished. The methodology is split into 5 steps. These are summarised in the flow chart in Figure 2 below, and were described further within the consultation paper.

Figure 2: Five steps followed in order to calculate the Final De-Rating Factors for storage units



- 3.2.16 In the absence of significant historical data, the TSOs proposed that new storage capacity (other than pumped storage) assumes the average system wide outage statistics and their de-rating factors would be taken from the Other Storage table published in the Initial Auction Information Pack.
- 3.2.17 The TSOs proposed to allow storage units to apply a decreasing tolerance (DECTOL) to their de-rated capacity to allow such units to respond to delivering system services to meet a system security need and therefore avoid the potential exposure to Capacity Market penalties. In other words, such units can apply a downward adjustment (DECTOL) to the capacity they submit into the Capacity Market auction and thereby reduce their exposure to difference payments in order to reflect their commitments to system services provisions.
- 3.2.18 The TSOs proposed to continue providing values for storage durations within 30 minute intervals within a range of 30 minutes to 6 Hours of Storage. The TSOs proposed that the largest energy storage duration for which de-rating factors are published to be 6 hours or more as it is not anticipated that units with energy storage duration of 6.5 hours or greater will enter the Capacity Market auction in the near future. For those storage units which do not have a capacity of an exact multiple of 30 minutes the TSOs preferred approach was for the use of linear interpolation between the nearest half-hour storage durations above and below the unit's storage size. Other alternative approaches were also included in the consultation paper, such as a simple rounding approach or rounding down approach.

#### ***Run-Hour Limited Capacity***

- 3.2.19 The TSOs proposed changes to the methodology for determining the de-rating factors for units (other than storage) with running constrained by emission limitations analogous to having a limited storage duration. Given the potential cumulative impact of these limitations on system adequacy it was considered appropriate to propose an adjustment to the De-rating Factors for units affected by such limitations.
- 3.2.20 A downward adjustment (either mandatory or voluntary) to the de-rating factors was therefore proposed. This downward adjustment would reflect an estimation of how emissions limits could reduce the unit's contribution to security of supply. The voluntary downward adjustment was proposed as a DECTOL (decreasing tolerance) which would allow a unit to make an estimate of its expected run-hours in a particular year, accounting for any emissions restrictions, and adjust their exposure in the capacity market accordingly. An alternative mandatory adjustment was suggested which would involve the RAs setting a threshold upon which the TSOs would estimate a scaling factor to apply to the unit's de-rating factors.

## 3.3 SUMMARY OF RESPONSES

### *Interconnector De-Rating Factor Methodology*

#### ***Treatment of outages for small and embedded generation in GB***

- 3.3.1 A significant majority of respondents, who expressed a view, supported the approach set out in the consultation paper.
- 3.3.2 A few respondents questioned the choice of forced outage rate used for small and embedded generation: suggesting it was either too low or too high. A couple of respondents sought more information on the choice of level and the impact of choosing different values.
- 3.3.3 One respondent specifically supported the use of two different outage scenarios.
- 3.3.4 One respondent requested confirmation that the volume of distributed and <1MW capacity in GB would be derived from the FES.
- 3.3.5 One respondent felt that the interconnectors should not be permitted to participate in the I-SEM CRM given that they were also participants in the GB capacity market.

#### ***Selecting between the FES scenarios***

- 3.3.6 The majority of respondents, who expressed a view, supported use of a least-worst regrets analysis to select between FES scenarios.
- 3.3.7 One respondent was concerned that use of least-worst regrets analysis would over-estimate the contribution from GB capacity to the I-SEM and raised the issue of potential negative social welfare effects of failure to deliver from an external system.
- 3.3.8 One respondent requested more detail on the results of the different scenarios used. Another respondent asked for more background on the choice of EMDF given the potential range of values shown.

#### ***Determining EMDF for markets other than GB***

- 3.3.9 The majority of respondents, who expressed a view, supported the decision to determine an EMDF only for GB.
- 3.3.10 Two respondents asked about the treatment of other European markets in the modelling of GB.

### *Enduring Storage De-Rating Methodology*

- 3.3.11 A mixed response was received which is evident by one third agreeing with the proposals, one third consider further amendments are required or that the methodology is inappropriate and the remaining third gave no view.
- 3.3.12 The key themes of those respondents who considered further modifications are required include:

- The proposals are overly complicated and a more simplified approach should be taken such as the de-rating factor remaining constant as unit size increases or alternatively the MW size should be removed and the choice of outage factor simplified;
- Questioned the need to have significantly lower de-rating factors against the equivalent GB de-rating factors which will likely result in the underestimation of the value offered by other storage (particularly battery storage) in the I-SEM CRM;
- A disadvantage is the de-rating factor would be fixed for multi-year contracts. A recommendation was made to allow the de-rating for multi-year contracts to be updated annual so as system augmentation of degradation (particularly of battery storage) could be reflected;
- One respondent considered the proposed approach to be flawed and inefficient thereby distorting investment decisions and giving erroneous market signals as the diminishing value of additional storage must be recognised in the methodology.
- Need for consistency with DS3.

3.3.13 Of those who commented on the proposal to apply system-wide outage statistics to new storage technologies in the absence of significant historical data, there was limited support for this proposal and therefore most respondents disagreeing with this approach. The arguments given included:

- Battery storage availability is much higher than the system wide average and such new build assets should not be given the same outage statistics as aging fleet;
- International historical data should be applied or alternatively us manufacturer's data or use existing data for battery storage in the SEM;
- De-rating factors for battery storage should reward investment in designs which reduce the single point of failure and therefore have high levels of availability;
- Equal principles should apply to all storage with the use of one outage statistic applied to the storage class as a whole as is the GB approach. The system wide factor should only apply for technology for which there is no current technology class and noted that this is not the case for storage.

3.3.14 Of those who commented, strong support was provided for the TSOs proposal to use linear interpolation for storage units with storage durations which are not a multiple of 30 minutes. A couple of respondents considered a refinement is required from a pure linear approach to a curved approach given the relationship between storage levels and the de-rating factors being non-linear. Some noted that storage technologies suffers degradation and this needs to be reflected both in de-rating factors and allow yearly review of storage de-rating factors associated with multi-year contracts. A couple of respondents questioned the acceptability of the rounding solution with one respondent considering it too blunt and not worth pursuing.

- 3.3.15 There was very strong support, from those who commented, to allow storage units to apply a decreasing tolerance (DECTOL) to their de-rating capacity on a voluntary basis. One respondent considered DECTOL should be available to all units and should not be technology specific. One respondent proposed being free to choose the unit size for energy storage rather than it being dictated by the connection agreement/offer Maximum Export Capacity (MEC) while another requested further information on the requirements to be provided to demonstrate the storage capability.
- 3.3.16 Of those who commented, the vast majority considered the TSOs proposal to publish specific de-rating factors for units with energy storage volumes of up to 6.5 hours as being currently appropriate and recommended this be kept under review.

### ***Run-Hour Limited Capacity***

- 3.3.17 Of those who commented, most supported the introduction of a voluntary decreasing tolerance (DECTOL) in order to recognise a unit's run-hour limitations (e.g. emission restrictions) within the capacity market.
- 3.3.18 A number of respondents who did not support this proposal for a variety of reasons including, the de-rating factors already take account of reduced or limited running time due to application of average outage levels across the generation fleet, concerns that a DECTOL for emissions limited generation would undermine exit signals for inefficient units and the proposal would not be a true reflection of the unit's technical availability.

## **3.4 SEM COMMITTEE RESPONSE**

### ***Interconnector De-Rating Factor Methodology***

#### ***Treatment of outages for small and embedded generation in GB***

- 3.4.1 The RAs note the support for the methodology proposed.
- 3.4.2 The RAs can confirm that the volumes of distributed and <1MW capacity in GB is taken from the FES and the assumptions as to the potential size distribution of this capacity was estimated from the results of the T-4 capacity auction(s) in GB.
- 3.4.3 The RAs recognise that reliable forced outage information for small and embedded plant is not readily available. We would note that the 7% value is a standard forced outage rate used by Eurelectric for Europe-wide analysis. The alternative 10% rate was derived from the de-rating factors used in the GB market, which are themselves derived from historic GB outage data. These rates, which are likely to be based on larger plant, may not be fully applicable to small and embedded capacity. Forced outage rates for battery storage, in particular, may prove to be lower. However, such capacity is at most around one sixth of the small and embedded capacity in GB and the RAs believe that the composite rates used remain reasonable.
- 3.4.4 A 1% change in the assumed forced outage rate changes the total available capacity in GB by roughly 160MW. The impact on EMDF varies by scenario: the impact is larger on scenarios with lower values of EMDF but is generally in the range 0.5-1%. Given the relatively modest impact,

the RAs would intend to continue with the current two forced outage rate assumptions for small and embedded capacity but will keep these choices under review as better data becomes available and/or the capacity mix changes.

- 3.4.5 The RAs wish to make clear that participation by the interconnectors, and in the longer term, direct participation by external capacity is both desirable and in line with the direction of travel of European regulation and the obligations set out in the State aid approval for the CRM.

#### ***Selecting between the FES scenarios***

- 3.4.6 The RAs note the support for the methodology proposed.
- 3.4.7 The RAs can clarify that the least-worst regrets analysis of the FES scenarios considers the impact on I-SEM consumers of assuming a scenario where GB makes a larger contribution to the I-SEM Capacity Requirement than the out-turn scenario and vice versa. This analysis will tend to select a scenario with a lower contribution from GB to the I-SEM at times of scarcity as the regret of having purchased more capacity than can be delivered (valued at Value of Lost Load (VoLL)) has a stronger effect on the choice than the risk of purchasing less capacity than can be delivered (valued at Net CONE).
- 3.4.8 The RAs note that in addition to utilising the least-worst regrets analysis to select the FES scenario to be used to derive EMDF, the value chosen also attempts to avoid making unnecessary changes to EMDF from year-to-year driven by changes in modelling assumptions or scenario choice in GB. This could create inappropriate exit (or entry) signals in the I-SEM CRM. This objective requires consideration of previous values of EMDF and the likely evolution of the values based on the FES scenarios.

#### ***Determining EMDF for markets other than GB***

- 3.4.9 Based on the absence of any response suggesting new interconnection, the RAs will continue to determine an EMDF for the GB market only.
- 3.4.10 The RAs note that the impact of continental European markets on GB is captured by applying the GB de-rating factors to the expected capacity contribution from the relevant interconnectors, as set out in the methodology paper (SEM-16-082b).

#### ***Enduring Storage De-Rating Methodology***

- 3.4.11 The SEM Committee considers the proposed approach of including both the generation size and storage durations within the storage de-rating to be reasonable and appropriate for the capacity market.
- 3.4.12 The TSOs' proposed in the consultation paper that storage, other than pumped storage, e.g. battery technology, apply the average system wide outage statistics with the de-rating factors taken from the Other Storage table in the Initial Auction Information Pack. This approach was viewed as being consistent with the approach for non-storage generation, where generators not fitting into an existing category will be assumed to have the average system wide outage

statistics, with de-rating factors calculated on this basis, until such time as sufficient historical data is acquired to gain an appropriate view on the new technology's reliability.

- 3.4.13 Some respondents suggested the application of a single defined, outage statistic until further data becomes available. The SEM Committee consider that applying system-wide outage statistics is likely to be a more accurate reflection of the unit's contribution to reliability than a single pre-defined outage statistic. Some applicants suggest equal treatment with already older and proven storage units. Many storage devices are based on completely different technologies and therefore applying a pumped storage outage statistic would not be accurate. Other applicants recommend looking in technical documentation for more appropriate ways of handling new technologies. However this would require detailed analysis by the TSOs for each unit's outage history, which may not be readily available.
- 3.4.14 The SEM Committee recognises the importance of other storage e.g. battery storage, within the I-SEM but also recognises that it is a dynamic and rapidly developing technology in recent years and therefore, when considering the capacity market, a prudent approach will be taken until sufficient SEM historical outage data is available. To that end the SEM Committee supports the use of system wide outage statistics at this stage.
- 3.4.15 Commitments to deliver system services may lead to storage units expending all of their energy in a short time-frame, leaving them exposed during other trading periods. From a system security perspective, it would be conflicting to have a unit potentially exposed to Capacity Market penalties for meeting their obligations in the provision of system services.
- 3.4.16 Given the above, the SEM Committee is introducing a decreasing tolerance (DECTOL) for storage units (applicable to both "Pumped Storage" and "Other Storage" technology classes) on a voluntary basis to help facilitate the flexibility of a storage unit to meet their obligations in the provision of system services at times of stress without being unnecessarily penalised in CRM in respect of having to pay Reliability Option difference payments.
- 3.4.17 The SEM Committee note that respondents who were concerned that the de-rating factor for storage is fixed for a multi-year Reliability Option have a range of criteria that must be met in order to qualify to bid for a multi-year Reliability Option. Alternatively, storage capacity can qualify for each capacity auction and seek to bid for a one year Reliability Option and thereby can reflect any system augmentation on an annual basis.
- 3.4.18 De-rating factors for storage, currently has the smallest energy storage duration at which de-rating factors are published given as 30 minutes, increasing in intervals of 30 minutes. For those units with a storage capacity which is not an exact multiple of 30 minutes some respondents suggested changing the proposed linear interpolation to polynomial or logarithmic methods. Such approaches would increase the complexity of the calculation. Therefore in seeking a balance between complexity and added value the SEM Committee considers the linear interpolation between the nearest half-hour storage durations above and below its storage size to be a reasonable approach to apply to the capacity market.
- 3.4.19 The SEM Committee do not anticipate the entry of units with energy storage durations of 6.5 hours or greater into the capacity market auctions for the foreseeable future. Therefore the

largest energy storage duration at which de-rating factors are published will be given as 6 hours or more. This will be reviewed periodically to ensure it remains appropriate.

### ***Run-Hour Limited Capacity***

- 3.4.20 From a capacity perspective, the SEM Committee consider it prudent to have de-rating factors which take account of the capacity contribution from capacity with run-hour limitations such as emission limitations.
- 3.4.21 Policy trends in Europe have been moving towards more strict conditions on the participation of generators with relatively high CO<sub>2</sub> emission rates in electricity markets. The SEM Committee therefore consider it pertinent to introduce a voluntary downward adjustment, through the application of a DECTOL in the I-SEM Capacity Market. This downward adjustment would reflect an estimation of how emissions limits could reduce the unit's contribution to security of supply.
- 3.4.22 A voluntary DECTOL would allow a unit to make an estimate of its expected run-hours in a particular year, accounting for any emissions restrictions, and adjust their exposure in the capacity market accordingly. Since run-hours are linked to a unit's bidding behaviour in the market, the unit owner will be best placed to estimate them.
- 3.4.23 The current outage statistics do not take into account any run-hour limitations that are due to emission restrictions or otherwise. These limitations do not bind with the existing portfolio and demand levels. However, for a system at 8 hour LOLE such limitations would be much more likely to bind. This will be kept under review and may be consulted on again for future auctions.
- 3.4.24 In respect of introducing a DECTOL for those technologies with emission limited or run-hour limited generation (other than DSU and Storage which have separate arrangements) the Capacity Market Code will require modification. The modification process will be pursued with a view to bringing this policy decision into effect as soon as possible. It is expected to be in place for future auctions commencing with the T-4 CY2022/23 capacity auction in March 2019.

## **3.5 SEM COMMITTEE DECISIONS**

- 3.5.1 All the decisions in this section will apply to future capacity auctions occurring after the T-1 CY2019/20 capacity auction, the first of which is expected to the T-4 capacity auction for capacity year 2022/23 due to take place in March 2019.

### ***Interconnector De-Rating Factor Methodology***

- 3.5.2 The SEM Committee have decided to modify the methodology to determine the External Market De-rating Factors (EMDF) to better account for embedded and sub-1MW capacity in GB as set out in the consultation paper. The methodology will be applied using both a 7% and a 10% forced outage rate.



3.5.3 The SEM Committee have decided that the GB FES scenario used as the basis for determining the EMDF value will be selected by using least-worst regrets analysis.

3.5.4 The SEM Committee have decided that an EMDF value will be determined only for GB.

### **Enduring Storage De-Rating Methodology**

3.5.5 An additional Technology Class is to be created on an enduring basis for “Other Storage” and will apply the system wide outage statistics until there is sufficient SEM historical data.

3.5.6 Both “Pumped Storage” and “Other Storage” technology classes will reflect the enduring storage de-rating methodology derived from both the generation size and storage duration with the detailed methodology outlined in the TSOs methodology paper in Appendix A.

3.5.7 Storage de-rating factors will be specified in 30 minute interval up to an energy storage duration of 6.5 hours and kept under periodic review. Linear interpolation will apply for those units with a storage duration which is not a multiple of 30 minutes and be applied between the nearest half-hour storage volumes above and below a unit’s storage size.

3.5.8 Storage units (both “Pumped Storage” and “Other Storage” technology classes) can avail of a decreasing tolerance (DECTOL) of up to 100% on a voluntary basis.

### **Run-Hour Limited Capacity**

3.5.9 A voluntary decreasing tolerance (DECTOL) is to apply to generation with emission limitations or run-hour limitations (other than DSU and storage which have separate arrangements) and therefore the Capacity Market Code should be modified as soon as possible to bring this decision into effect.

### **Updated Technology Classes**

3.5.10 In summary, the updated list of Technology Classes applicable for future capacity auctions occurring after the T-1 CY2019/20 auction is shown below in Table 2:

Table 2: Summary of Updated Technology Classes

<b>Technology Class</b>	<b>Units included</b>
Gas turbine	All units with gas turbine as prime mover, i.e. OCGT, CCGT and GT-based CHP
Steam turbine	All units with a steam turbine as prime mover, i.e. coal, oil and peat fired units
Hydro	All hydro units
Pumped storage	All pumped storage units
Other storage	All other storage units, e.g. battery and CAES
Wind	All wind units
Solar	All solar units
DSU	All DSU
Interconnector	All interconnectors

## 4. LONG-STOP DATE AND TERMINATION OF NEW CAPACITY

### 4.1 CONSULTATION SUMMARY

- 4.1.1 In CRM Decision 2 (SEM-16-022), the SEM Committee made two key decisions which were designed to be appropriate for investors making a Substantial Financial Commitment and obtaining a multi-year Reliability Option in a T-4 auction.
- 4.1.2 In SEM-16-022, the SEM Committee:
- Set the Long Stop Date equal to 18 months after the start of the Capacity Delivery Year. The Long Stop Date is the date by which Awarded New Capacity must meet the Minimum Completion, i.e. have delivered 50% of its contracted capacity. If it fails to achieve Minimum Completion by the Long Stop Date, the TSOs terminate its contract and it must pay termination charges.
  - Allowed Awarded New Capacity 18 months after the auction to achieve Substantial Financial Completion. If it fails to achieve Substantial Financial Completion within that timeframe, the TSOs terminate the contract, and may re-tender for alternative capacity.
- 4.1.3 The decisions were intended to apply to investors making a major financial commitment (i.e. one above the New Capacity Investment Rate Threshold) and seeking a fixed price Reliability Option of up to 10 years, in a T-4 auction. However, long-stop provisions with the Capacity Market Code apply to all Awarded New Capacity.
- 4.1.4 In the first T-1 auction (CY2018/19) there was a significant amount of new capacity, predominantly DSU capacity. This capacity was only eligible for a one-year<sup>10</sup> Reliability Option, but has an 18-month Long Stop Date, which puts the Long Stop Date for CY2018/19 after the end of the period for which it is contracted to deliver capacity, which was not the intention of the SEM-16-022 decision, and creates inappropriate incentives.
- 4.1.5 Whilst applying the 18-month deadline for Substantial Financial Completion to a T-4 auction is appropriate, and allows the TSOs some opportunity to remedy non-delivery, shorter timescales for meeting Substantial Financial Completion are required for T-1 auctions, if the TSOs are to have any realistic chance of applying effective remedial action, such as reducing any risk to security of supply.
- 4.1.6 The SEM Committee does not propose to make any changes to the terms and conditions applicable to CY2018/19 T-1 auction winners. However, the SEM Committee is of the view that it will be appropriate to make changes to the terms and conditions in future auctions. The proposal was to have different Long-Stop Dates for one-year contracts and multi-year contracts. The consultation paper outlined the following proposals for a one-year Reliability Option:

- For Awarded New Capacity without a multi-year Reliability Option: to set the Long Stop Date, for units which are not making a substantial financial commitment, to 1 month after the start of the capacity delivery year, effective from CY2019/20; and
- To change the Implementation Agreements for new capacity not making a major financial commitment (i.e. with investment below NCIRT) so that they can be terminated (and termination fees applied) if it does not achieve Substantial Financial Completion before the start of the Capacity Year. The Substantial Financial Completion date was proposed to be set on a case by case basis once the auction timetable is known and the lead time between the contract award and the Capacity Year is fixed. Shorter duration Substantial Financial Completion dates will only apply in T-1, T-2 or T-3 auctions, and only to new capacity awarded a one-year contract.

## 4.2 SUMMARY OF RESPONSES

- 4.2.1 Of those respondents who commented on these proposals the vast majority were in full favour of the proposals. One respondent supported the proposals in principle while another recognised that it was a partial improvement. No respondents disagreed with the need to refine the policy associated with new capacity awarded with one-year Reliability Options in order to resolve the current unintended consequences within the Capacity Market Code.
- 4.2.2 One respondent did not agree that a Long-Stop Date of 1 month provided a participant with appropriate cover and proposed 2 months after the start of the capacity year as being more appropriate.
- 4.2.3 The following general comments were made by a couple of respondents. The risk is not just to security of supply but a risk to other participants as failure of capacity increases the number of occasions when prices exceed the Reliability Option strike price for which participants' bids would not have reflected this higher risk and therefore the capacity market clearing price would be understated.
- 4.2.4 A couple of respondents make specific reference to the procedure regarding the Substantial Financial Completion. While one respondent agreed that the Substantial Financial Completion date should flex with the timing of the auction and urged that the date be communicated as early as possible, preferably the Initial Auction Information Pack, another respondent considered the Substantial Financial Completion proposals to be too loose and a stronger framework is required.
- 4.2.5 One respondent was strongly of the view that an emergency in-year auction is required for the CY2018/19 for capacity that qualified for that auction but lost, particularly given the volume of new capacity awarded one-year Reliability Options within the Dublin area.

### 4.3 SEM COMMITTEE RESPONSE

- 4.3.1 The purpose of the proposals was to address the unintended practical consequences the Long-Stop Date and Substantial Financial Completion within the Capacity Market Code have on future capacity auctions for which new capacity is awarded a one-year Reliability Option. It was not intended to re-open the policy which has already been made with the T-4 auctions in mind (i.e. 18 month period for Long Stop Date and Substantial Financial Completion).
- 4.3.2 While this proposal reflects the experience from the CY2018/19 capacity auction it is not the SEM Committee’s intention to make any changes nor affect the terms and conditions applicable to CY2018/19 T-1 auction winners. Instead the focus of the proposal is on future capacity auctions starting with the transitional T-1 CY2019/20 capacity auction.

### 4.4 SEM COMMITTEE DECISIONS

- 4.4.1 The SEM Committee has decided to have different Long Stop Dates for one-year contracts and multi-year contracts:
- **One-year Reliability Options:** Effective from CY2019/20, the Long Stop Date for a one-year Reliability Option should be one-month after the start of the Capacity Year;
  - **Multi-year Reliability Options:** The Long Stop Date would remain unchanged at 18 months after the start of the Capacity Year.
- 4.4.2 The Substantial Financial Completion date will flex with each capacity auction and will be set separate for each auction.
- 4.4.3 A summary of the decision is provided in Table 3 below:

Table 3: Summary of Long Stop Date and Substantial Financial Completion decision

		RO length	
		1-year	multi-year
Auction	T-4	SFC 18 month after contract award; LSD one month after CY start	SFC 18 month after contract award; LSD 18 months after CY start
	T-1 (or T-2 or T-3)	SFC may be less than 18 months after contract award at SEMC discretion; LSD one month after CY start	SFC 18 month after contract award; LSD 18 months after CY start

SFC= Substantial Financial completion; LSD = Long Stop Date

- 4.4.4 The above decision results in changes to the Capacity Market Code and the RAs will propose a modification as soon as possible to go through the modification process set out in the Capacity Market Code, with a view to being effective for the capacity year 2019/20.

## 5. STATE AID DECISION & AUCTION TIMINGS

### 5.1 CONSULTATION SUMMARY

5.1.1 The CRM T-1 CY2019/20 parameters consultation paper (SEM-18-009) was the first CRM paper to be published following receipt of the EC State aid approval in November 2017 and therefore it included a section outlining the State aid decisions and how they are expected to impact on the capacity market auctions over the next few years. This included a summary of the following areas:

- Locational Capacity Constraints and Auction Format;
- Cross-border participation; and
- Treatment of Demand Side Units (DSUs)

5.1.2 Specifically for this CY 2019/20 the State aid decision allows the inclusion of locational capacity constraints and for the auction format to procure additional capacity for such constraints. However, the State aid decision did specify that CY 2019/20 would be the last capacity auction which could procure additional capacity to satisfy locational constraints and any future capacity auction will have to displace an equivalent MW adjustment of in-merit generation to allow locational constraints to be met, i.e. it can no longer procure additional capacity.

5.1.3 The State aid decision also outlined their expectation regarding auction timings over the next few years and the consultation paper provided stakeholders with an indicative longer term overview for the auction timings going forward.

### 5.2 SUMMARY OF RESPONSES

5.2.1 The consultation paper requested feedback on the longer term overview of future auctions.

5.2.2 All respondents commented on the longer term auction timings and the majority were broadly supportive of the timetable. The points raised by the respondents are captured below:

- Each transitional auction should be completed before holding the first T-4 auction;
- Delay the first T-4 capacity auction to September 2019 or alternatively have an additional T-1 auction for CY 2022/23 and therefore the first T-4 auction would apply to CY 2023/24;
- Some considered the two T-1 auctions in December 2019 as feasible while others considered it sub-optimal and recommended staggering the two auctions e.g. T-1 CY 2020/21 be held in December 2019 and T-1 CY 2021/22 be held in late January 2020;
- Clarity was requested regarding the first full combinatorial auction;
- Requested T-1 auctions be held 12 months or December each year in advance of the delivery year rather than 6 or 7 months suggested in the consultation paper;

- Requested T-4 auctions be held in October rather than September given resource constraints during July/August each year.
- Clarity of specific references within the State aid decision;
- Alignment of T-4 capacity auctions and DS3 volume capped procurement process;
- Concerns regarding timelines to implement State aid changes.
- Cross border participation should apply first to a T-4 auction rather than the corresponding T-1 auction.
- Further auctions should not be progressed pending necessary modifications to generation licences.

### 5.3 SEM COMMITTEE RESPONSE

- 5.3.1 The SEM Committee is keen to progress the capacity auctions with the second transitional auction taking place on 13 December 2018.
- 5.3.2 The first T-4 CY 2022/23 auction is due to take place in March 2019 being the latest it can be held as stipulated by the auction window set out in the Capacity Market Code (T-4 auction can take place between 4 ½ year and 3 ½ years before the start of the capacity delivery year). The T-4 CY 2022/23 Parameters and a separately the T-4 CY 2022/23 Best New Entrant are currently being consulted upon<sup>11</sup>. The detailed T-4 CY 2022/23 auction timetable is due to be published June/July 2018. Any delay to this first T-4 capacity auction would have a significant impact on new capacity and would not be compliant with the Capacity Market Code.
- 5.3.3 The proposal to have the remaining two transitional auctions in December 2019 (CY 2020/21 & CY 2021/22) was to try and address market participants preference for T-1 auctions as soon as possible and given the feedback will consider the possibility of staggering these auctions slightly.
- 5.3.4 The Capacity Market Code provides an auction window of between 13 months and 2 months for a T-1 auction and the SEM Committee has a preference for getting to a position where T-1 auctions settle into being held March each year. Similarly the SEM Committee has a preference for having T-4 auctions in September being 4 years in advance of the capacity delivery year, In both cases we will consider further the feedback received.

<sup>11</sup> T-4 parameters consultation: <https://www.semcommittee.com/news-centre/i-sem-crm-t-4-cy-202223-auction-parameters-consultation>

T-4 Best New Entrant consultation: <https://www.semcommittee.com/news-centre/i-sem-crm-t-4-cy202223-best-new-entrant-consultation>

5.3.5 The EC State aid decision set out their expectations and timelines. The State aid decision envisaged the permanent auction format (full combinatorial auction) be in place for the T-4 auction to be held in 2020 for capacity year 2024/25<sup>12</sup>. A couple of respondents requested clarity of the State aid reference to having four T-1 and four T-4 auctions before 2022<sup>13</sup>. The SEM Committee’s understanding based on the indicative auction timings table provided in the consultation paper is as follows:

Table 4: Indicative Longer term overview of Capacity Auction Timings

<b>Auction Timetable</b>	<b>Capacity Year applicable</b>
December 2017	T-1 CY 2018/19
December 2018	T-1 CY 2019/20
March 2019	T-4 CY 2023/24
December 2019	T-1 CY 2020/21
December 2019	T-1 CY 2021/22
March 2020	T-4 CY 2023/24
September 2020	T-4 CY 2024/25
September 2021	T-4 CY 2025/26

5.3.6 The above table is indicative and is shown here to help elaborate further on the State aid expectation.

5.3.7 Further consideration will be given regarding the implementation of the State aid requirements.

## 5.4 SEM COMMITTEE DECISION

5.4.1 The SEM Committee welcomes the feedback from the respondents on the indicative overview of auction timings and will consider the comments further as the auction timings continue to be developed in line with the State aid decision and the implementation of various aspects of that decision.

<sup>12</sup> Paragraph 47 of the EC State Aid Capacity Mechanism Decision

<sup>13</sup> Paragraph 42 of EC State Aid Capacity Mechanism Decision

## 6. NEXT STEPS

- 6.1.1 The relevant parameter decisions within this paper will be incorporated into the Initial Auction Information Pack due to be published 1 June 2018 in accordance with the T-1 CY2019/20 capacity auction timetable<sup>14</sup>.
- 6.1.2 Progress the refinement to the Long-Stop Date decision and termination of new capacity for awarded new capacity without a multi-year Reliability Option through the Capacity Market Code modification process with a view to the modification being effective for the Capacity Year 2019/20.
- 6.1.3 Progress the policy decision to allow a voluntary decreasing tolerance (DECTOL) to apply to generation with emission limitations or run-hour limitations (other than DSUs and Storage which have separate arrangements) through the Capacity Market Code modification process as soon as possible. Once the modification becomes effective it will apply to future capacity auctions.
- 6.1.4 All SEM Committee decisions are published on the SEM Committee website:

[www.semcommittee.com](http://www.semcommittee.com)

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<sup>14</sup> T-1 CY2019/20 Capacity Auction Timetable: <http://www.sem-o.com/ISEM/General/CAT1920T-1%20-%202019%202020%20T-1%20Capacity%20Auction%20Timetable.pdf>